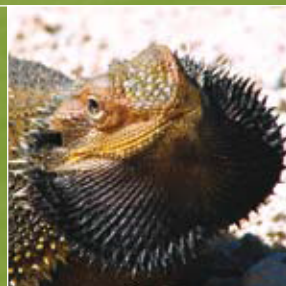
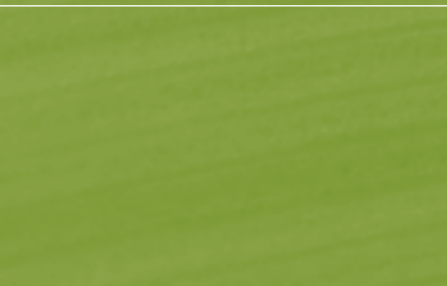


Biodiversity Strategy 2008-14



NATURE CONSERVATION IN
AN URBANISED LANDSCAPE

*'We can either
destroy or we
can cherish –
the choice is
ours.'*

DAVID ATTENBOROUGH



Foreword

Since the Garden of Eden mankind has found serenity in an environment of balanced congenial plant and creature life.

The quality of life in Burnside is enhanced by the many areas where plants and creatures provide us with the experience of nature in harmony.

Preserving and managing these precious assets is the science of biological diversity, or biodiversity.

We can be proud that people come from far away to enjoy our gardens and the beautiful Waterfall Gully. Every soul is enriched by time spent in the atmosphere of tranquillity and nature's artistry in these places.

But in the face of reductions to our biological diversity, there is a pressing need to strengthen conservation activities across Australia.

The City of Burnside Biodiversity Strategy, detailed in this document, provides a clear policy statement about the value and our approach to the City's biodiversity. The Vision 2020 Strategic Plan for the Burnside community provides an overarching vision for the natural environment. One of the key directions in the Strategic Plan is "Our protected and valued environment".

This Biodiversity Strategy addresses policy, conservation and management priorities that have been determined by the community, regulations, international treaties, planning and science. The Strategy builds on the current efforts of Council, governments, community organisations and groups, industry and the many individuals who already positively contribute to the management of our City's natural assets and biodiversity.

The Strategy is part of Council's commitment to working towards an ecologically sustainable future for the City.

The City of Burnside aims to 'lead by example' and to work collaboratively with individuals, community and volunteer groups, federal and state agencies, surrounding councils and other organisations towards the protection, management and restoration of our biodiversity.

We all want to preserve Burnside's biodiversity for generations to come and with this in mind I have great pleasure in commending the Strategy to you.

Wendy Greiner

Wendy Greiner
Mayor of Burnside





Contents

III FOREWORD			
V ACKNOWLEDGEMENTS			
VI EXECUTIVE SUMMARY			
I INTRODUCTION			
2	What is Biodiversity?		
2	Why is Biodiversity Important?		
3	Why Prepare a Biodiversity Strategy?		
4	What Does the Strategy Aim to Do?		
4	Location, Topography and Climate		
11	History of Nature Conservation in Burnside		
17 I. REMNANT NATIVE VEGETATION			
17	Importance for biodiversity		
18	Present Situation		
19	Issues and Recommendations		
23 2. INDIGENOUS TREES			
23	Importance for biodiversity		
24	Relevant Provisions of Tree Management Strategy		
24	Issues and Recommendations		
29 3. WILDLIFE			
29	Present situation		
32	Available Habitats within the City of Burnside		
33	Managing Wildlife Problems		
34	Feral and Domestic Animals		
35	Increasing Habitat for Native Fauna		
37 4. URBAN PLANTED SITES			
37	Importance for biodiversity		
38	Aesthetics		
38	Present Situation		
39	Issues and Recommendations		
41 5. COMMUNITY EDUCATION AND PARTICIPATION			
41	Community awareness of biodiversity		
42	Issues and Recommendations		
45 6. HOW DO WE PROCEED?			
45	Implementing the Burnside Biodiversity Strategy		
49	An ideal Conservation and Land Management program —“A wish list”		
51 7. WHAT FOR THE FUTURE?			
51	Sharing a vision		
53	Recommendations		
55 8. SUMMARY			
55	Summary of recommendations and actions		
63	Appendix 1a—Native flora		
73	Appendix 1b—Introduced flora		
81	Appendix 2a—Birds		
85	Appendix 2b—Amphibia		
86	Appendix 2c—Mammalia		
87	Appendix 2d—Reptiles		
89	Appendix 2e—Insecta		
90	Appendix 3—Biodiversity planning framework		
92	Appendix 4—Resident information about planting local species in Burnside		
93	Appendix 4—Resident information about planting local species in Burnside		
94	Appendix 5—Biodiversity site list		
95	Appendix 6—City of burnside conservation and land management operating guidelines		
98	Appendix 7—City of Burnside biodiversity policies		
100	Appendix 8—Bradley method and its applicability to the City of Burnside		



Acknowledgements

This Strategy has been prepared with the financial assistance of the Adelaide and Mount Lofty Ranges Natural Resources Management Board.

Gratitude is expressed to the many people who contributed to its production. In particular, Council would like to acknowledge, with thanks, the following staff who contributed to the Strategy:

- Andrew Crompton, Group Team Leader Conservation and Land Management
- David Howlett, Team Leader Conservation and Land Management
- Annie Weise, Field Officer Conservation and Land Management (previous)
- Donna Tonellato, Field Officer Conservation and Land Management
- Simon Bradley, Manager Open Space and Recreation
- Kate Hallahan, Our Patch Officer (previous)
- Martin Krieg, Our Patch Officer.

The Open Space and Recreation Department of the City of Burnside prepared this Strategy. Environmental and Biodiversity Services drafted the section on wildlife and provided some additional data. The publishing team from Ecocreative® further developed this draft, also providing design and management services to bring this Strategy to fruition..

Photographs in this Strategy contributed by Ecocreative, Luke Simon Photography and the City of Burnside.





Executive Summary

The City of Burnside is committed to preserving and enhancing the area's biodiversity – the plants, animals, and ecological communities that have survived within the City of Burnside from before European settlement. Although most of the indigenous flora and fauna communities have now been cleared, there are still precious remnants that require protection and maintenance. There are also a variety of opportunities for restoration and enhancement.

Preparation of this Biodiversity Strategy has involved a review of existing relevant documents, compilation of available records of plants and animals, discussions with Council officers, audits and community consultation.

This document includes:

- a summary of international agreements, national and South Australian legislation, policy and programs, catchment strategies and programs, local government responsibilities and powers, activities of relevant non-government organisations, and relevant policies and plans of the City of Burnside
- an outline of Council actions to date
- a profile of Burnside's biodiversity, and the issues and recommendations for improved conservation
- a vision, goals, strategic objectives, performance indicators and targets for biodiversity conservation
- a summary of recommendations to be implemented over time.

For the City of Burnside to follow its vision, a shared picture is needed of what Burnside would look like if it were to continue and advance in becoming a nature-friendly city. The attributes of a nature-friendly Burnside would be:

- a linked reserve system across the hills-face incorporates all ecosystem types and provides a walking and bicycle trail network that is well planned and maintained to enhance natural values and not compete with them
- linked open spaces follow the creeks into the residential areas with creek-lines well vegetated for habitat, water quality and stream stability
- urban parks with areas of restored native forest and woodland
- remnant native trees conserved and regenerating at appropriate sites across residential areas
- native vegetation conserved, established wherever possible and managed to minimise weeds and fire hazard and to maximise conservation of wildlife and rare plant species

- a nature-aware community that provides habitat in gardens, owns pets responsibly and drives with wildlife awareness
- sustainably managed woodlands maintained and extended as an offset for Council's carbon emissions
- a council working cooperatively with community and other levels of government to develop and implement policies and systems to guide the built form towards ecological sustainability.

The action plan deals with the issues under five headings. These are:

1. indigenous trees
2. remnant native vegetation
3. urban planted sites
4. wildlife
5. community education and participation.

There are 83 actions proposed which relate to 8 themes:

- improving our knowledge
- building connected habitat areas
- conservation management
- monitoring
- awareness and education
- fostering partnerships
- legislation and regulation
- systems and processes.



The outcomes of the Biodiversity Strategy will:

- set clear policy direction for the conservation of Burnside's biodiversity
- generate and promote a shared understanding of biodiversity and its values in Burnside
- establish a strategic framework to guide advocacy, research, planning, education and action for the conservation of biodiversity
- provide guidelines for government, Council and community planning and actions
- enhance the integration of biodiversity in key policy, planning, education and management programs
- identify priority short- to medium-term actions.





Introduction

Without its native flora and fauna, Burnside would be indistinguishable from the many suburban areas from which natural systems have been cleared away.

The City of Burnside has a Strategic Plan For the Burnside Community Vision 2020. The Plan addresses four strategic directions. For each strategic direction, there are several desired outcomes and key actions. Of these directions, numbers 1 and 2 are of specific relevance to biodiversity conservation in Burnside, (see Table 1).

This Biodiversity Strategy reviews Council's Conservation and Land Management Program as it has developed over the last ten years and makes recommendations for action that relate to the approaches presented in Vision 2020.





Biodiversity refers to the diversity of life in all its forms across the planet

ecosystems and the ecological complexes of which they are part) and includes:

- (a) diversity within species and between species
- (b) diversity of ecosystems.

WHY IS BIODIVERSITY IMPORTANT?

The values of biodiversity are economic as well as social and cultural.

It is global biodiversity that provides the critical processes that maintain our air, water and soil. As well as conserving global biodiversity, natural areas provide opportunities for recreation, tourism, scientific research and education.

It is the nature of a place that defines that place, and each ecosystem is unique to the place where it occurs. Without its native flora and fauna, Burnside would be indistinguishable from the many suburban areas from which natural systems have been cleared away.

Biodiversity is a source of cultural identity for many Australians. Indigenous people of Australia see themselves more as part of the land rather than owners of it. More and more, the people of non-indigenous ancestry are beginning to view the land in a similar way.

The importance of biodiversity to urban local government is stated by the Australian National University in their website:

A field of growing interest world wide, 'urban biodiversity' seeks to understand how biodiversity promotes and maintains landscape health and human wellbeing through the provision of ecosystem services. With the rapid increase in urban populations worldwide (current estimates by the United Nations estimate that in 2007 over 50%

of the worlds population live in urban settlements, with this figure reaching just over 90% in Australia), the maintenance of sufficient landscapes to maintain ecosystem services in urban settlements is set to provide a challenge for scientists, planners, governments and communities well into this century.

Biodiversity is not, as is sometimes portrayed, a crude count of species present at a location. An essential component of the biodiversity of a location is the interaction of the species to form a functioning and persistent ecological system.

When a naturally occurring species is lost from an area, this is referred to as local extinction. Each local extinction is a step towards global extinction. It is the City of Burnside and the people living here who have the responsibility for ensuring the conservation of biodiversity in the Burnside area.

Biodiversity is not purely about conserving the myriads of life-forms that share the world with humans, it is also about 'ecosystem services' that are of direct benefit to humans. From the conservation and proper management of biodiversity in Burnside will flow the following ecosystem services:

- reduction of water use for landscape maintenance
- protection of creeks from erosion
- improvement of water quality in creeks
- protection of hill slopes from erosion
- reduction of runoff and therefore flood severity
- reduction and control of fire hazard
- long-term carbon sequestration and contribution to climate stability



WHAT IS BIODIVERSITY?

Biodiversity is a contraction of biological diversity. It refers to the diversity of life in all its forms across the planet. It includes the species that make up life on Earth as well as the genetic diversity contained within each species and the ecological systems that are formed by these species as they adapt and interact with other species and the non-living components of the environment.

The following definition is taken from the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth):

biodiversity means the variability among living organisms from all sources (including terrestrial, marine and other aquatic



The City of Burnside and its residents have the responsibility for ensuring the conservation of biodiversity in the Burnside area

- control of pests (bats eat mosquitos; snakes eat mice; parasitic wasps control garden pests etc)
- self-regenerating landscapes which do not need replanting
- provision of interesting landscapes for walking, observing and photographing
- a sense of place.

Since 1995, Council has specifically included biodiversity as a heading for environmental policy. These policies are still current and are presented in Appendix 7.

This local Biodiversity Strategy relates our present policies and programs to the existing State and local policy framework and proposes actions for Council's consideration.

WHY PREPARE A BIODIVERSITY STRATEGY?

Loss of biodiversity was recognised in the first national *State of the Environment Report* (State of the Environment Advisory Council 1996) as Australia's most important environmental problem.

There are a number of international conventions and agreements relating to the protection of biodiversity, as well as Commonwealth and South Australian legislation and strategies. The development of strategic plans by Local Government to conserve and enhance their biodiversity assets is encouraged in the *National Local Government Biodiversity Strategy* (Australian Local Government Association 1998).

This Biodiversity Strategy has been prepared to set the future management direction for the protection and enhancement of biodiversity within the City of Burnside.

The City of Burnside already undertakes many initiatives that relate to protecting and enhancing the environment. However, there is a need for a more strategic approach to ensure that we are providing the best possible outcome for the environment of Burnside. The Strategy ensures that Council is best able to meet its statutory obligations and community expectations regarding biodiversity protection, and to ensure that our biodiversity is protected for future generations.

Benefits of biodiversity may be found across various areas:

Ecological and ecosystem services

- cycling and filtration processes (breakdown of wastes, soil formation, clean air/water, nutrient cycling)
- translocation processes (seed dispersal, pollination)
- stabilising processes (weather, climate, geomorphic processes, hydrologic regulation, salinity control, control of pest species)
- food and habitat for local fauna
- less intervention (e.g. herbicides) required

Preservation of opportunities

- genetic capital
- natural capital

Cultural and recreational

- Indigenous values
- intellectual and spiritual inspiration
- ethical values
- aesthetic values
- scientific and educational values
- local character and sense of place
- recreational value
- heritage value.

TABLE 1: COUNCIL'S STRATEGIC DIRECTIONS RELATED TO BIODIVERSITY

Strategic Direction No. 1 is:

Our integrated living form and living spaces

This Strategic Direction has one desired outcome of direct relevance to biodiversity conservation.

DESIRED OUTCOME:
A CONNECTED SYSTEM OF OPEN SPACES THAT ARE WELL DESIGNED AND MAINTAINED

APPROACH:
(A1) create linkages between open spaces
(A2) maintain and improve the amenity, aesthetics and environmental benefits of open space

Strategic Direction No. 2 is:

Our protected and valued environment

This Strategic Direction has two desired outcomes of direct relevance.

DESIRED OUTCOME:
NATURAL ENVIRONMENTS AND WATERCOURSES PROTECTED AND CONSERVED

APPROACH:
(A3) protect and improve local native vegetation and habitat
(A4) reduce the impact of urban development on natural areas and the Hills Face
(A5) control and minimise bush fire risk
(A6) protect and improve water quality in creeks

DESIRED OUTCOME:
SUSTAINABLE USE OF WATER, ENERGY AND NATURAL RESOURCES, AND THE MINIMISATION OF WASTE

APPROACH:
(A7) reduce mains water use

WHAT DOES THE STRATEGY AIM TO DO?

The Strategy aims to:

- set clear policy direction for the conservation of Burnside's biodiversity
- generate and promote a shared understanding of biodiversity and its values in Burnside
- establish a strategic framework to guide advocacy, research, planning, education and action for the conservation of biodiversity
- provide biodiversity input into Council and community plans and operations
- identify short-to medium-term priority actions

- enhance the integration of biodiversity in key policy, planning, education and management programs.

The recommendations and actions have been proposed to achieve these outcomes. Many of the proposed actions will need further development following an appropriate level of public consultation.

Whilst Council endorses the philosophical and policy framework proposed in this strategy, it recognises that implementation will be subject to current budget constraints and priorities.

LOCATION, TOPOGRAPHY AND CLIMATE

The City of Burnside is a municipality to the east of the City of Adelaide and is part of the Adelaide metropolitan area. It consists of relatively densely settled suburban areas on the gentle sloping plains and more sparse settlement in the steeper hills face areas in the eastern part of the Council area. In 1856, the Burnside District Council was established in what is now the suburb of Burnside. Since then, the District has become a city with 28 suburbs and a total population of 42,500.

The northern part of the City of Burnside is located in the River Torrens water catchment area. The main watercourses within this catchment are:

- First Creek flowing out of Waterfall Gully
- Second Creek flowing out of Slapes Gully, with its tributary Stonyfell Creek flowing out of Gandy's Gully
- Third Creek near the northern boundary of the City of Burnside (about 100m in Burnside).

These creeks are perennial in their upper reaches.

The southern part of the city is in the Patawalonga Catchment. The only creek of note in the Burnside part of this catchment flows intermittently from Gully Reserve at Mt Osmond and is now an underground stormwater system which leads to the Glenside stormwater basin. From here it flows into the South Park Lands of the City of Adelaide where it is known as Park Lands Creek. Many other minor watercourses in the Patawalonga Catchment are not named and only exist as open channels in the upper parts of the catchment. An example is the creek that flows through Beaumont Common.

Soils of the plains are derived from alluvial deposits washed from the Adelaide Hills. They are mostly deep clays with some areas of lighter and stony soils associated with historical locations of creek beds. In the hills face, the texture of the soil reflects the nature of the bedrock from which they are derived. They are mostly shallow loams over weathered shale. Most of the sub-soils are slightly to strongly alkaline.

In the Stonyfell area, there are areas of quartzite bedrock which weathers slowly and develops shallow skeletal acid soils. This explains the location of quarry industries in the area and the presence of heathy (low, hard-leaved) native vegetation.

Although the City of Burnside has little remaining intact native vegetation, there are significant areas of good quality natural habitat to the east (Horsnell Gully Conservation Park, private quarry land and Cleland Conservation Park) and to the south (Waite Hills).

An area of Cleland Conservation Park near the first waterfall is within the boundaries of the City of Burnside. The more elevated parts of this area contain diverse native vegetation. This vegetation occurs in soil and microclimatic conditions which are different to the rest of the City. Because it is entirely within a conservation park the biodiversity of this area has not been included in this report.

Chambers Gully Reserve (off Waterfall Gully) is owned and managed by the City of Burnside although it is within the Adelaide Hills Council area. For the purposes of this report it is considered to be a part of the City of Burnside.

The climate is Mediterranean with most of the rain falling in winter and spring. Summers are hot and dry although storms occasionally produce short periods of intense rain. As is common in Australia, the climate varies markedly from year to year.



Dominant land uses

Residential

The City of Burnside contains 19,840 residential properties, which is by far the dominant land use. The City of Burnside is recognised as a city of wide, leafy streets, with a range of period houses that has formed a unique character over time.

Recreation

The City of Burnside is noted for its diverse range of parks and reserves. These parks and reserves include active and passive recreation facilities such as playgrounds, sporting ovals, tennis courts, swimming pools, recreation trails, and picnic facilities. Many reserves contain remnant or revegetated indigenous vegetation.

There are a total of 193 hectares of parks and reserves within the City (6.9% of the total area of the City). There are 103 hectares (3.6%) of reserves in the hills face towards the eastern boundary of the City. The area is generally fairly rugged consisting of steep

slopes, gullies and scarps. There are about 14 kilometres of creek line in Burnside, of which 500 metres is currently being rehabilitated by Council. There are about 14 kilometres of fire tracks and walking trails in Council reserves available for public access.

There are approximately 35 hectares (2.5% of total area of the City) of parks and reserves owned and managed by the State Government.

In Burnside's parks and reserves, there are about:

- 120 surviving indigenous plant species
- 20 species with conservation rating for the South Mt Lofty Botanical Region (these are rare for the whole Fleurieu Region, not just locally)
- 100 indigenous species which are locally threatened (these are species which have been severely impacted by urbanisation and cannot be expected to survive in Burnside for another 50 years without an improvement in habitat)
- 60 indigenous species that have been

propagated and reintroduced to projected sites

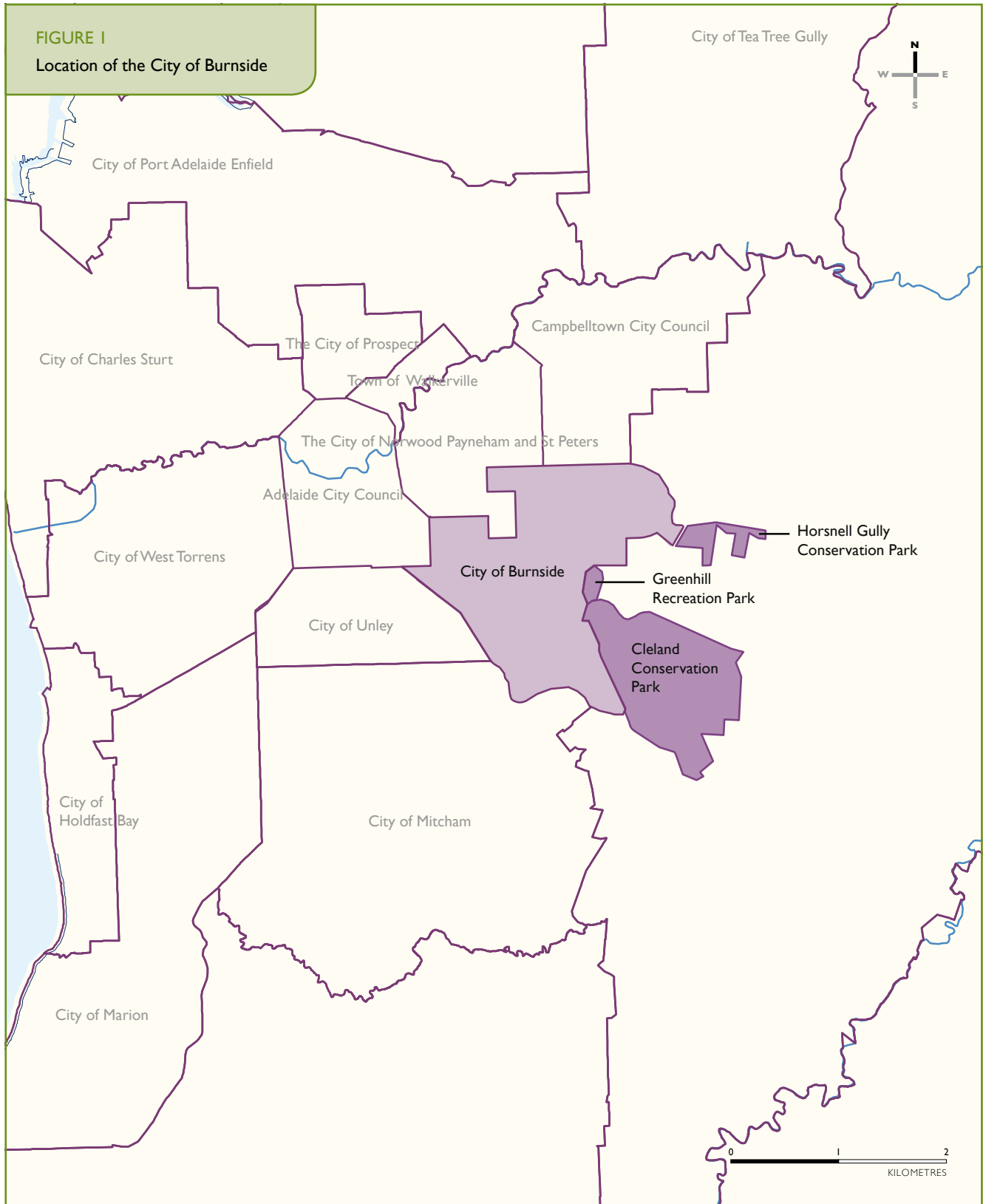
- 20 species that have so far been observed to regenerate in restoration sites (natural regeneration is a key performance indicator for ecological restoration projects)
- 110 invasive introduced species.

In Burnside's 103 hectares of Hills Face Reserves:

- 2 hectares of indigenous vegetation in good to very good condition
- 8 hectares of native vegetation in moderate condition
- 20 hectares of native vegetation in poor condition
- 70 hectares of very degraded land with only scattered indigenous flora
- 95 hectares of steep or very steep topography
- 15 hectares with at least primary weed treatment
- 20 hectares slashed annually for fire hazard reduction.

FIGURE I

Location of the City of Burnside



Policy context

The importance of conserving native (indigenous) flora, fauna and their habitats has been recognised in international agreements, legislation at Commonwealth and State levels, and a variety of strategies and programs at all levels of government. In addition, a number of non-government organisations have biodiversity programs. Biodiversity conservation in the City of Burnside should recognise and support these initiatives, and work within the strategic frameworks already established. Items of particular relevance to Burnside are highlighted below. A complete list of existing strategies, plans, legislative requirements and agreements that address biodiversity conservation at all levels of government is provided in Appendix 3.

International agreements

International treaties, conventions and agreements to which Australia is a signatory are of special importance for the protection of fauna, flora and biodiversity generally. They provide a context for federal and state legislation. These agreements are not binding on local government itself. However, they demonstrate Australia's commitment to conserving biodiversity as a global resource.

Australia is a signatory to the *International Convention on Biological Diversity* (1992), which originated in the United Nations Conference on Environment and Development (also referred to as the Earth Summit or the Rio Summit) held in June 1992. Of relevance to local government is the Local Agenda 21. Chapter 28 of Agenda 21 notes the pivotal role of local government in fulfilling the objectives of sustainable development:

Local authorities construct, operate and maintain economic, social and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and sub-national environmental policies. As the level of governance closest to the people, they play a vital role in educating, mobilising and responding to the public to promote sustainable development.

This international framework was the basis for environment planning and action in Burnside in the mid 1990s.

In addition, the habitats of birds that migrate annually between Australian and Japan or China are protected under the *Japan-Australia Migratory Bird Agreement* (1974) and the *China-Australia Migratory Bird Agreement* (1986).

National legislation, policies and programs

The *Environment Protection and Biodiversity Conservation Act 1999* establishes processes for listing and protecting threatened species, and requires the assessment and approval of any proposed action that is likely to have a significant impact on a matter of national environmental significance. These matters include nationally threatened species and communities, and migratory species protected under international agreements.

The *National Strategy for the Conservation of Australia's Biological Diversity* (1996) provides a framework for federal and state government biodiversity protection activities.

The *National Local Government Biodiversity Strategy* is a local government initiative adopted unanimously at the National Assembly of Local Government in 1998.

Identifying the need for a clear and cooperative partnership arrangement between all levels of government and the community, this Strategy is designed to address the national biodiversity conservation agenda at the regional and local levels. It recognises that natural resource management is best achieved at the local level, and that biodiversity conservation is a logical extension of the planning and development control functions carried out by local government.

Important principles underlying the *National Local Government Biodiversity Strategy* are:

- Biodiversity protection and management is a core function of local government.
- Local Councils should cooperate to develop biodiversity plans at a regional level.
- Biodiversity conservation should be incorporated in local planning instruments.
- Regulatory controls should support a program of education and incentives.
- Biodiversity conservation should be implemented in a way that maximises community support and efficiently delivers quality outcomes.
- Training, access to information and appropriate professional staffing at the local level should be increased.

The Commonwealth, State and Territory governments committed themselves in 1997, through the Natural Heritage Trust, to reversing the long-term decline in the quality and extent of Australia's native vegetation. The *National Framework for the Management and Monitoring of Australia's Native Vegetation* (1999) notes the role of local government.

The National Heritage Trust provided funding to help set up the Biodiversity Program

in Burnside in 2000 to 2003. The NHT has now been replaced by the Caring for Country program which targets projects of national significance. It is doubtful if this will be relevant to the City of Burnside.

The Australian State of the Environment report 2001 recommends 65 environmental indicators for biodiversity at the national scale. They relate to pressures on biodiversity, condition of biodiversity, and responses to loss of, or perceived threats to, biodiversity.

State government

The South Australian Strategic Plan lists biodiversity as a key focus for environmental protection. It states:

South Australia must be world renowned for being clean, green and sustainable. This will boost community wellbeing, safeguard future generations and contribute to our State's prosperity. The focus will be on protecting our biodiversity, securing sustainable water and energy supplies, and minimising waste.

Flowing from the State Strategic Plan is the State Biodiversity Strategy *No Species Loss: A Biodiversity Strategy for South Australia 2006–2016*. This strategy presents:

a set of objectives, targets and recommendations of relevance to communities and resource managers at regional and local levels, and to regional natural resource management boards. It recognises that these objectives are much more likely to be met if a modern legislative framework and a complementary suite of policy mechanisms is in place.

The State Biodiversity Strategy is aimed at halting the decline of biodiversity through



the implementation of a number of goals and targets. Targets that directly address biodiversity decline across the state include:

- protection of 80% of South Australia's regional ecosystems
- management of threats to biodiversity
- identification of ecological communities in decline
- decline in threatened species and ecological communities is halted
- recovery plans implemented for 100% of South Australia's endangered and vulnerable threatened species
- conservation of 60% of South Australia's endangered and vulnerable threatened plant species in situ.

It is anticipated that the objectives developed in the City of Burnside Biodiversity Strategy will be consistent with the goals and targets relating to biodiversity conservation highlighted within the *No Species Loss* report.

Local government

Local government has a number of core functions that have a direct impact on native vegetation and biodiversity, including land use planning, development control, managing land, and managing environmental risks. Local government leads by its action, and is also able to facilitate community involvement, operate grant and incentive programs, and provide financial and administrative support to encourage biodiversity conservation.

The *National Local Government Biodiversity Strategy* encourages commitment to, and the development of, biodiversity policies by Councils. The Strategy's central aim is for biodiversity management to be a core function of local government, subject to adequate funding and resources.



City of Burnside policies and plans

The *Vision 2020 Strategic Plan* for the Burnside community provides an overarching vision for the City and its natural environment. The provisions of this Strategic Plan that are relevant to biodiversity conservation and management are outlined on *page 2* of this report. Prior to the development of the *Vision 2020 Strategic Plan*, biodiversity policy and practice was guided by:

- *Enviroplan* 1994
- *LA21 Plan* 1995
- *Hills Face Reserves Management Plan* 1995
- *Mount Osmond Reserves Action Plan* 1996
- *Open Space Strategy* 1996
- *Significant Tree and Vegetation Study Report* 1997
- *Biodiversity Action Plans for Council Land* 1997
- *Specific policies for Biodiversity* 1997
- *Community Land Management Plans* 2004.

This Biodiversity Strategy details the strategies that flow from the *Vision 2020 Strategic Plan* and is complementary to the *Open Space Strategy 1996*, *Tree Management Strategy 2006* and the *Walking Trail Network Strategy* (not yet endorsed by Council).

The City of Burnside's *Open Space Strategy* is underpinned by the following principles:

1. Preservation and conservation

Open space should be retained and conserved in order to preserve Burnside's natural and cultural heritage for the enjoyment and benefit of present and future generations.

2. Aesthetic and amenity value

Open space should be valued for the sense of tranquillity it offers, for appreciation of nature, for visual relief in built-up areas, and as a source of inspiration and spiritual refreshment.

3. Provision of diversity and quality

The quality and range of open space settings (from normal playing fields to natural bushland) is the key to ensuring increased and more satisfying leisure opportunities, and enhanced amenity for residents and visitors of all ages.

4. Equity of access

Ideally, open space and the benefits, that derive from open space, should be evenly distributed and accessible to all. In terms of proximity, a small pocket park within 500 metres of each house has been the suggested goal.

These principles relate to all types of open space and are relevant to biodiversity principles.

The creation of strategies to nurture and maintain Burnside's parks and reserves is an obligation under the *Local Government Act* and biodiversity is a vital part of this responsibility. This Act introduced the concept of 'community land' and nominated councils to be custodians of land for the benefit of current and future generations of the community. Section 193 of the Act defines community land as: 'All government land (except roads) that is owned by a Council or under the Council's care, control and management.'

Burnside recognises community land as an important component of the urban environment, providing space for leisure and recreation activities. It is a requirement that councils have a *Community Land Management Plan (CLMP)* for any community land that they own. A CLMP identifies an area of land as a community facility, and provides authority to control the future uses, development and maintenance of that land. It aims to balance the preservation of the unique features of the site with community needs for open space recreation facilities.

Burnside's CLMP establishes strategic approaches and clear objectives for the management and maintenance of Burnside's parks and reserves; clarifies direction, both to Council staff and the general public; and assists Council to assign priorities in budgeting and works programming. A 'Foothills and Hills Face Reserves' CLMP was prepared in 2004.

Relationship to other Council strategies and plans

Biodiversity is influenced by Council actions across a range of policy and program areas:

- planning
- community services
- parks and gardens
- fire prevention
- walking trails
- conservation and land management
- council purchasing.

All these areas need to be considered in biodiversity management. Conversely, biodiversity also needs to be considered when deciding on actions in these areas.

Relationship with other agencies

Many organisations, from the international level down to the neighbourhood level, interact with the City of Burnside in the management of biodiversity.

Federal government

Burnside has benefited from Natural Heritage Trust funding to assist with setting up the Biodiversity Program in 1999 and with staff training.

State government

There are several state government programs that directly assist the City of Burnside with the improvement of biodiversity.

- **Adelaide and Mt Lofty Ranges Natural Resource Management Board** funds a regional 'Our Patch' Officer who is hosted by the City of Burnside. The Our Patch program involves several primary schools and community groups in Burnside in the development of four 'Our Patch' sites. The program also provides some grant funding to assist with management activities that cannot be performed by volunteers. The Board is also developing a regional NRM plan. Local government is vital to the successful delivery of many of the Board's programs.
- **Urban Forest Biodiversity Program** aims to promote the conservation of bushland areas in metropolitan Adelaide. Council has applied for and received grants from this program for rehabilitation of native vegetation in one Hills Face Reserve and three areas of urban remnant native vegetation.
- **Metropolitan Open Space Fund of Planning SA** has provided Council with funding to help purchase land for Young Park at Magill. The fund also approved

support for the purchase of a strategic parcel of land at Mt Osmond in 2001, which was withdrawn from sale. This fund could be accessed should Council wish to purchase substantial areas of land to improve the reserve system in the Hills Face.

- **National Parks and Wildlife Service** is the manager of two Conservation Parks within the City of Burnside and several areas of park or reserve adjoining Burnside. Although Council receives no material support from this organisation, their cooperation has been valuable in the management of Hills Face Reserves at Mt Osmond.
- **Sustainable Landscapes project** is a private/public partnership based at the Adelaide Botanic Gardens. The program aims to promote sustainability of landscape practice. While not specifically aimed at conserving biodiversity, the methods being researched will have a positive benefit for biodiversity.

Non-government organisations

- **Conservation Volunteers Australia** organises groups of volunteers who assist with walking trail construction and general weed management work in Hills Face Reserves.
- **Trees for Life** organises volunteers through its Bush for Life program who carefully manage native vegetation at seven sites in the Hills Face and at one urban site.
- **Greenfleet** is paid by the City of Burnside to plant trees for carbon sequestration to partly offset the emissions produced by the Council's fleet of vehicles. Greenfleet states that all plantings are local native flora species planted at appropriate locations. Given this, Greenfleet is providing a benefit for biodiversity.

Local government

Council staff participate in the Local Government Biodiversity Officers Network which is an information sharing forum for staff of local Councils, and agencies that work with Councils in the area of biodiversity management. This forum works to improve the standard of knowledge and work performance among managers of habitat and native vegetation. As the membership consists only of practitioners, it tends to have little influence at a higher level.

Local government environment officers in the eastern region have also been working together on drafting environment policies that could be applied in local government across the eastern region.

HISTORY OF NATURE CONSERVATION IN BURNSIDE

The pre-European landscape

Prior to European settlement, all of the area now comprising the City of Burnside was covered in woodland and forest of various types determined by the soil, topography and management. The land was managed by the Kaurna people, who set fire to areas of woodland in autumn to encourage grass growth and to maintain an open landscape.

The main pre-European habitat types are shown in Figure 2. These habitat types include:

Grey Box grassy woodland

- associated mainly with the Patawalonga catchment
- dominated by Grey Box (*Eucalyptus macrocarpa*) with associated SA Blue Gum (*Eucalyptus leucoxylon*) and Native Pine (*Callitris gracilis*)

- various other tree and shrub species with density depending on fire regime
- shrubby/grassy/herbaceous understorey on plains, with some heathy character on Hills Face
- occurring on higher nutrient soils, often clays of alluvial origin.

River Red Gum/SA Blue Gum open forest

- associated mainly with the Torrens catchment
- mix of River Red Gum (*Eucalyptus camaldulensis*) and SA Blue Gum (*Eucalyptus leucoxylon*) determined by distance from water
- other tree and shrub species
- occurs on alluvial soils
- grassy/herbaceous understorey.

River Red Gum woodland of hill country

- associated with hill slope areas with perched watertables in Chambers Gully
- grassy/herbaceous understorey
- associated tree and shrub species depending on fire regime.

SA Blue Gum woodland

- occurs on well-drained hill tops and gentle slopes across the Hills Face
- grassy understorey generally with heathy character on lower nutrient soils in Stonyfell.

Mallee Box woodland

- occurs on hill-slope country with alkaline subsoils in Skye and Auldana
- herbaceous/grassy understorey.

Sheoak woodland

- occurs on steep, particularly north and west, slopes throughout the Hills Face
- herbaceous/grassy understorey.

Manna Gum woodland

- occurs on south-facing slopes and moist places in the Hills Face
- herbaceous/grassy understorey.

Native Pine woodland

- small areas scattered throughout the district
- herbaceous or semi-sclerophyllous understorey.

Brown Stringybark heathlands

- occurs on skeletal soils over quartzite, only in private quarry land
- sclerophyllous vegetation type.

Riparian vegetation

- vegetation of watercourses
- composition depends on water regime.

Bogs and Reed beds

- areas with permanently wet soil
- best remaining example is Waterfall Gully Reserve.

Making the Urbanised Landscape The suburbs

The City of Burnside lies wholly within the Hundred of Adelaide, surveyed soon after European settlement in South Australia in 1836. At the time, the Adelaide Parklands were considered to be an adequate provision of public open space and no land within what is now the City of Burnside was reserved for recreation. The idea of reserving land for nature conservation was not to appear for another 50 years. The public open space system that now exists in Burnside has developed through philanthropy, public purchase, and more recently as a result of legally mandated open space allocations as a part of the subdivision of land.

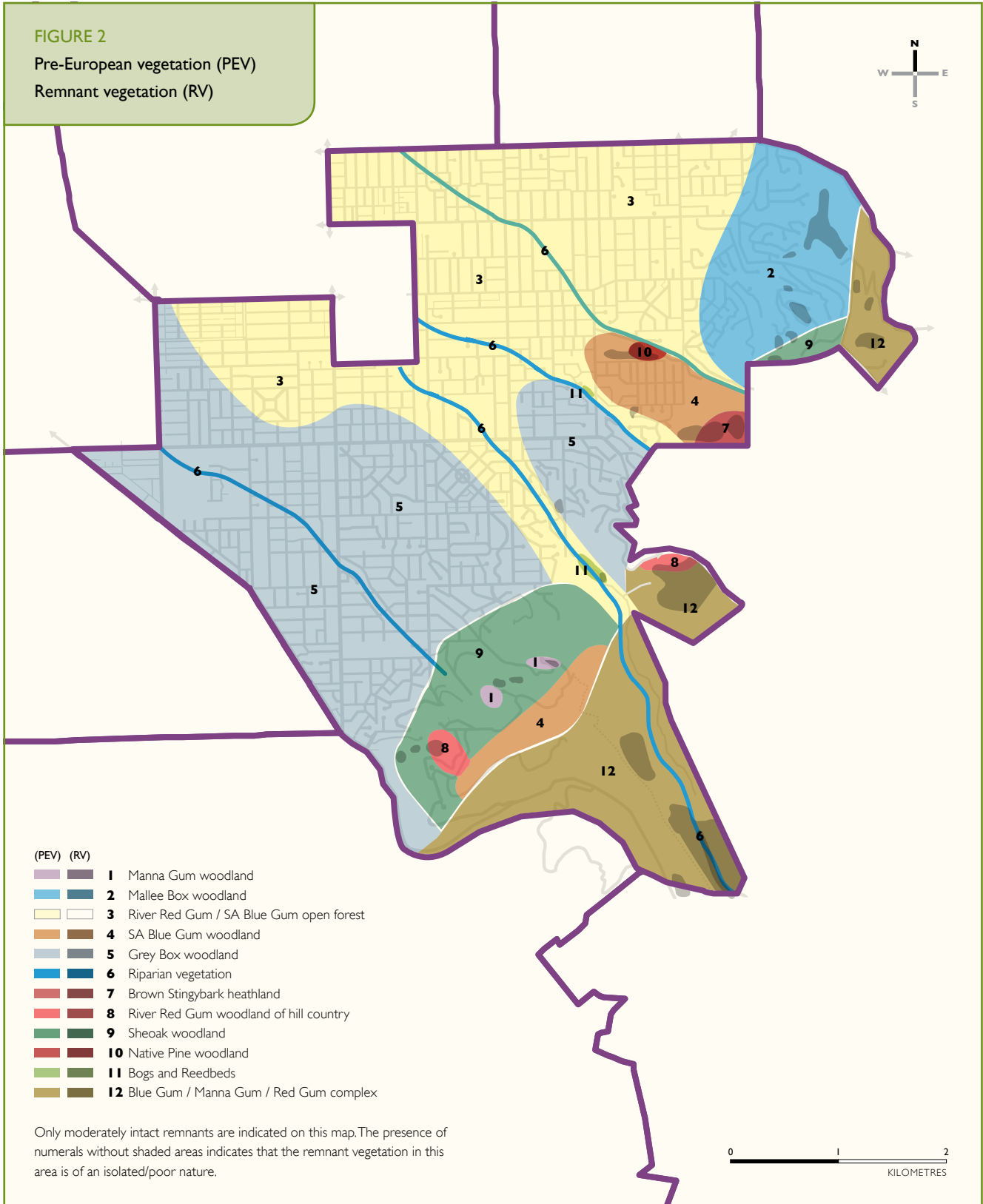
At the time of European settlement, the system of indigenous flora and fauna, managed by the Kurna people, had operated as it had done for many millennia. There was no influence from introduced plants and animals. Soon after settlement, the whole of what is now the plains area of Burnside was sold to settlers as farming land and the process of clearing the trees and ploughing the land began.

By 1856, the time of the first Burnside Council, the landscape of the district had changed radically to become an open farming landscape with some wealthy estates and the small village settlements at High Street, Burnside, at Magill and at Dulwich. Remnants of the original forests and woodlands remained in grazing paddocks, where owners did not fully clear their properties and where the land was too steep or infertile for farming. Many of the original small native plants persisted on roadsides throughout the District but were gradually out-competed by newly introduced pasture plants or plants that had escaped from cultivation in gardens. The picture of land settlement in Burnside and the destruction of the native flora is explored by Warburton (1981) and Kraehenbuehl (1996).

From early in the 20th century, suburban development began to spread eastwards from Fullarton Road, reaching Stonyfell and Skye in the 1960s, Auldana in the 1970s and upper Burnside in the 1980s and 90s. By the end of the 20th century, few larger properties remained to be developed and the remaining undeveloped land in Burnside was in the Hills Face Zone where subdivision is prohibited.

FIGURE 2

Pre-European vegetation (PEV)
Remnant vegetation (RV)



As suburban development progressed, not all of the large private properties were developed. Some, due to the philanthropy of the owners and the support of the local population, state government and Council, were retained as open space. Hazelwood Park, Kensington Gardens Reserve, Kensington Park Reserve and Beaumont Common all became Council reserves and Ferguson Conservation Park became state government land. It is interesting that nature conservation was the sole reason for Effie Ferguson's bequest of what is now Ferguson Conservation Park and that the transfer of Hazelwood Park from the state government to Burnside Council was on the condition 'that it's natural beauty and character – particularly any natural flora and fauna established there – be developed and fostered' (Warburton 1981, p. 334).

As opportunities for large-scale residential development have diminished, the focus of urban planning has been the redevelopment of existing residential allotments to yield anything from two to several allotments depending on the size of the property being redeveloped. This further reduces habitat as informal gardens are often replaced with formal and clipped mass-produced landscapes. Development is also continuing in the foothills on steep allotments that had hitherto been prohibitively expensive to develop. Development of these sites continues to lead to a loss of habitat.

Today, the only remaining native bushland of any size and quality in the suburban areas of Burnside is Ferguson Conservation Park (8 ha). Much smaller areas are conserved in the newly-formed Heatherbank Nature Reserve (0.32 ha) and Young Park (0.2 ha). Other remnants in the suburban areas are all

very small and degraded. Two remnants on private land are of sufficient importance to warrant efforts being made to incorporate these into the Council reserve system. Through the work of Council's conservation and land management program, there are now many places where native flora has been restored or reintroduced to suburban areas.

Hills Face

Hills Face refers to the legally defined 'Hills Face Zone'. In this area further subdivision is prohibited and there are large areas of undeveloped land comprising native woodlands (Skye) or former grazing land (Mt Osmond).

The Mt Osmond area was used from the earliest times of European settlement for grazing, mining and woodcutting with residential development of the flatter land near the top of Mt Osmond taking place in the 1960s. With the removal of grazing from the 1970s, land at Mt Osmond has become seriously infested with woody weeds. Council over the past few years has allocated resources to improve the management of reserve land in the Mt Osmond area.

Although very degraded, a large number of native plant species still survive in the Hills Face reserves of Burnside and there is habitat for a range of native animal species including Kangaroo, Koala, Echidna as well as many birds and reptiles.

Figure 3 shows the areas where relatively intact native vegetation still remains in the City of Burnside.

Creeks

The suburban areas of Burnside are built almost entirely on land which has historically been floodplain. Historically, the creeks were free to meander over the plains, building up what is effectively a giant alluvial fan. With grazing came the destruction of riparian vegetation as well as increased run-off. Stream-bed deepening and bank erosion began soon after European settlement. With residential development came another increase in run-off and a greater imperative to prevent creeks from flooding during high rainfall periods. Engineering works for flood mitigation and stream stabilisation have been a part of Council works programs for many years. Over the last 10 years, native riparian flora has been used to assist with stabilisation and water quality improvement.

Biodiversity policy and practice: 1992 to 2007

The formal consideration of biodiversity by Burnside Council began in 1992 with the formation of the Burnside Environment Advisory Committee and the appointment of an Environment Officer. The following are the main policies that have led to the development of the present Conservation and Land Management program in Burnside:

- the Hills Face Reserves Management Plan (1994)
- the Burnside Enviroplan (1995)
- the Significant Tree and Vegetation Study which incorporated the Biodiversity Action Plan for Council land (1998)
- the 2020 Vision Strategic Plan (2006).

Budget allocations by Council since 1999 have allowed for the establishment of the Conservation and Land Management Team based at the Council nursery. The team maintains and develops the natural environment in Burnside.



Since 1999, the City of Burnside's Conservation and Land Management Team has been the South Australian leader in urban biodiversity conservation practice. There are now 50 sites – reserves or parts of reserves – where native flora is being conserved or re-established (see Appendix 5). The Conservation and Land Management Team is part of the Open Space and Recreation Department at the City of Burnside.

The team has demonstrated that local natural environments can have a place in an urban setting with resulting benefits for water use efficiency, water quality, education

and aesthetics. Points of innovation have been:

- practices for the elimination of weeds from urban sites
- development of ecological function in urban sites
- management for aesthetics in an urban setting
- use of urban sites for ex-situ conservation of rare local species
- establishment of weed-free native riparian vegetation.

Competing and complementary objectives are taken into account during all management planning and implementation.

These are: fire hazard reduction, water use reduction, maintaining aesthetics, preservation of views and public safety.

In urban areas, the conservation of remnant indigenous flora provides us with an ongoing reference point for the original flora of Burnside and it provides sources for propagation of rare local flora. Using local flora in parks and reserves will maximise habitat for local wildlife and reduce dependence on inputs of imported soils, irrigation, fertiliser, and mowing. The use of local flora will be particularly relevant to implementing Council's water use reduction strategy.



In the Hills Face reserves, maintained indigenous flora has a lower flammability than weed-infested areas. The philosophy of developing managed native flora in the Hills Face with fuel reduction boundary buffers was adopted following the Hills Face Reserves Management Plan of 1994.

People need to experience natural areas to appreciate them. Walking trails and interpretation are part of the work of the Conservation and Land Management program. Walking trails also provide access for management operations. There is demand for other recreational usage in Hills Face reserves and these can conflict with conservation objectives. While serious thought needs to be given to the establishment of sustainable bicycle trails, the steepness and fragility of the landscape means that catering for motor-bikes and horse-riding is not appropriate for reserves in Burnside.

Local, or 'Burnside', flora are those indigenous plants that occur naturally in Burnside. When these are propagated, only seeds sourced from Burnside are used unless the remnant population is small and additional source plants are needed to maintain genetic diversity. Species which probably once occurred in Burnside and have a use in our natural areas are propagated from sources close to Burnside. Records are kept of all plantings. Seeds are collected from as many parent individuals as possible to maximise genetic diversity.

The Conservation and Land Management Program includes the following work:

- conserving and managing remnant native vegetation
- establishing and maintaining indigenous vegetation at appropriate urban sites
- collecting seed and cutting material
- rescuing local flora from development sites
- propagating local flora
- managing the nursery for propagating local plants
- developing and maintaining the walking trail network
- maintaining, protecting and repairing minor infrastructure
- liaising with other Council staff and contractors
- attending to residents' requests related to biodiversity on council land
- providing advice to residents regarding biodiversity and land management
- keeping records.

Audit standards for each of these task areas are presented in Appendix 6.

Only a fraction of the possible Conservation and Land Management works can be carried out with the resources available. Priorities are determined according to biodiversity value, site quality, site availability and public profile.



1. Remnant native vegetation

Native vegetation in good condition not only provides habitat for wildlife – it provides ecosystem services of direct benefit to people.

IMPORTANCE FOR BIODIVERSITY

Intact native vegetation represents the outcome of many thousands of years of evolution at a place. The interaction of thousands of species of organism with their environment creates a system that cannot be replicated by planting.

Native vegetation in good condition not only provides habitat for wildlife – it provides ecosystem services of direct benefit to people.

The majority of biological diversity is near the ground and below ground. It consists of species and interactions that are not obvious. Many native plant species have specialised site requirements and cannot readily be cultivated in garden situations. Their continued existence in Burnside is dependent on the maintenance of natural habitats for them. Most species of native animals are also specialised and require the right mix of shrubs, grasses and smaller plants for their essential habitat requirements.





Until recently, native vegetation in Burnside survived only by chance rather than through good planning

- Ferguson Conservation Park, about 4 ha
- Heatherbank Reserve, about 0.2 ha
- Langman Reserve, about 1 ha
- Young Park, about 0.1 ha
- two small patches in private property
- individual specimens that have by chance survived.

The allocation of land for nature is the critical issue for biodiversity in the urban areas of Burnside, as it is for urban areas around the world. Whilst Colonel Light may have had considerable foresight in planning for the Adelaide Park Lands, this foresight was not continued in the planning of the rest of metropolitan Adelaide. This can be contrasted with the metropolis of London, England, where large areas of open space called Countryside Parks include canals, lakes, marshes, hedgerows, woodlands and meadows in close proximity to residential areas. As a result, London hosts a large percentage of the native birds of Britain, as well as a human population that is much more aware and supportive of local nature. As an example see London Borough of Ealing *Biodiversity Action Plan*.

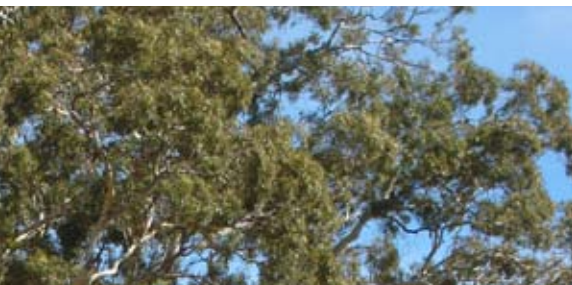
As residential development intensifies, the fauna habitat value of suburban gardens decreases and fauna increasingly relies on habitat on public land. While there is scope to realise the existing habitat potential of urban parks in Burnside, much can still be done in the Hills Face to develop a truly exemplary local nature reserve system. The approximately 650 ha of Hills Face areas of Burnside comprise the following:

- about 100 ha – houses and associated gardens
- about 250 ha – degraded native woodland on private and state government land
- about 50 ha – degraded native woodland on Council reserve land

- about 50 ha – council reserve land which is cleared with some native remnants
 - about 200 ha – private and government cleared land with some native remnants.
- In Skye, the majority of the rare Mallee Box and Sheoak woodland communities are on private property where it is threatened by development or weed (mostly olive) invasion.

While most of the native vegetation in Burnside is very degraded and fragmented, it can be restored through careful weed removal, the fostering of natural regeneration and selective planting, and strategic land acquisition to secure high conservation areas, linkages and buffers. Some planting is required at sites where past land use has effectively eliminated native woody species. The restoration of the Hills Face is a combination of weed removal, natural regeneration and planting.

Since 1999, the Council's Conservation and Land Management Team has propagated many species of indigenous flora from the scattered remnants that existed at the time, and reintroduced these to the many 'biodiversity sites' around Burnside. Most of these sites were selected in 1998–99 according to the recommendations of the 1997 *Biodiversity Action Plan* and subject to resource availability and community acceptance. Other biodiversity sites have been developed following engineering projects along creeks and this kind of site offers the main scope for future extension of native vegetation work in the suburban areas of the city. Many species that were almost locally extinct are now naturally regenerating at these sites.



PRESENT SITUATION

Native shrubs, grasses and ground flora in the metropolitan area have no legal protection and are easily destroyed during building, gardening and even in poorly executed rehabilitation projects. As most people do not recognise native flora nor understand its value, it is not surprising that until recently, native vegetation in Burnside survived only by chance rather than good planning. Very little of the original native flora still exists in the suburban parts of Burnside.

What was once a complex tapestry of vegetation covering the approximately 2100 ha of suburban Burnside, has now been reduced to about 5.3 ha comprising:

The areas of native vegetation developed and managed by the City of Burnside provide security for many of the locally threatened indigenous plant species and habitat for certain native fauna. They provide other community services of education, amenity, reduced fire hazard in the Hills Face, erosion control and improved water quality. But nature needs land to exist on. There is still scope to develop a viable reserve system in the Hills Face areas of Burnside with a vegetation system that provides long-term land management benefits and habitat provision.

ISSUES AND RECOMMENDATIONS

The issues affecting native flora and fauna are the same today as they were when the first Biodiversity Action Plan was prepared in 1997.

Private property

There are two large properties in suburban Burnside that contain small patches of native vegetation. Both are adjacent to Council reserve land. The vegetation would not survive redevelopment of these properties.

Action 1

- IDENTIFY AND APPROACH THE OWNERS OF URBAN PROPERTIES THAT CONTAIN NATIVE VEGETATION WITH A VIEW TO ENCOURAGING THE CONSERVATION OF THE AREAS.

Many private properties in Burnside have creeks running through them. These creeks are generally poorly managed; they have severe weed infestation and provide little habitat.

Action 2

- DEVELOP AN ASSISTANCE PACKAGE ABOUT CREEK MANAGEMENT INVOLVING INFORMATION, CONSULTATION AND PLANT SUPPLY.

Action 3

- NEGOTIATE WITH OWNERS OF STRATEGIC SECTIONS OF CREEK LINE FOR THEIR EVENTUAL ACQUISITION AND DEVELOPMENT AS LINEAR RIPARIAN RESERVE IN ORDER TO DEVELOP CORRIDORS FOR HABITAT (AS WELL AS POSSIBLE RECREATIONAL LINKS).

While average gardens provide habitat for aggressive generalist species of birds, most gardens lack the habitat required for more specialised and rare species.

Action 4

- CONTINUE AND FURTHER DEVELOP THE EXISTING VOLUNTEER PROGRAM THAT PROPAGATES PLANTS FOR RESIDENTS AND SUPPORT THIS WITH APPROPRIATE INFORMATION.

Action 5

- PREPARE A BROCHURE ON USING NATIVE FLORA FOR HABITAT CREATION IN HOME GARDENS.

Private gardens sometimes contain cultivated plants that escape and become troublesome weeds that threaten native vegetation.

Action 6

- PROVIDE INFORMATION TO RESIDENTS ABOUT AVOIDING WEEDY GARDEN PLANTS. THIS COULD INCLUDE LIAISING WITH THE SUSTAINABLE GARDENS PROJECT AT THE BOTANIC GARDENS.

In the Hills Face there are several large properties containing areas of native woodland and other native flora. These areas are threatened by weed invasion and development. Possible ways of ensuring the conservation of these important patches include:

- providing management advice, encouragement and material support
- negotiating to purchase parts of properties where these would make strategic additions to the hills face reserve system
- purchasing whole properties and reselling after appropriate boundary realignment and covenanting has been done.

Action 7

- DEVELOP AND IMPLEMENT GUIDELINES FOR CONSERVING THE REMAINING LARGE PATCHES OF NATIVE WOODLAND IN THE HILLS FACE.

Council property

Weed invasion in Hills Face reserves constitutes the biggest threat to native flora and constitutes the biggest contributor to fire hazard.

Action 8

- PREPARE A REVISED HILLS FACE MANAGEMENT PLAN, REAFFIRMING THE PHILOSOPHY PRESENTED IN THE 1994 HILLS FACE MANAGEMENT PLAN OF NATIVE VEGETATION DEVELOPMENT AND MANAGEMENT IN HILLS FACE RESERVES AS A MEANS OF FIRE HAZARD MANAGEMENT AS WELL AS FOR CONSERVATION.



Action 9

- ENCOURAGE WEED MANAGEMENT ON PROPERTIES ADJOINING HILLS FACE RESERVES BY PROVIDING INFORMATION AND TECHNICAL ASSISTANCE TO RESIDENTS.

When development is occurring on property adjacent to native vegetation, damage is frequently done to native vegetation on Council property through dumping, soil disturbance and run-off. Planning conditions may include the construction of a barrier fence, stormwater retention on-site, construction of silt traps or the piping of stormwater to a watercourse.

Action 10

- DEVELOPMENT APPROVALS SHOULD INCLUDE CONDITIONS THAT PROTECT NATIVE FLORA ON ADJOINING LAND FROM DAMAGE FROM DUMPING OF FILL OR THE FLOW OF WATER AND SEDIMENT.

Stormwater is frequently directed from roads and houses onto Hills Face reserves. This causes erosion or it causes the deposition of sediment, nutrients and weeds in reserves. Examples of the damage caused can be seen at Magill Stone Mine Reserve and at Langman Reserve.

Action 11

- CONSTRUCT ADDITIONAL TRASH RACKS, SEDIMENTATION BASINS AND STABILISED WATERCOURSES TO MANAGE WATER AND SEDIMENT ENTERING RESERVES.

Off-road bikers damage vegetation during unauthorised track construction. The main area where this is occurring is at Dashwood Gully.

Action 12

- PREPARE A YOUTH RECREATIONAL FACILITIES STUDY TO INDICATE DEMAND AND POSSIBLE LOCATIONS FOR BMX-TYPE BICYCLE FACILITIES.

Road construction and road maintenance, particularly roadside spraying, can damage native flora. For instance, over recent years roadside spraying has virtually eliminated the naturally occurring stands of the native Black-head Grass (*Enneapogon nigricans*) on the verges of Sunnyside Road and Hayward Drive. This low growing summer-active perennial grass has been replaced with the annual Love Grass which is a recognised troublesome weed.

Action 13

- ANY PROPOSED WORKS THAT AFFECT ROADSIDES AND ROAD RESERVES IN THE HILLS FACE SHOULD BE ASSESSED FOR IMPACT ON NATIVE VEGETATION AND REMEDIAL ACTION TAKEN TO MITIGATE THE EFFECTS.

At present there are nine roadside sites in Burnside that are marked using the Transport South Australia (TSA) blue marker system. Urban sites are marked with blue paint on kerbs as a signal to road maintenance contractors but, as with the TSA system, many contractors, especially if new to Burnside, do not recognise the significance of these markings.

Action 14

- COUNCIL TO WORK WITH OTHER METROPOLITAN COUNCILS TO DEVELOP A UNIFORM SITE MARKING SYSTEM THAT IS SIMPLE TO APPLY AND WILL BE EASILY RECOGNISED BY FIELD WORKERS.

Native vegetation occurs where it has, by chance, remained uncleared or where sites have become available for revegetation. In a highly cleared and modified environment, all native vegetation is valuable. Conservation and land management outcomes could be greatly improved by taking biodiversity into account into all reserve planning – urban as well as Hills Face.

Action 15

- REAFFIRM THE EXISTING POLICY AIMED AT ESTABLISHING NATIVE VEGETATION ALONG ALL CREEKS ON COUNCIL LAND.

Action 16

- NOTE STRATEGIC SECTIONS OF PRIVATELY OWNED CREEK FOR PURCHASE WHEN THE OPPORTUNITY ARISES,

Action 17

- PLAN FOR REHABILITATION WORKS IN URBAN RELICS OF RED GUM / BLUE GUM FOREST IN HAZELWOOD PARK AND KENSINGTON GARDENS RESERVE.

Action 18

- ENCOURAGE PROPERTY OWNERS TO PROTECT AREAS OF MALLEE BOX WOODLAND IN SKYE.

Action 19

- ENCOURAGE PROPERTY OWNERS TO PROTECT AREAS OF NATIVE GRASSLAND IN AULDANA.

Some plants used in urban landscaping have the potential to spread and become weeds. The management of this problem is very difficult if the species has the general appearance of an indigenous species, or

is related to indigenous species and has the potential to hybridise with them. Of particular concern in this regard are grasses, aquatic plants, Eucalyptus, Acacia and Grevillea.

Action 20

- LIAISE WITH THE SUSTAINABLE LANDSCAPES PROJECT TO PREPARE A LIST OF EXOTIC AND AUSTRALIAN PLANTS THAT CAN BE USED IN LANDSCAPING WITHOUT COMPROMISING LOCAL NATIVE FLORA.

Some plants and landscape materials (e.g. moss rocks, rainforest timbers) are made available commercially at a high cost to the natural environments from which they are sourced. Council has a policy to discourage this practice.

Action 21

- ANY MATERIALS OR PLANTS PROPOSED IN PRIVATE DEVELOPMENT THAT POTENTIALLY COMPROMISE BIODIVERSITY SHOULD BE DISCOURAGED THROUGH COMMUNITY EDUCATION.

Action 22

- ALL MATERIALS AND PLANTS USED IN LANDSCAPING IN COUNCIL PROJECTS SHOULD BE ASSESSED FOR UPSTREAM CONSEQUENCES FOR BIODIVERSITY AND AVOIDED WHERE THERE ARE CONCERNS.

Residents sometimes undertake planting, dumping or other activities in reserves, verges and roadsides that compromise native vegetation. Field officers should have the authority to issue residents with a standard letter requesting appropriate action to remediate the situation.

Action 23

- PROVIDE INFORMATION TO RESIDENTS NEAR NATIVE VEGETATION TO INCREASE AWARENESS OF ITS SIGNIFICANCE AND MANAGEMENT.

Native vegetation and Kaurna culture

An appreciation of the cultural significance of indigenous landscapes to the Kaurna people, and knowledge of their traditional land management practices, will not only develop a respect in the community for the deep cultural history of Burnside but will improve community appreciation of the value of native vegetation and its place in a sustainable urban landscape.

Action 24

- INDIGENOUS CULTURAL AWARENESS TRAINING SESSIONS SHOULD BE HELD FOR STAFF AND FOR THE COMMUNITY.

Action 25

- LIAISE WITH KAURNA PEOPLE TO INCORPORATE KAURNA CULTURAL INFORMATION INTO INTERPRETIVE SIGNAGE, INCLUDING KAURNA NAMES FOR RESERVES.

Species of particular local conservation significance

A number of indigenous plant species are on the verge of local extinction. While several of these species are now in better condition due to Council action, there are many that still await active conservation efforts. Table 2 contains species which are very rare in Burnside and which could, with care, be propagated and established at other sites.

TABLE 2: RARE PLANTS IN BURNSIDE

PLANT SPECIES	LOCATION
<i>Phebalium hillebrandii</i>	One plant known on the Old Bullock Track
<i>Myoporum viscosum</i>	Two wild plants survive at Wyfield Reserve
<i>Pimelea curviflora</i>	Few plants in Gully and Themedra Reserves
<i>Pimelea humilis</i>	Small population at Heatherbank Reserve
<i>Rumex brownii</i>	One remnant plant at Mt Osmond
<i>Rubus parviflorus</i>	Small patches, Chambers Gully, Mt Osmond
<i>Hymenanthera dentata</i>	One plant on Haven Road verge
<i>Plantago varia</i>	Few plants at Heatherbank reserve
<i>Bossiaea prostrata</i>	Two plants at Heatherbank Reserve
<i>Hakea rostrata</i>	One plant on private land at Waterfall Gully
<i>Banksia marginata</i>	Few plants near eastern end of Waterfall Gully Road
<i>Astroloma humifusum</i>	Scattered at Mt Osmond and Stonyfell
<i>Exocarpos cupressiformis</i>	Two plants on private property at Mt Osmond

There are a further 20 or 30 species of small specialised plant whose only occurrence in Burnside is in Heatherbank Reserve and in Ferguson Conservation Park and which rely on the maintenance of high quality habitat for their continued survival.

Action 26

- DETERMINE THREATENED SPECIES MANAGEMENT NEEDS IN BURNSIDE AND ESTABLISH AN ACTION PLAN FOR IMPLEMENTATION.



2. Indigenous trees

Original and naturally reproducing populations of indigenous trees have particular conservation significance and are a primary contributor to a sense of place.

IMPORTANCE FOR BIODIVERSITY

Trees that are relics of the original forests and woodlands are still present in Burnside, particularly in the suburbs towards the hills and along the creek lines. It is the repetition of these elements in the landscape that provides recognisable habitat to wildlife, maintains viable populations of these species and creates the aesthetic of a natural forest or woodland. It also provides the unique sense of place for Burnside, particularly in the suburbs that still support reasonable numbers of remnant indigenous trees.

The larger, long-lived species can still be found, particularly towards the hills, where there was not the same history of broad-acre agriculture (see Table 3). Smaller-growing and short-lived species are now very rare or locally extinct.





Indigenous trees are a natural legacy with particular habitat value, whereas exotic trees in the landscape are a human artefact

TABLE 3: LOCAL INDIGENOUS TREE SPECIES AND THEIR LOCATIONS

BOTANICAL NAME	COMMON NAME	LOCATION OF NATURAL POPULATIONS
<i>Acacia melanoxylon</i>	Blackwood	A few remnant trees at Mt Osmond
<i>Acacia retinodes</i>	Wirrilda	Slopes in Chambers Gully
<i>Acacia provincialis</i>	Swamp Wattle	Waterfall Gully
<i>Acacia pycnantha</i>	Golden Wattle	Scattered through the hills areas
<i>Acacia salicina</i>	Broughton Willow	Glenside, possibly remnant but not confirmed
<i>Allocasuarina verticillata</i>	Drooping Sheoak	Small numbers at Skye & Mt. Osmond
<i>Banksia marginata</i>	Silver Banksia	Waterfall Gully, Cleland
<i>Callitris gracilis</i>	Native Pine	Patch at Ferguson Conservation Park
<i>Callitris rhomboidea</i>	Oyster Bay Pine	A few plants in Chambers Gully
<i>Eucalyptus camaldulensis</i>	River Red Gum	Near creeks and south facing hillsides
<i>Eucalyptus fasciculosa</i>	Pink Gum	A few trees on private property, Skye and Gandy's Gully
<i>Eucalyptus leucoxylon</i>	SA Blue Gum	Over the whole district
<i>Eucalyptus microcarpa</i>	Grey Box	Mt Osmond, Beaumont, Burnside
<i>Eucalyptus porosa</i>	Mallee Box	Remnant woodlands at Skye
<i>Eucalyptus viminalis</i>	Manna Gum	Small patch at Mt Osmond
<i>Eucalyptus leucox.x.microcarpa</i>	Natural hybrid	A few trees at Mt Osmond, Hazelwood Park
<i>Exocarpos cupressiformis</i>	Native Cherry	Very rare, Mt Osmond
<i>Pittosporum phylliraoides</i>	Native Apricot	Very rare, Langman Reserve



TABLE 4: EXAMPLES OF WILDLIFE ASSOCIATIONS WITH LOCAL TREES

<i>Acacia pycnantha</i>	Yellow-tail Black Cockatoo eats galls and boring grubs. Borer holes provide shelters for native bees and wasps; bats live under bark of dead trees; exudates and leaf litter suppress weeds
<i>Acacia melanoxylon</i>	Birds eat aril (connective tissue) of seed
<i>Eucalyptus species</i>	Hollows provide nest sites for possums, bats, parrots and pardalotes; bark provides shelter for bats, spiders and insects; tree creepers feed on insects under bark; pardalotes feed on sap-sucking insects on leaves; honey-eaters feed on flowers.
<i>Allocasuarina verticillata</i>	Main food source for Glossy Black Cockatoo (locally extinct); favoured tree for ringtail possum drey (nest) sites; leaf litter suppresses weeds.

Original and naturally reproducing populations of indigenous trees have particular conservation significance because they represent the evolution of the species at this particular location and because they provide particular habitat for local wildlife (see Table 4). They are also a primary contributor to a sense of place.

RELEVANT PROVISIONS OF TREE MANAGEMENT STRATEGY

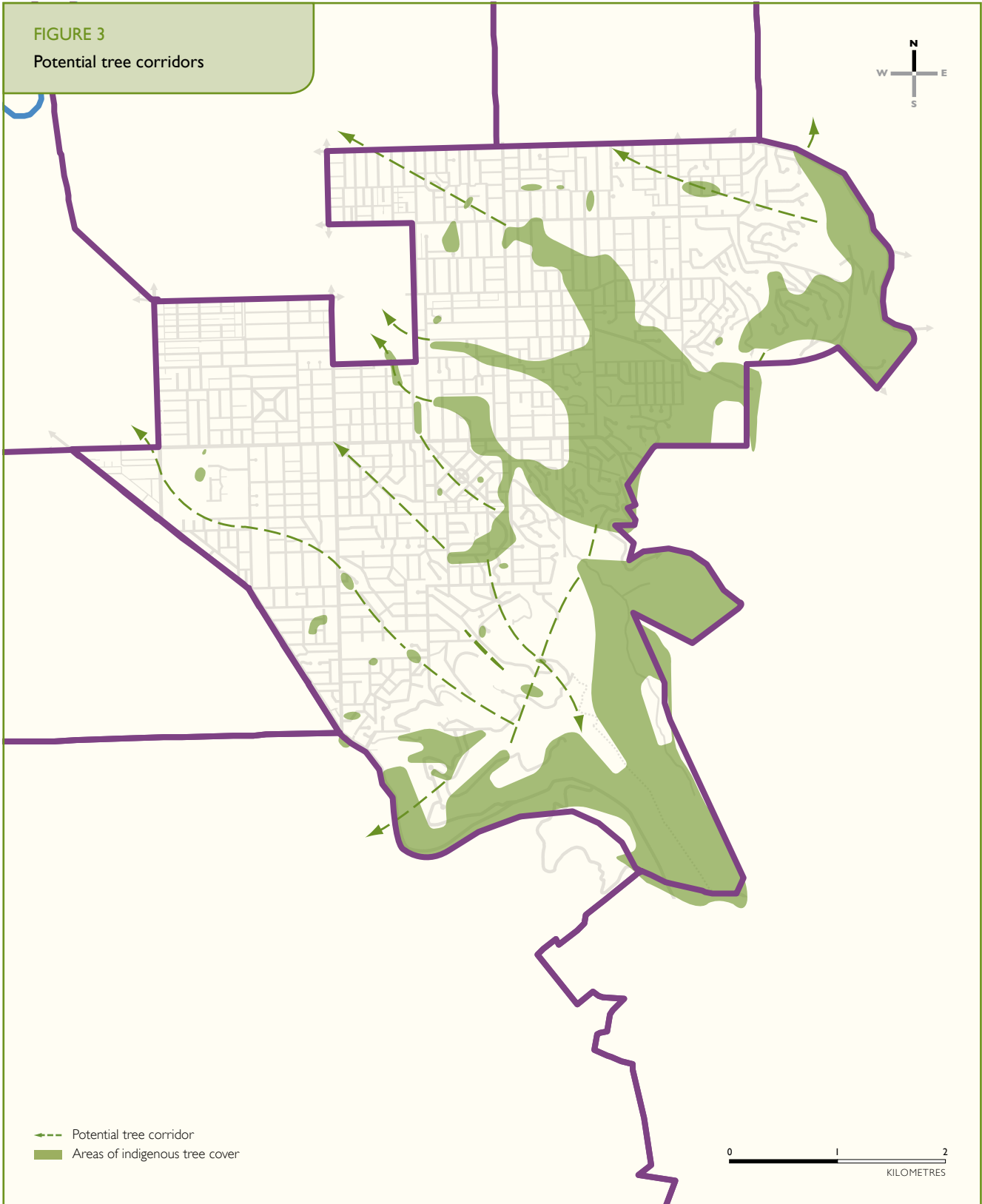
The City of Burnside Tree Management Strategy (2006) contains many provisions relevant to biodiversity management in Burnside. These provisions provide a good basis for biodiversity management as far as it relates to trees on council land.

The Tree Management Strategy provides for the following in relation to biodiversity:

- improved care of remnant indigenous trees
- planting of local indigenous trees in preference to general Australian species
- planting indigenous trees along creek lines
- establishment of indigenous trees along walking trail corridors in Hills Face
- local indigenous trees maintained as important theme in major parks
- planting of local indigenous trees as an appropriate verge treatment in the Hills Face.

FIGURE 3

Potential tree corridors



ISSUES AND RECOMMENDATIONS

The policy and procedures of the Tree Management Strategy will provide for the protection of remnant indigenous trees on Council land with scope for the development of the next generation of these trees. Some issues which were not fully developed in that document are now discussed.

There is still a lack of awareness of the particular significance and benefit of indigenous trees. In assessing applications to remove a significant tree, it should be recognised that indigenous trees are a natural legacy with particular habitat value whereas exotic trees in the landscape are a human artefact. For this reason original indigenous trees should be valued much more highly than planted exotic trees.

Action 27

- PROVIDE INFORMATION ON THE INDIGENOUS TREES OF BURNSIDE— RECOGNITION AND IMPORTANCE.

The tendency for larger houses to be built on smaller blocks makes the survival of indigenous trees problematic in suburban areas.

Action 28

- ENCOURAGE DEVELOPMENT THAT ALLOWS FOR THE CO-EXISTENCE OF LARGE INDIGENOUS TREES.

The genetic make-up of local populations of indigenous flora is compromised by the spread of seed or pollen from planted horticultural forms. Particular care is needed with non-local forms of species that occur naturally in Burnside. *Acacia*, *Eucalyptus* and *Grevillea*, for example, are known to hybridise freely with local species of the same genus.

Action 29

- WHERE IT IS APPROPRIATE, SMALLER GROWING LOCAL EUCALYPTUS SPECIES SHOULD BE TRIED AS STREET TREES, NAMELY *EUCALYPTUS COSMOPHYLLA*, *EUCALYPTUS FASCICULOSA* AND *EUCALYPTUS POROSA*.

Action 30

- WHERE A SPECIES IS INDIGENOUS TO BURNSIDE, FORMS AND CULTIVARS OF THAT SPECIES SHOULD BE AVOIDED AS WELL AS ANY RELATED SPECIES THAT ARE LIKELY TO HYBRIDISE WITH THE LOCAL POPULATION.

It is recognised that most streets are not suited to the establishment of local indigenous species as street trees. In many areas there are scattered indigenous trees on verges which are relics of the former pre-urbanised landscape. These original large trees are habitat islands and their presence should not be considered as out of keeping with the dominant exotic tree species planted elsewhere on the street. There is scope for an alternative verge treatment that respects the presence of these trees. Treatment of the verge by 'Big Red', the venerable *Eucalyptus camaldulensis* tree on Glynburn Road, is an example of this. Any verge planting must comply with Council's Verge Landscaping Policy permitting vegetation to reach a maximum height of 900 mm.

Action 31

- WHERE ADJOINING PROPERTY HOLDERS AGREE, ISOLATED REMNANT TREES SHOULD HAVE A DIFFERENT TREATMENT OF THE VERGE IN WHICH THEY OCCUR. ON THESE VERGES, KIKUYU SHOULD BE REPLACED WITH NATIVE GROUND FLORA WITH SOME WATTLES AND NATIVE APRICOT AS APPROPRIATE TO THE SITE.

Indigenous trees are threatened by competition from exotic weedy tree species. Work is needed to protect indigenous trees from woody weed competition.

Action 32

- WITH APPROPRIATE PUBLIC NOTIFICATION, THE REMOVAL OF DEFINED WEEDY EXOTIC TREE SPECIES FROM PUBLIC OPEN SPACE SHOULD BE APPROVED WHEREVER THEY DIRECTLY COMPETE WITH INDIGENOUS TREES OR THREATEN OTHER NATIVE FLORA. THIS SHOULD APPLY EVEN IF THE TREE IS LARGER THAN 2 METRES IN CIRCUMFERENCE AND WOULD APPLY TO OLIVE (*OLEA EUROPEA*), HAWTHORN (*CRATAEGUS SP.*), ASH (*FRAXINUS ANGUSTIFOLIA*), PINE (*PINUS HALEPENSIS* AND *P. RADIATA*), AND WILLOW (*SALIX SP.*).

Action 33

- HILLS FACE AREAS SHOULD BE REGULARLY PATROLLED AND STAFF AUTHORISED TO REMOVE ALL SELF-SOWN SEEDLINGS OF WEED TREE SPECIES AS THEY ARE FOUND.

Action 34

- AS PART OF THE OPEN SPACE STRATEGY, IDENTIFY ALLOTMENTS THAT CANNOT BE BUILT ON WITHOUT REMOVING IMPORTANT INDIGENOUS TREES AND CONSIDER PURCHASING FOR THE PROVISION OF OPEN SPACE, IF REQUIRED.

Action 35

- THERE IS SCOPE TO IMPROVE THE PROTECTION OF INDIGENOUS TREES ON PRIVATE PROPERTY.

Action 36

- OFFER TO PAY THE COSTS ASSOCIATED WITH PREPARING LAND MANAGEMENT AGREEMENTS FOR RESIDENTS WANTING TO VOLUNTARILY PROTECT INDIGENOUS TREES ON THEIR PROPERTY. PREPARE A BROCHURE EXPLAINING THIS.

Mistletoe is a group of native partially parasitic plants that grow on indigenous (as well as some exotic) trees. Mistletoe provides important habitat for possums, birds and butterflies. In well-balanced natural woodlands, mistletoe populations are controlled by possums, by fire and by the natural tendency of healthy trees to shed mistletoe clumps. Trees under stress from other causes can develop large populations of mistletoe and may die. The contributing stress factors affecting trees should also be addressed. In Hills Face areas, woody weed competition is a major stressor of indigenous trees. At present, the following rule is used to guide operators as to the amount of mistletoe to remove from a tree.

MISTLETOE—% OF TREE CROWN	TREATMENT—% OF MISTLETOE REMOVED
> 70%	100%
30 to 70%	50%
< 30%	none

Action 37

- THE PERCENTAGE OF MISTLETOE REMOVED FROM A TREE SHOULD BE DETERMINED BY THE EFFECT THE MISTLETOE IS HAVING ON THE TREE.

Action 38

- WOODY WEEDS SHOULD BE REMOVED AROUND INDIGENOUS TREES.

Action 39

- A FACT SHEET SHOULD BE PREPARED ABOUT MISTLETOE, ITS ROLE IN NATURE AND ITS MANAGEMENT.

Where native vegetation corridors are not possible in urbanised areas, indigenous trees on private property can form valuable canopy corridors for birds, possums and koalas. Urban intensification is compromising existing corridors and foreclosing opportunities for developing these corridors in the future.

Action 40

- PROVIDE INCENTIVES FOR THE ESTABLISHMENT OF TREES IN APPROPRIATE LOCATIONS IN CREEK ZONES FOR THE CONSERVATION OF INDIGENOUS TREE CANOPY CORRIDORS.

Hollows that form in trees as they age are vital habitat for birds, bats and possums. Different species require different hollow sizes. Hollows take from decades to centuries to form depending on the size. Protection of hollows should be an important factor in tree maintenance.

The following guidelines should be followed in relation to hollows:

- No hollows are to be removed unless there is a definite risk to public safety and the risk cannot be overcome by some other means.
- Every hollow removed will be replaced by an appropriately sized nest box at a nearby secure location.
- Hollows will be checked for the presence of wildlife prior to removal. If wildlife are present removal will be delayed or the wildlife rescued and relocated to a nest box nearby.
- Where hollows are unavoidably removed, they are to be kept and, after consultation with Team Leader, Biodiversity, placed where they can contribute to habitat.
- Where appropriate, feral bees that occupy a hollow will be eradicated.

Action 41

- DEVELOP AND ADOPT POLICIES AND GUIDELINES FOR THE CONSERVATION OF TREE HOLLOWES.

Birds and Ringtail possums make nests in trees for shelter and for breeding. These nests, together with the wildlife they contain, can be destroyed during tree maintenance and removal.

Action 42

- DEVELOP AND ADOPT POLICIES AND GUIDELINES FOR THE CONSERVATION OF NESTS IN TREES DURING ARBORICULTURAL WORKS.





3. Wildlife

The South Australian Museum estimates that, prior to European settlement, a total of 219 vertebrate fauna species occurred in the area that is now the City of Burnside. Forty-one of these are known to now be extinct.

PRESENT SITUATION

Appendix 2 lists the fauna species likely to still occur in Burnside together with their conservation status. No attempt has been made to document invertebrate species except for butterflies of which 15 are believed to still occur in Burnside. This is not to indicate that invertebrate species are not vitally important for functioning ecosystems and human wellbeing – rather it reflects the enormity of the task of documenting them and the paucity of existing knowledge.

Birds

A total of 150 bird species (142 native, 8 exotic) are recorded in the Burnside. Of these, 15 native bird species are now extinct. Of the remaining 135 bird species, 71 are resident birds that inhabit the council area all year round. The remaining 64 species are either occasional visitors to the region (3 species), species that are spring-summer visitors to the region (22 species), species that are autumn-winter visitors to the region



... the bird species occurring in Burnside will benefit from the management of remaining old-growth eucalypts ...



Red-rumped Parrot is an uncommon species that would benefit from habitat restoration or revegetation.

Native grasses and seed-producing plants also benefit parrots, especially ground foraging parrots such as the Red Rumped Parrot and Lorikeets. Native grasses also encourage pigeons and finches.

Honeyeaters feed on the nectar of flowers as well as fruit, insects and spiders. Most feeding takes place in lower areas of bushes and thickets. Most of the honeyeater species within the Burnside area are found in heath, forests and woodland areas of the foothills and in gardens in adjoining residential areas. White-plumed Honeyeater and New-holland Honeyeater occur in gardens throughout, whereas other species require more specialised habitat.

Insectivorous species will forage in all parts of the vegetation for a variety of invertebrates. At present, common insectivorous species in the Hills Face areas include wrens, pardalotes, Welcome Swallow, and Willie Wagtail. Generally, species that may also benefit from increased habitat include flycatchers, fan-tails, whistlers, babbler, cuckoo-shrikes, Scarlet Robin, weebills and scrubwrens.

The exotic *Pinus halepensis* (Aleppo Pine) is a food source for the vulnerable *Calyptorhynchus funereus* (Yellow-tailed Black Cockatoo). The effect of the removal of Aleppo Pines on the survival of the Yellow-tailed Black Cockatoo is an issue of concern for the Burnside Council. However, the impact of Aleppo Pines on the wider environment and their contribution to biodiversity loss may be greater than their benefit as a food source to the

cockatoos. Aleppo Pines are known to dominate riparian zones, use water faster than other species and so create extremely salty conditions within the soil, making it difficult for grasses and other salt-sensitive species to grow (DEH 2003). The dense and spreading nature of their canopy also prevents sunlight and vital nutrients reaching understorey species; consequently, their overall impact on the surrounding environment may be detrimental, despite their being a food source.

Known habitat of the Yellow-tailed Black Cockatoo includes eucalypt forests and woodlands that support hollows for nesting and breeding (Morcombe 2003). Therefore the importance of large old-growth trees within the area, such as River Red Gums, is probably more valuable to the survival of the cockatoos than that of exotic vegetation species. Additionally, the cockatoos feed largely on seeds of native trees and shrubs including eucalypts, hakeas, banksias, casuarinas, hakeas, and grass trees (Morcombe 2003). The removal of scattered Aleppo Pines from Burnside is likely to increase biodiversity over time, if the clearance of these trees is coupled with revegetation of indigenous food plants.

Mammals

In total, it is likely that approximately 47 mammals may have historically resided within the City of Burnside; of these, 19 animals are extinct and 8 are exotic species.

Western Grey Kangaroos occur in small numbers in the Mount Osmond area and are secure provided that development does not intensify and dogs are kept under control.



(11 species), or irregular visitors (28 species) (G. Carpenter pers. comm. 2007, and see Appendix 2a).

In general, the bird species occurring in Burnside will benefit from the management of remaining old-growth eucalypts within parks and reserves, as well as from revegetation of understorey species that provide a range of food and shelter resources.

Parrots eat fruits, blossoms, grains, flower and grass seeds, and the nectar of native flowers (Morcombe 2003). Common parrots in Burnside are Adelaide Rosella, Musk Lorikeet, and Rainbow Lorikeet. Red-

Koalas are now common in the Eastern parts of Burnside and have been reported in Glenside. They are threatened by traffic and dogs.

Small and medium-sized ground-dwelling mammals have recorded the greatest decline in abundance over other animal classes; mammals in these class sizes are directly affected by the removal of native vegetation. Dense ground vegetative layers conceal such animals from predators and provide important nesting and food resources.

Short-beaked Echidna, Yellow-footed Antechinus, Bush Rat, Swamp Rat, and possibly Water Rat, are probably the only ground-dwelling native mammals that may still be found within Burnside; however, these species will only be found in areas of the Hills Face Zone where some cover of understorey vegetation persists. These species will not move into surrounding urban areas as extensive native bush supporting a diversity of species is critical to their survival. Their continued existence within the Hills Face Zone depends on the continued existence of native understorey vegetation.

Southern Brown Bandicoot is nationally endangered and listed as vulnerable under state legislation. This species occurs within Cleland Conservation Park, which is adjacent to Burnside, and has also been reported by Burnside residents near Waterfall Gully. This species requires both dense and open habitat for shelter and areas to forage. Increasing understorey vegetative cover of mixed age stands and heathland vegetation may permit this species to

extend its current range into the Burnside Council area along the Hills Face Zone.

The most commonly encountered mammal species that inhabit urban environments and will continue to persist within Burnside are the Common Ringtail Possum and Brushtail Possum. These species can live on a range of exotic garden vegetation and often use domestic structures for shelter.

Bat species that can persist within the Council area, given the right conditions, include: Gould's Wattled Bat, Chocolate Wattled Bat, Southern Freetail-bat, Lesser Long-eared Bat, Large Forest Bat, and Southern Forest Bat. Bat species mostly have roosting sites within the Mount Lofty Ranges and travel into the Council area to forage although the large remnant Red and Blue Gums associated with the major creeks also provide suitable roosting sites and foraging habitat. The abundance of bats within the area may increase through revegetating reserves, particularly along creeks, so as to increase invertebrate species diversity and abundance, permitting a consistent supply of food. Continued existence of bat populations can be facilitated through retaining old-growth trees containing hollows, and by attaching roosting boxes to fixtures that allow the boxes to be supported high off the ground, out of reach of potential predators.

Reptiles

Forty-two reptile species have been noted as possibly occurring in Burnside. Of these, Pygmy Bluetongue is the only species which is extinct within the Mount Lofty Ranges. There are several reptile species that will persist in highly modified urban environments and so do not rely solely

on the presence of native vegetation. The following species are probably found within the City of Burnside: Marbled Gecko, Three-toed Earless Skink, Four-toed Earless Skink, Garden Skink, Bougainville's Skink, Dwarf Skink, Barking Gecko, Sleepy Lizard, Eastern Bluetongue, and Eastern Brown Snake. While these species are robust and can inhabit most environments, increasing understorey vegetation and substrates (i.e. rocks, bark, and leaf litter) will increase their numbers.

There is a suite of reptile species that could potentially persist within Burnside, but are reliant on specific native habitat, these reptiles are: Lined Worm-lizard, Eastern Striped Skink, Adelaide Snake-lizard, Eastern Spiny-tailed Gecko, White's Skink, Southern Four-toed Slider, Adelaide Snake-eye, Mallee Snake-eye, and Eastern Bearded Dragon. These species will not be found within residential properties containing garden plants, but in reserves, parks, and roadside corridors supporting native vegetation habitats. Important to these species are tussock-shaped plants and heathland plants that provide areas to shelter and cover while foraging. Plant species used for revegetation purposes should include both native grassland species and heathland species, so as to create mixed height stands.

Cunningham's Skink has a state rating of vulnerable and is currently found within rocky outcrops (Wilson & Swan 2003) within the Mount Lofty Ranges, usually on south-west aspects. This species has a patchy distribution and may benefit from revegetation and weed control within areas of the Hills Face Zone. Council could potentially play an active role in the recovery of this species by increasing biodiversity

within its region through an increase in understorey vegetation and rocky substrates. Cunningham's Skink is mainly vegetarian and feeds on fruits, flowers, green shoots, and sometimes invertebrates (Cogger 1994). Creating understorey vegetation of flowering and fruiting plants will present a reliable food source for this species. Additionally, ground layers of native grasses will provide valuable food resources. The South Australian Herpetology Society will be contacted for advice on the management of this species. Other possible species that may also benefit from management of Cunninghams Skink and have the potential to increase in abundance within the Burnside area are Little Whip Snake, and Red-bellied Black Snake.

Amphibians

Seven amphibian species have been recorded within the City. Healthy freshwater systems supporting a mixture of sedges, reeds, and rushes, will create a diversified ecosystem allowing frogs to reside within creeklines. Important to frogs is a consistent food source of invertebrates. Increasing creek line biodiversity through an increase in a variety of wetland plant species and an increase in native grasses and shrubs located away from the banks of the creek will increase invertebrate species diversity and abundance, and provide a food source for local frogs. The species most likely to be found within Burnside freshwater systems are Common Froglet, Eastern Banjo Frog, Spotted Grass Frog, Brown Tree Frog, and Brown Toadlet.

An increase in wetland plants and creek line habitat may influence other less common frog species to utilise Council areas, such as Painted Frog, and Golden Bell Frog. These

species rely on healthy freshwater systems with a diversity of invertebrates for a food source (Cogger 1996).

Butterflies

There are several butterfly species that inhabit urban areas and could be expected within the City of Burnside. The most common of these are Common Brown, Meadow Argus, Small Grass Yellow, Australian Admiral, Lesser Wanderer, Common Grass-blue, Marbled Xenica, Australian Painted Lady, Wanderer, and Two-spotted Line-blue (Collier et al. 2006; Grund 2004; Turner 2001).

Habitat degradation has threatened butterfly populations, as many butterflies have specific habitat requirements and rely on a particular species of plant for their survival (Turner 2001). Urban habitats are becoming particularly important for maintaining butterfly diversity and may become habitat refuges, providing suitable host plant and nectar plant sources (Collier et al. 2006). While the butterflies listed above are quite common and often found in urban environments, their continued survival depends on available habitat. Important in the management of butterfly populations can be stands of native grasses on which many butterflies feed or use as host plants. Native grasses and related species that could be selected for revegetation within the City to attract butterflies are: *Lomandra* species, *Dianella* species, *Austrostipa* species, *Themeda triandra*, and *Austrodanthonia* species.

Planting a suite of flowering shrubs, such as *Acacia* species, *Pultenaea daphnoides*, *Hakea carinata*, and *Bursaria spinosa* will create a mosaic of flowering plants as nectar plant

sources. Larger plants, such as *Eucalyptus* species and *Leptospermum* species would also be important nectar sources for butterfly species.

It is unlikely any wetland species of butterfly exists within the Council area although a few species are found within the Adelaide region. Most of the wetland species are of the genus *Hesperilla* (Turner 2001). Sedges like *Gahnia* species are integral to the survival of wetland butterflies. Increasing the abundance of sedges within creek lines may assist these butterfly species to secure their existence within the greater Adelaide region. Waterfall Gully Reserve could be revegetated as an important habitat area for wetland butterflies.

The Butterfly Gardening website at <www.butterflygardening.net.au> provides photo identification of known South Australian species and their conservation status.

AVAILABLE HABITATS WITHIN THE CITY OF BURNSIDE

Pre-European vegetation communities are now completely cleared or much degraded within the City of Burnside; however, several remnant pockets of native vegetation, while modified, are still scattered throughout the district.

Retaining remnant native trees, especially old growth *Eucalyptus* species, within the City is vital for hollow-dependent fauna. Exotic trees (i.e. Aleppo Pine, Plane Trees, Jacarandas, and other introduced tree species) do not provide the same habitat functions as Eucalypts due to the absence of tree hollows, shedding bark, flowers and leaf eating insects. A recent study

investigating the importance of street trees (Red Gums, Jacarandas, Plane Trees, and Crimson Bottlebrush) for different bird groups within the Adelaide region revealed that bird abundance within indigenous River Red Gums was significantly higher than for Plane Trees and Jacarandas, especially during autumn, winter, and early and late summer. During spring the Crimson Bottlebrushes were utilised by more bird species than any other tree (Young, Daniels and Johnston 2007). This study indicates the importance of native trees as both a nesting and food source for birds and demonstrates the necessity of safeguarding native trees in Burnside.

To increase the habitat value of the remaining woodlands within the City of Burnside, Council will need to revegetate within parks, reserves, and roadside corridors to increase plant diversity through the creation of a native plant understorey. Reserves such as Beaumont Common, Kensington Park Reserve, and Danthonia Reserve are examples of remnant woodlands that are being revegetated and have consequently become important areas for wildlife. To increase the diversity of wildlife found in Burnside it is important that plant species used for revegetation purposes are selected to create different strata layers; different plant heights will create a mosaic of habitat types that will provide important shelter for different classes of fauna.

MANAGING WILDLIFE PROBLEMS

Possoms

The possum species most commonly encountered in urban environments are the Common Ringtail Possum and Common Brushtail Possum. With the removal of

many large Eucalypt trees, possums have been forced to find shelter and nesting sites in alternative settings and are now often viewed as pests in urban environments. The Common Brushtail possum is most likely to inhabit buildings and permanent fixtures, usually roof space, while the Common Ringtail Possum usually seeks shelter amongst dense foliage of trees or shrubs and will make use of ornamental native plants. Both species will feed on introduced fruits and flowers.

While populations of the Common Ringtail Possum and Common Brushtail Possum remain secure within the Greater Adelaide Region, Mount Lofty Ranges and Kangaroo Island, the Department for Environment and Heritage has identified that the Common Brushtail Possum has suffered a decline in abundance and reduction in its range across South Australia since European Settlement due to removal of its natural habitat (i.e. large *Eucalyptus* species). Further decline in both the possum's area of occupancy and extent of occurrence is continuing (BioCity 2007). The Department for Environment and Heritage reviewed the status of these species and recommended that the Common Brushtail Possum be listed as rare on the *National Parks and Wildlife Act 1972* Threatened Species Schedules in 2004. At present the conservation status of both possums remains unchanged. It is important, however, to note the concerns over the possible decline in Common Brushtail Possum abundance so as to recommend appropriate management of possums within Burnside.

Within South Australia, possums are protected by law under the National Parks and Wildlife Act and learning to

live with them in residential settings is the preferred management option to secure their existence within a modified landscape. Removal of captured possums to new native locations is not an option as it usually results in mortalities. Possums are territorial and existing animals will fight with other possums released into their territory.

At present the City of Burnside has a *Possum Management Policy* that details correct management of possums within residential settings. Council staff administering possum management information should understand the Possum Management Policy so as to deliver appropriate information to residents.

Action 43

- TRAINING SHOULD BE PROVIDED TO ENSURE THAT STAFF UNDERSTAND THE POSSUM MANAGEMENT POLICY AND CAN DEAL EFFECTIVELY WITH INDIVIDUAL RESIDENT PROBLEMS.

Action 44

- RESIDENTS SHOULD BE DIRECTED TO COUNCIL'S WEBSITE AND THE AVAILABLE INFORMATION ON POSSUM MANAGEMENT.

Action 45

- AN ARTICLE DETAILING CORRECT POSSUM MANAGEMENT SHOULD BE SUBMITTED WITHIN A LOCAL NEWSLETTER OR THE LOCAL MESSENGER ANNUALLY.

Action 46

- A BROCHURE SHOULD BE PREPARED OUTLINING BURNSIDE'S POSSUM MANAGEMENT POLICY.

Snakes

Snakes are an essential part of the food chain, both as food for other animals and as predators of small animals, for example, mice, rats and frogs. Consequently, the presence of snakes in Burnside Council is a natural occurrence that should be recognised. Snakes have received bad publicity and their behavior is often misinterpreted as aggressive. Most venomous snakes are shy animals and would prefer to retreat from threat of danger. Most snakes will only try to bite if they are cornered or unduly annoyed. Many bites occur when people attempt to kill a snake, when, in most cases, it is not harming anyone, or is trying to retreat to shelter.

Snakes move in search of food, mates and somewhere safe and dry to shelter, for instance under a large log, sheet of galvanized iron, tree stump, woodpile, or concrete slab. If the area immediately around a house is free of rubbish and thick vegetation, snakes should not pose a threat within urban settings. To increase the public's awareness and improve the snake's image, more positive information must be available in an educational format to encourage people to want to conserve them.

Action 47

- PROVIDE EDUCATIONAL PAMPHLETS EXPLAINING THE NATURAL SHY BEHAVIOUR OF SNAKES, AND THEIR PREFERENCE TO RETREAT FROM HUMANS IN SEARCH OF SHELTER IF APPROACHED.

Action 48

- INTERPRETIVE SIGNAGE IN RESERVES SHOULD EXPLAIN SNAKE BEHAVIOUR AND COUNTER THE NEGATIVE IMAGE ATTACHED TO AUSTRALIAN SNAKES.

Termites

Termites are a natural part of ecosystems and play a vital role in reducing fire hazard and sequestering carbon in Australian landscapes. They eat dead wood and aerate and stabilise the soil. They also provide a food source for Echidnas and reptiles.

There are about seven species of termite naturally occurring in Burnside. Of these, three frequently cause damage to timber in houses and other structures. An understanding of termite behaviour will help with the protection of assets from termite attack.

In undisturbed environments, termites form mounds from which their workers forage for a distance of up to thirty metres. Termite mounds further than thirty metres from an asset are not a threat and should remain undisturbed.

Action 49

- INFORMATION BE PROVIDED TO THE PUBLIC ABOUT TERMITES—MANAGING THREATS AND UNDERSTANDING THEIR ROLE IN NATURE.

FERAL AND DOMESTIC ANIMALS

Feral and domestic cats

Cats pose one of the greatest threats to native wildlife within the City of Burnside as they are predators of birds, reptiles, and small mammals. A study of 421 cat owners in Adelaide and rural parts of South Australia and Victoria found that approximately 62% of domestic cats took birds, 59% took mammals and 34% took reptiles; some took frogs and insects (Paton 1991). Capture rates varied with locality, with less captures occurring within suburban

areas (22.1 individual prey taken per year) and more captures within rural areas (54.3 prey/year), presumably reflecting differences in prey abundance or accessibility, or in the opportunities for hunting by the cats.

There is compelling evidence that domestic and stray cats have impacts on native wildlife, mainly through direct predatory impacts. However, indirect impact via transmission of the disease toxoplasmosis from cats to native wildlife is also of concern. Toxoplasmosis is carried by cats and can be transferred to native wildlife and result in symptoms of poor coordination, blindness, lethargy, respiratory and enteric distress, and often sudden death (Canfield et al. 1990).

There are steps that can be taken to mitigate the effects of cats on wildlife within the City.

Action 50

- ENCOURAGE CAT OWNERS TO CREATE CAT ENCLOSURES HOUSING CATS, OR KEEP CATS INDOORS, ESPECIALLY AT DAWN AND DUSK AND OVERNIGHT.

Action 51

- ENCOURAGE RESIDENTS TO GET CATS DESEXED AS THEY ARE LESS LIKELY TO WANDER WHEN DESEXED.

Action 52

- CREATE A LINK ON THE COUNCIL'S WEBSITE INFORMING THE PUBLIC OF CORRECT MANAGEMENT OF DOMESTIC CATS AND DOGS.



Action 53

- PROVIDE PAMPHLETS DETAILING CORRECT CAT MANAGEMENT AT THE CIVIC CENTRE FOR RESIDENT COLLECTION.

Foxes

Vulpes vulpes (European Red Fox) is an adaptable and elusive predator common in rural and urban areas throughout southern Australia, and does not favour any particular habitat type. Predation by the fox is a major threat to the survival of native Australian fauna, especially for non-flying mammals weighing between 35 g and 500 g and ground-nesting birds. Reptiles, amphibians and invertebrates are also preyed upon by the fox.

The management of the Red Fox is a complex issue and is difficult to manage within a residential area such as Burnside. Poison baits are used as a management method for foxes within rural settings, but are not permitted for use within urban areas as indirect poisoning of other species, such as domestic pets may result. Council can indirectly manage for foxes by providing additional shelter and refuge sites for native fauna through increased cover of native plants within reserves and parks; thus reducing the number of prey that may be taken by foxes.

Action 54

- DENSE SHRUBBY UNDERSTOREY AREAS SHOULD BE ESTABLISHED AT APPROPRIATE LOCATIONS IN RESERVES TO ENABLE NATIVE FAUNA TO STAY UNDERCOVER AND CONCEAL THEMSELVES FROM POTENTIAL PREDATORS.

Dogs

Dogs pose less threat than cats to native wildlife. The major threat from dogs is incessant barking and chasing of native wildlife. A native animal that is cornered by a dog and is subject to persistent barking will become stressed, which may eventually result in the death of the animal. Dogs can also spread disease through faecal matter and transfer of soil within reserves and parks.

Action 55

- IN AREAS OF NATURAL HABITAT, DOGS SHOULD BE KEPT ON LEADS AND NOT PERMITTED TO WANDER OFF DESIGNATED OPEN AREAS OR TRACKS.

INCREASING HABITAT FOR NATIVE FAUNA

As a result of habitat loss and fragmentation within Adelaide, the changes in distribution and abundance of particular plants and animals are a result of habitat reduction, exotic species invasion, habitat fragmentation, and changes in external processes affecting the dynamics of vegetation fragments (Turner 2001). With only 12 % of native vegetation remaining within metropolitan Adelaide (Turner 2001), it is vital that areas of remnant vegetation are managed appropriately to halt the decline of further habitat loss and safe-guard vital habitat for native faunal species.

Two important issues are involved in habitat fragmentation. The first and obvious issue is the reduction in habitat available for fauna; the second issue is that the remaining habitat is usually not one large patch of vegetation, but rather many very small patches (Saunders et al. 1991). Most patches of vegetation remaining in Burnside are small. It is imperative that the biodiversity within these small parcels of land is maintained and,

where possible, additional connecting habitat corridors are generated so as to buffer the remaining patches of vegetation and act as vegetation corridors, therefore providing a vegetative link for faunal species to traverse to other potential habitats. The remaining pockets of native vegetation within Burnside Council need to be adequately managed and monitored to prevent further decline of native plant species.

Action 56

- PROVIDE INFORMATION TO RESIDENTS ABOUT BACKYARD HABITAT DEVELOPMENT, NEST-BOX PROVISION, DOG AND CAT ENCLOSURES, MINIMISING CHEMICAL USE.

Action 57

- MAXIMISE HABITAT FEATURES IN COUNCIL PLANTED SITES – LOCAL PLANTS, DIVERSITY OF FLOWER TYPES AND TIMES, SHELTER AND GROUND MULCH LAYER.

Action 58

- MANAGE WOODY WEEDS TO MINIMISE DISRUPTION TO WILDLIFE HABITAT.

Action 59

- WORK WITH NEIGHBOURING COUNCILS TO DEVELOP REGIONAL HABITAT LINKAGES.

Through promotion of biodiversity and increasing habitat value for wildlife within the Council area the outcomes of the Council's Strategic Plan, Vision 2020 will be addressed. Not only will this enhance the biodiversity value within Council, but also provide important vegetation corridors to surrounding council districts, and so contribute to biodiversity in a broader context.



4. Urban planted sites

Urban sites planted with native flora provide habitat stepping stones or corridors that allow the dispersal of fauna into suburban areas.

IMPORTANCE FOR BIODIVERSITY

Many of the biodiversity sites in suburban Burnside contain planted native flora. The propagation sources of these plants are local remnant populations and records have been kept of species and sources. Whilst these sites cannot replicate the diversity of species and interactions that occur in a natural vegetation system, they:

- create the general aesthetics of native habitat in an urban setting
- require very low water inputs.

They also provide:

- the life support system for old indigenous trees when established under them
- habitat for many local plant species that have low natural populations
- habitat for various native fauna species
- many of the ecosystem services of remnant native vegetation
- a connection with nature which, for many residents, is their main association with nature.





There is scope for more use of local flora in horticultural situations and this should remain the role of the horticultural staff

As the landscape changed, both directly through land clearance, cropping, mining etc., and indirectly through the effects of introduced plant and animal species and altered fire regimes, people began to consider the landscape they had created as the ideal natural landscape and did not miss the wildflower meadows, the tall open forests and the perennial clear streams that once were features of the area. So today, a landscape approximating the condition of the land prior to European settlement is considered by some to be ugly and threatening. People have become accustomed to being able to irrigate the land as they see fit and so an irrigated, simplified and controlled aesthetic has developed. Whilst occasional droughts provide ample reason for improving the water use efficiency of landscapes, a philosophy of living within the limitations of the continent has not become widely accepted.

In developing planted biodiversity sites in Burnside, the Conservation and Land Management Team has strived to manage sites in a way that leads to a new urban aesthetic without being too challenging. Management methods include:

- occasional irrigation at some sites to keep plants looking fresh
- thorough weed control
- pruning of dead wood
- cutting back herbaceous species after the growing season
- cutting native grass twice or more a year.

Many of these management approaches replicate to some degree the effects of the burning practices employed by Aboriginal people in the past.

Whilst many urban sites are so small that they must be entirely managed for urban aesthetics, it is important to find some sites which are so located that an attempt can be made to restore, as far as is practicable, the composition and structure of pre-European landscapes.

PRESENT SITUATION

Since the inception of the Conservation and Land Management Program (formerly the Biodiversity Program), approximately 50 urban sites have been established. See Figure 5.

Even where some native flora is present on the site, some planting is usually done for the following reasons:

- the need for more diversity
- the need for quick results to keep residents supportive
- the need to satisfy residents requirements for screening and other aesthetic considerations.

At planted urban sites we apply the following principles:

- respect all remnant native flora and natural regeneration
- completely eradicate weeds
- plant only local native flora
- maintain 'urban aesthetics'
- keep records of plantings and source locations.

Parks field staff have also undertaken some local flora plantings in the reserves they maintain. A particularly good example of this is Ifould Reserve, Burnside. There is scope for more use of local flora in horticultural situations and this should remain the role of the horticultural staff rather than Conservation and Land Management staff.

- habitat stepping stones or corridors that allow the dispersal of fauna (particularly birds) into the suburban areas.

The aim for urban planted sites is to eliminate all weed species and then to manage them according to the aesthetics and usage of the site.

AESTHETICS

Warburton (1981) reports the early colonists writing glowing reports of:

...the luxuriance of the Kangaroo Grass, the native flowers and the fine trees that ornamented the Adelaide Plains.

ISSUES AND RECOMMENDATIONS

Many biodiversity sites in Burnside have been established in association with stormwater projects along creeks or stormwater basins. These sites offer a great opportunity for the development of habitat and corridors as an integral part of improving the engineering and water quality outcomes of the projects. It is important to continue to combine local flora establishment with stormwater projects and to plan vegetation aspects from an early stage of project development.

Action 60

- MAXIMISE OPPORTUNITIES FOR BIODIVERSITY IMPROVEMENT THROUGH STORMWATER DETENTION BASINS AND CREEK-ZONE STABILISATION PROJECTS AND PLAN FOR INDIGENOUS VEGETATION ASPECTS FROM AN EARLY STAGE OF PROJECT DEVELOPMENT.

Dry-land sites away from watercourses are more difficult to secure as biodiversity sites because these areas are more in demand for other uses. Dry-land sites are important for biodiversity because they represent a habitat for vegetation communities and species that do not grow near water. Some major reserves have great potential for biodiversity improvement that is yet to be realised. These areas include unvegetated lengths of creek line as well as areas of original forest canopy:

- the creek in Tusmore Park
- the creek in Hazelwood Park
- areas under forest canopy in Hazelwood Park
- the creek in Kensington Gardens Reserve
- areas under forest canopy in Kensington Gardens Reserve.

While it is recognised that developing natural areas in these reserves may not be compatible with traditional recreational use and aesthetics, such areas could add a new dimension that would improve the diversity of people's experience.

Action 61

- DEFINE BIODIVERSITY AREAS AS PART OF PLANNING FOR MAJOR PARKS.

Most of the urban biodiversity sites in Burnside are in the suburbs towards the foothills. Very little native flora exists in western parts of the city. This means that while habitat corridors and stepping-stones enable fauna to enter suburban areas, they do not connect with the River Torrens or the Adelaide park lands. While it must be accepted that high land values preclude the development of extensive corridors in these areas, development control and planting policy can improve the habitat value of these areas. The City of Unley has led the way with biodiversity work in inner suburbs with the Windsor Street Project – part of a plan to develop a habitat link from Brownhill Creek to the South Park Lands. This project has received awards and great support from residents.

Action 62

- IDENTIFY BIODIVERSITY IMPROVEMENT OPPORTUNITIES IN ANY SUBDIVISIONS THAT MAY OCCUR, PARTICULARLY IN THE PROPERTIES THAT STILL EXIST IN GLENUNGA (E.G. GLENSIDE HOSPITAL, MINERAL FOUNDATION, GLENUNGA HIGH SCHOOL).

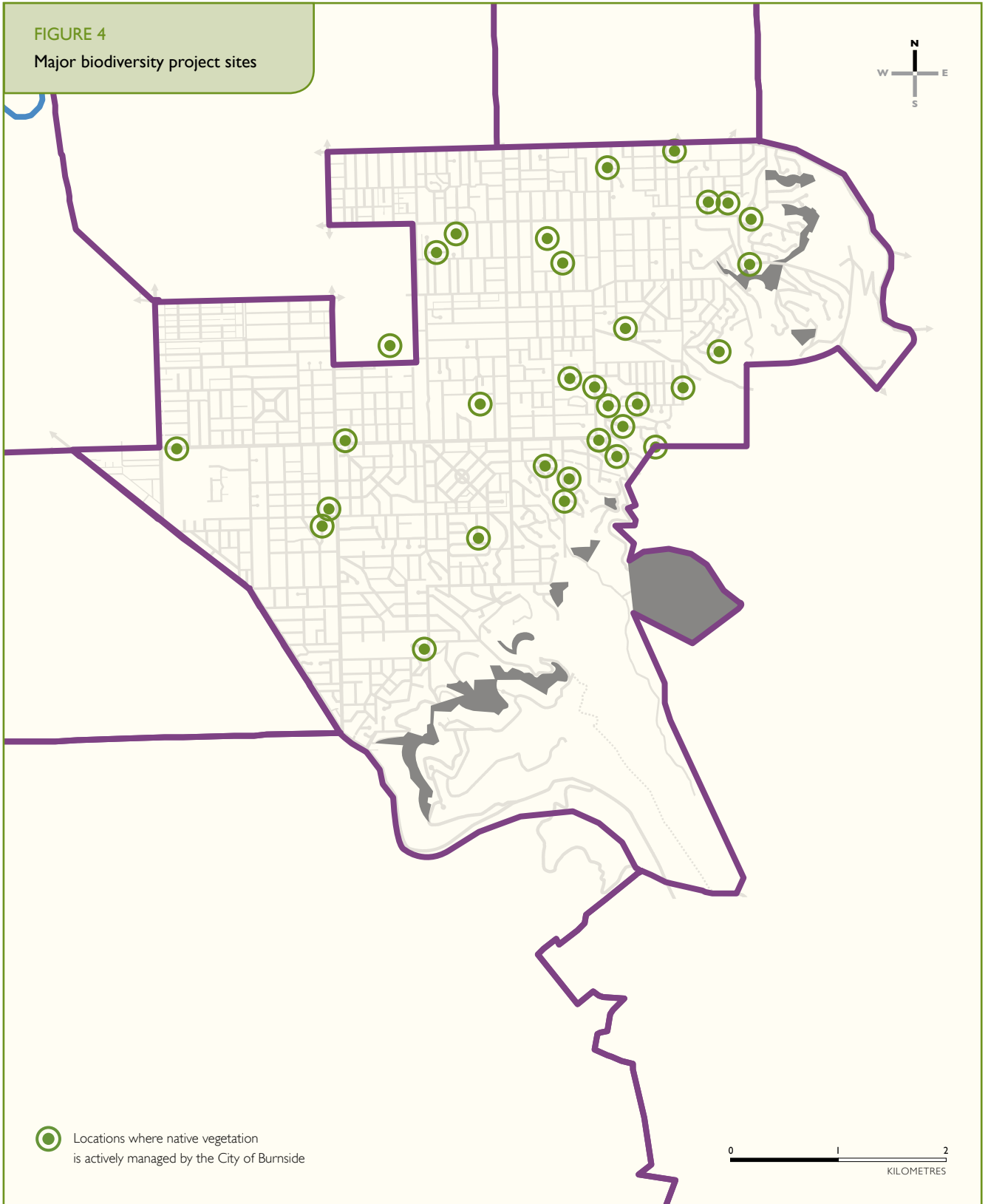
Action 63

- MANAGE AND MAINTAIN ALL PUBLIC AREAS WITH CONSIDERATION OF BIODIVERSITY PRINCIPLES.

Action 64

- SELECT STREETS THAT COULD BECOME 'NATURE STREETS', ENGAGE RESIDENTS TO PLANT INDIGENOUS PLANTS IN THEIR GARDENS AND TO ASSIST WITH HABITAT DEVELOPMENT ON VERGES.

FIGURE 4
Major biodiversity project sites





5. Community education and participation

Education is the key to the development of urban native habitat within residential backyards.

COMMUNITY AWARENESS OF BIODIVERSITY

Increasing biodiversity within the City will rely on residents increasing biodiversity within their own backyards. Education is the key to the development of urban native habitat within residential backyards. Council can do various things to raise community awareness such as:

- provide information on the Council's website
- provide interpretation signs within reserves and parks (significant areas) explaining the importance of native plants as habitat for wildlife
- supply pamphlets at the Civic Centre and conduct practical workshops detailing ways of increasing biodiversity within backyards and the type of native plants to plant
- mount displays at shopping centres etc.
- conduct information drives at schools, youth centres and other community centres
- encourage residents to erect nest boxes within their backyard
- encourage residents to control domestic pets.





Volunteer involvement provides valuable labour for the Conservation and Land Management Program

Volunteer involvement provides valuable labour for the Conservation and Land Management Program as well as providing learning experiences for the volunteers. Some volunteers are participating for work experience. The participation of volunteers is limited by the resources available for supervision and support.

Action 65

- FOSTER THE WILLINGNESS FOR PEOPLE TO VOLUNTEER FOR BIODIVERSITY WORK BY EMPLOYING A PART-TIME VOLUNTEER SUPERVISOR FOR CONSERVATION AND LAND MANAGEMENT WORK. AS WELL AS BIODIVERSITY WORK, THE SUPERVISOR COULD SUPERVISE WALKING TRAIL DEVELOPMENT.

Most training for volunteers is provided on-the-job although volunteers are invited to attend workshops run by Trees for Life. Many volunteers, both residents and students, would appreciate the opportunity to receive more formal training.

Action 66

- PROVIDE TRAINING FOR VOLUNTEERS AS PART OF AN INTEGRATED PACKAGE OF RESIDENT INFORMATION AND TRAINING.

Education

Bus tours

Bus tours of biodiversity sites for residents have been organised every autumn and spring since 2004. A total of 18 have so far been run. On average there are 14 people

participating in each tour. There are two different itineraries – one for sites south of Greenhill Road and one for sites north of Greenhill Road.

Action 67

- BUS TOURS FOR RESIDENTS, STAFF AND COUNCILLORS SHOULD BE CONTINUED AS A REGULAR ACTIVITY.

Brochures

The City of Burnside has produced several brochures explaining Council's work with local biodiversity. None of these are currently in print. There is a need for a comprehensive series of brochures covering all aspects of biodiversity relevant to Burnside. Subjects could include:

- biodiversity site map
- indigenous trees in Burnside
- native flora in Burnside
- native fauna in Burnside
- managing possums
- native flora in home gardens
- specific information about major biodiversity sites in Burnside
- vegetation management and fire
- feral animals and their management
- feral plants and their management
- mistletoe management.

Action 68

- COUNCIL TO PRODUCE A SERIES OF BROCHURES ON BIODIVERSITY IN BURNSIDE.

Workshops and lectures

Council staff are sometimes invited to speak at meetings and conferences. Presentations have recently been made about biodiversity work in Burnside to various groups including the Burnside Historical Society; Australian Network for Plant Conservation; Adelaide University –

ISSUES AND RECOMMENDATIONS

Volunteers

Volunteers help with conservation and land management through the Council's volunteer program and through various not-for-profit and government agencies. The input from volunteers and the cost of their supervision is shown below in Table 5.

TABLE 5: VOLUNTEERS AND SUPERVISION			
ORGANISATION	SITES	PERSON/DAYS/ ANNUM	SUPERVISION COST
City of Burnside	Nursery, 3 urban sites	100	20 person days
Trees for Life	7 Hills Face sites, 1 urban	20	\$4000
Our Patch	4 urban sites	20	Minimal, NRM board funded
Walking Federation	Hills Face walking trails	16	Minimal



Landscape Architecture students; Australian Institute of Landscape Architecture; Friends of the Botanic Gardens; and Adelaide City Council residents. Delivering presentations to groups is a good way of informing the wider community about biodiversity work in Burnside and should continue.

Action 69

- SUPPORT AND ENCOURAGE STAFF AND VOLUNTEERS TO MAKE PRESENTATIONS AND PARTICIPATE IN COMMUNITY AND PROFESSIONAL WORKSHOPS.

Biodiversity Week

From time to time Burnside staff organise site visits and talks to residents to mark Biodiversity Week. This has included 'Night Stalks' to look for possums and other wildlife, evening presentations, field walks, and lectures.

Biodiversity Week is a good opportunity to cooperate with adjoining councils to prepare an interesting and varied program for residents. Biodiversity Week is generally held in September of each year.

Action 70

- CONTINUE TO RUN A REGULAR PROGRAM OF BIODIVERSITY AWARENESS EVENTS PARTICULARLY IN SUPPORT OF BIODIVERSITY WEEK.

Web-based information

The Council's website has information about biodiversity management under 'Conservation and Land Management'. This includes the biodiversity site map, information about sites and standards for biodiversity management in Burnside. Council also has extensive possum

management information on the website. The website needs to be continually updated with site, flora and fauna photographs. An interactive map would also add to its resource value.

Action 71

- ENHANCE AND MAINTAIN THE BIODIVERSITY PAGE ON COUNCIL'S WEB SITE, INCLUDING LINKS TO OTHER RELEVANT GOVERNMENT AND NON-GOVERNMENT ORGANISATIONS.

Biodiversity advice and assistance

Council receives several requests each year for information and material assistance relating to biodiversity. These requests are for assistance with:

- student projects (information is provided)
- verge planting projects (weeds are sprayed and plants are provided)
- residential planting (information provided and plants provided if available and resident asked for donation to contribute to covering cost of plants).

Action 72

- BUILD LINKAGES TO EXISTING PROGRAMS AND AGENCIES SUCH AS BUTTERFLY CONSERVATION, SUSTAINABLE LANDSCAPES AND TREES FOR LIFE TO IMPROVE ASSISTANCE TO STUDENTS, COMMUNITY GROUPS AND RESIDENTS WITH BIODIVERSITY RELATED PROJECTS.

Working with tertiary education institutions

The work on urban biodiversity undertaken by the Conservation and Land Management Team is of a standard that is second-to-none in South Australia. Staff members often receive requests from students and

graduates for work experience that will improve their opportunities for employment. Staff also receive requests for advice or input into student project or thesis work. For several years the City of Burnside has employed trainees and, from time to time, have hosted TAFE students in work experience placements. The experience received at Burnside has been instrumental in the success of the biodiversity site program at the City of Adelaide.

The ability of field staff to provide training is limited by the small size of the team. The ability of office staff to work with students on research projects is likewise limited.

Action 73

- FORMALISE AN INTERNSHIP/TRAINEESHIP PROGRAM FOR CONSERVATION AND LAND MANAGEMENT AT BURNSIDE.

Action 74

- PROMOTE AND ASSIST WITH RELEVANT ECOLOGICAL RESTORATION AND BIOLOGICAL RESEARCH AT UNIVERSITIES AND OTHER AGENCIES.



6. How do we proceed?

There is a need for a local government agency to oversee the achievement of biodiversity benchmarks.

IMPLEMENTING THE BURNSIDE BIODIVERSITY STRATEGY

This section identifies the key processes and activities within Council that influence biodiversity outcomes in the City.

It does not specify biodiversity management needs at a site scale but rather a broader landscape perspective and focuses on medium- to long-term planning and management programs for implementation.

Benchmarking, monitoring and operational guidelines

National benchmarking

The Australian Department of Environment and Water Resources has proposed a five-step benchmarking system to track performance towards conserving local biodiversity (Department of the Environment and Water Resources 2007). While the benchmarks have been defined, there is currently no organisation with responsibility for certifying the benchmark levels and for tracking and reporting on





A more formal monitoring and record keeping regime would improve the tracking of progress

governments and larger non-government organisations are based on the number of seedlings planted, kilometres of direct seeded rows, amount of native seed collected, kilometres of fencing erected, the area of vegetation protected and the numbers of partners and volunteers worked with. These figures are easy to collect but they do not provide a measure of ecological function and security of species and populations. They say nothing about the quality of the work done.

As there are no widely adopted industry standards for biodiversity work it is necessary for Burnside to adopt its own standards to reflect best practice in the vegetation management industry. Measures need to relate to the main components of biodiversity. See Table 6, below.

Whilst the progress at biodiversity sites in Burnside is generally self-evident and photographic comparisons bear this out, a more formal monitoring and record keeping regime would improve the tracking of progress. It needs to be remembered, however, that monitoring and record keeping is time consuming and should be kept to the minimum.

Records kept at present are:

- planting records
- opportunistic photographic record

- photopoints begun 2005
- volunteer activity records.

In addition to these, the following regularly updated records could be kept:

- master list of indigenous species present in Burnside to be reviewed every five years, list to contain:
 - remnant locations or observation sites (for animals)
 - population size at each site
 - assessment of conservation status
- GIS mapping of all biodiversity work sites, categorised as to ecosystem type or revegetation type, e.g.
 - remnant bushland – protection/ regeneration only
 - remnant bushland – supplementary planting
 - degraded remnant with planting
 - planting with remnant protection
 - planting
- measures of site quality linked to each site including area, vegetation type, species diversity, woody weed level, herbaceous weed level
- GIS mapping of all as yet un-worked natural areas, categorised as:
 - good quality
 - slightly degraded
 - very degraded
 - mostly weeds
 - all weeds
- Length and condition of walking trail.

the performance of local government with respect to biodiversity. There is a need for a local government agency to oversee the achievement of these benchmarks (in the same way that the International Council for Local Environment Initiatives does with water and energy benchmarks).

Action 75

- COUNCIL SHOULD ADVOCATE FOR AN APPROPRIATE BODY TO OVERSEE THE ACHIEVEMENT OF BIODIVERSITY BENCHMARKS.

Local benchmarking

Generally, measures of vegetation management used by federal and state

TABLE 6: COMPONENTS AND MEASURES OF BIODIVERSITY

COMPONENT	MEASURE
Number of indigenous species	<ul style="list-style-type: none"> • inventory of local species, locations and conservation rating • population numbers and security
Genetic diversity	<ul style="list-style-type: none"> • all remnant populations conserved • plantings to include stock from many local parents • planting success—establishment, regeneration
Ecosystem diversity	<ul style="list-style-type: none"> • remnant habitat area • revegetated habitat area • vegetation quality at each site
Sustainability	<ul style="list-style-type: none"> • area of habitat • connectivity of habitat

Action 76

- DEVELOP A RECORD SYSTEM TO KEEP AS MUCH RELEVANT INFORMATION AS POSSIBLE.

Action 77

- MAINTAIN AND UPDATE THE FLORA AND FAUNA LISTS FOR THE CITY, INCLUDING ASSESSMENTS OF CONSERVATION STATUS.

Operational guidelines

Operational guidelines are required for biodiversity site work and land management in general. For work in degraded native vegetation areas, many not-for-profit and local government agencies follow the principles and practices promulgated by E and J Bradley (1988) known as 'the Bradley Method' (Appendix 8). This approach is well known in Australia, and in those parts of the world with similar vegetation management issues such as California and South Africa. (San Francisco Recreation Department, (2006). In Burnside, the Bradley approach is applied to the better quality areas within the Hills Face and works well as a method for volunteers.

The three principles of the Bradley Method are to:

- remove weeds from the best quality areas first and work outwards.
- clear weeds at a rate determined by natural regeneration and resources available to follow-up. Don't over-clear.
- make minimal disturbance to soil and native plants as you work.

Most of the sites in Burnside are too degraded for strict adherence to the Bradley Method. Sites in Burnside usually consist mostly of weeds with only a few surviving

indigenous plants. In such cases, standards need to be developed that encourage the eradication of weeds whilst protecting remnant indigenous plants, the fostering of natural regeneration, the planting of propagated stock and the maintenance of aesthetic appearance at high profile sites.

As best practice standards have not been developed elsewhere for urban biodiversity, the City of Burnside has developed a set of audit standards which are applied during inspections (Appendix 6). These standards provide guidelines to field staff and contractors and are the basis for field inspections of work.

Action 78

- ALL RECORDS INCLUDING SITE ACTION PLANS AND AUDITS SHOULD BE LINKED TO SITES ON COUNCIL'S GIS.

Reporting and review

Records and site audits can be used as a basis for regular reporting.

Progress in implementing this Biodiversity Strategy will be reported at the end of each financial year as part of Council's annual report process.

The Strategy will be reviewed annually and budget allocations made, as part of Council's corporate planning and budgetary processes. The Strategy will be subject to a comprehensive review, with community consultation, in five years' time.

Action 79

- MONITOR, REVIEW AND REPORT ON BIODIVERSITY INDICATORS, TRENDS AND IMPACTS ON BIODIVERSITY OVER TIME.

Relationship to other departments and agencies

Implementation of many of the recommendations in this Strategy will require the cooperation of other departments in the City of Burnside administration as well as with neighbouring councils, state government agencies and non-government organisations.

In the summary of recommendations, the relevant City of Burnside departments are listed. The departments and sections which will have most involvement with the implementation of this strategy are:

- open space and recreation and the conservation and land management field unit within it
- development and policy
- strategy and environment.

Action 80

- ENSURE THAT THE CITY OF BURNSIDE BUSHFIRE MANAGEMENT PLAN IS ALIGNED WITH THIS BIODIVERSITY STRATEGY.

Action 81

- ADVOCATE FOR ADEQUATE RESOURCING TO ENABLE AN EFFECTIVE SERVICE TO BE PROVIDED BY THE CONSERVATION AND LAND MANAGEMENT FIELD UNIT.

Action 82

- ORGANISE THE CONSERVATION AND LAND MANAGEMENT FIELD UNIT TO MAXIMISE THE RETENTION OF STAFF AND THE DEVELOPMENT OF CORPORATE KNOWLEDGE.

The state government agency with the most relevance to this Strategy is the

Adelaide and Mt Lofty Ranges NRM Board. Links to their developing plans and programs will be essential.

Action 83

■ MAINTAIN AND DEVELOP GOOD NETWORKS WITH OTHER COUNCILS, STATE GOVERNMENT AGENCIES AND NON-GOVERNMENT ORGANISATIONS.

Resource allocation

Statutory requirements for land management include declared weed control, feral animal control and fire hazard reduction. Community requirements for land management include aesthetics, nature conservation, views, and the walking trail network. These involve Council land management expenditure regardless of biodiversity outcomes.

Successful land management leads to a managed vegetation system that satisfies as many of these requirements as possible but also uses local native flora to develop a vegetation system that maintains biodiversity and is sustainable at a lower cost in the long term. Failure to devote the appropriate skilled management input in the initial stages will lead to loss of native flora and fauna, chronic weed infestations and higher on-going management costs. The key to successful native vegetation conservation, restoration, establishment and management is timeliness of operation by skilled and knowledgeable people.

Native flora and fauna management and restoration is a skilled occupation. Not only is a lot of generic technical skill required, but field operators also need the detailed local site knowledge that comes only from years of experience at a locality. For this

reason it is essential that a land management field team be of a size sufficient to embody Burnside local knowledge over an extended period of time.

The application of appropriate knowledge and skill to site development is particularly lacking in the Hills Face. Although budget allocations are adequate for a gradual improvement of site quality, the dependence on contractors for the majority of the on-ground work means that the necessary skills and local knowledge are not always applied to sites in a timely manner; sites do not develop as they should and opportunities are lost. This problem could be overcome by employing a staff member to train and supervise contractors or by directing some of the resources presently spent on contractors to the employment and development of skilled staff.

Another resource allocation issue arises from the frequent requirement to spend funds for vegetation work associated with creek and other engineering projects in the year of construction. This does not provide an adequate lead-time to propagate appropriate plants and there is pressure to plant sites before weed levels are suitably reduced. The poor weed control then creates the need for skilled management to rescue the site in future years. Usually no additional funds are available for this. It needs to be recognised that vegetation development is a long-term process, not a short-term project.

Resources for conservation and land management work come from several budget areas:

- urban biodiversity – general maintenance
- Hills Face biodiversity – project work

- fire and weed budgets managed by the General Inspector
- watercourse management budgets
- short-term project budgets (capital/strategic).

Together, these budget allocations represent a resource base for land management, which enables real progress to be made at all sites over time. While work at urban sites has generated several hectares of high quality revegetated habitat in the last 10 years, progress in the Hills Face has been patchy. The Hills Face has improved markedly in the area of woody weed and fire hazard reduction, but in the process several species of native flora have been lost from Mt Osmond reserves and habitat value has reduced.

The success of urban sites in Burnside is due to the employment and training of staff members who are able to apply knowledge and skills in a timely manner throughout the year.

At present almost all of the land management work in the Hills Face is done by contractors, managed by:

- Senior Inspector responsible for fire fuel reduction zones and the removal of proclaimed weed species.
- Group Team Leader of Conservation and Land Management responsible for the reserve land away from the boundaries and for walking trails.

For fire hazard reduction and woody weed control, the contractors presently working on Council's fire and proclaimed weed program do excellent work. It is the next stage, that of developing a stable, easy to manage and lower flammability vegetation, that is difficult to achieve with contractor

assistance. Small but vital jobs usually do not get done at all, and a lack of familiarity with Burnside local flora often leads to losses of native flora when management operations are performed. Many contractors require careful supervision which is time consuming for Council staff and enough time for on-site supervision and training can not always be found. With current resource allocation arrangements we can expect a gradual improvement in canopy condition and a gradual reduction in major weed infestations but quality understorey will not develop and the ground layer will still be dominated by flammable herbaceous weeds. Habitat will not be of high quality. Better results would be achieved if there were a permanent staff presence in the Hills Face, with contractors continuing to play a vital role but supervised by a working Hills Face team leader. The present Council nursery provides a good base for conservation and land management work. With a small amount of redevelopment, the nursery would also provide an adequate base for a Hills Face team and a volunteer program.

An appropriate staffing level for conservation and land management can be

judged by determining the maintenance staff level that would be required for Burnside if all the Hills Face and urban habitat areas had been developed to a high standard and only on-going maintenance were required. If the vision presented in this strategy were realised, there would be about 150ha of Hills Face and about 10ha of urban natural habitat to manage. If this were all in good condition, management could be achieved by six field employees with some funding for contractors to cut fire-breaks in early summer.

Council should consider combining resources from all conservation and land management sources to employ staff to manage Hills Face and watercourse sites as well as urban sites.

AN IDEAL CONSERVATION AND LAND MANAGEMENT PROGRAM—‘A WISH LIST’

These considerations leads to the following idealised staff structure for an effective Conservation and Land Management Program under Council’s Department of Open Space and Recreation. With existing resources, a start can be made towards

developing this team structure by re-arranging existing allocations.

The diagram on the facing page presents staffing and project initiatives that could be considered in future budgets to work towards a best practice Conservation and Land Management Program in Burnside. These initiatives are presented as reasonable responses to the scale of the task in Burnside. This list does not include site-specific projects that may arise as a result of urban parks master planning. Costs are indicative and up-to-date cost estimates can be presented at the time of budget considerations.

Ideal team structure

The team structure in Figure 6 would be in a position to deliver an effective Conservation and Land Management Program in Burnside, ensuring high quality site management, communication with other Council staff and a high level of community engagement.

Of the five proposed additional field staff, two can be funded by re-arranging existing budget allocations. Existing contractor and agency employee allocations amount to

TABLE 7: STAFFING AND PROJECT INITIATIVES	
PROJECT/OUTCOME	RESOURCES REQUIRED/COST
Improved Hills Face management—development of sustainable vegetation communities	Additional land management officer—\$50,000 pa
Improved biodiversity through community engagement including Burnside nature linkages	Nursery and volunteer supervisor—\$50,000 pa
Provide assistance for land management in Burnside and develop land management skill base in metropolitan Adelaide	Trainee—\$35,000 pa
Improve connectivity, nature conservation and access by strategic land acquisition	Not quantifiable—need to respond to opportunities as they arise
Improve nursery facility to accommodate its use by volunteers	Potting area, sink, growing area, irrigation upgrade—\$20,000
Large interpretive sign at Linden Gardens—artwork and sign	\$3000
General signage to provide information about biodiversity sites	10 hoop signs and 25 smaller signs—\$20,000 (over several years)
Protective fences (mostly post and rail) to effectively and aesthetically delineate urban biodiversity sites	250 m of recycled timber post and rail—\$30,000 (over several years)
Brochures	Artwork and printing for 12 brochures and the natural heritage map—\$30,000 (over several years)
Walking trail program	Subject of a strategy report to follow but includes several proposals for construction projects including Waterfall Gully Reserve Boardwalk and Steps between Wyatt Rd and Waterfall Gully Road

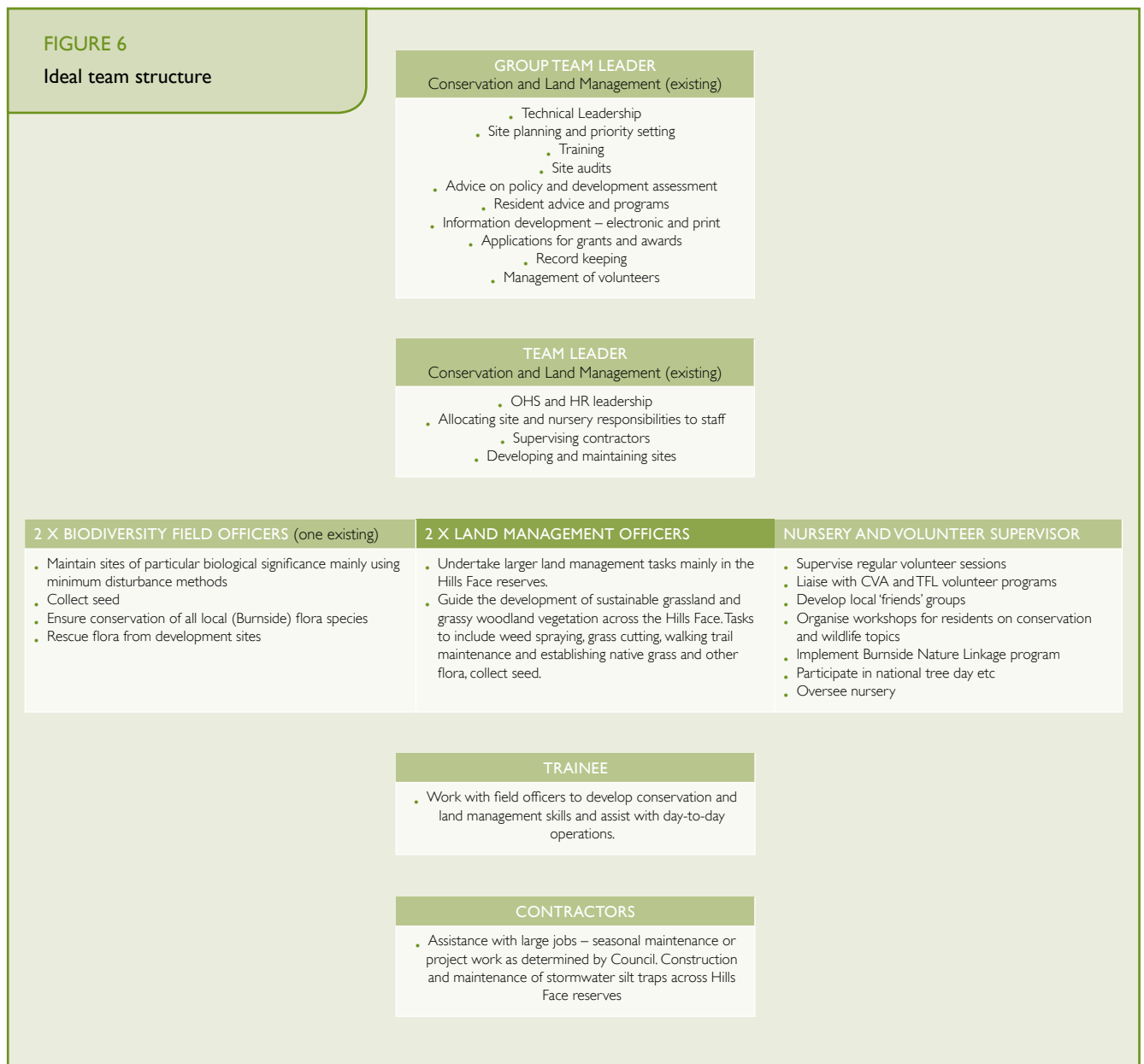
\$134,000. At present, this buys less than two person-years of contractor labour. This money could be used to employ two field staff (for \$100,000 in total) with \$34,000 remaining for contractor assistance.

A strong field team would support the appointment of a trainee who would assist in all aspects of conservation and land management and eventually make a contribution to best practice in other areas.

Additional allocations would be required to appoint a further land management officer and a nursery and volunteer supervisor.

FIGURE 6

Ideal team structure





7. What for the future?

A shared picture is needed of what Burnside would look like if it were to continue to advance in becoming a nature-friendly city.

SHARING A VISION Vision 2020

Vision 2020 states:

Our Strategic Direction is to protect and conserve the environment, living in harmony with it to ensure that future generations can experience what we value so highly today.

In addressing the various aspects of the environment, a supplementary Strategic Direction could be written to apply to biodiversity:

Our Strategic Direction is to protect and conserve our indigenous plants, animals and living ecosystems, the environment they live in and the way they interact, so that biodiversity is sustained and enhanced.

For the City of Burnside to follow this Strategic Direction, a shared picture is needed of what Burnside would look like if it were to continue to advance in becoming a nature friendly city. The attributes of a nature-friendly Burnside would be:



Corridors and 'habitat stepping stones' are key features of the biodiversity vision for Burnside.

- native vegetation conserved, established wherever possible and managed to minimise weeds and fire hazard and to maximise conservation of wildlife and rare plant species
- a nature-aware community that provides habitat in gardens, owns pets responsibly and drives with wildlife-awareness
- sustainably-managed woodlands maintained and extended as an offset for Council's carbon emissions
- a Council working cooperatively with community and other levels of government to develop and implement policies and systems to guide the built form towards ecological sustainability.

corridors, improved access for management, education, community involvement and wellbeing, aesthetics, stormwater management and fire prevention. This potential can be realised by improving the management of existing reserves, by acquiring additional land to link and buffer existing habitat areas, and by encouraging private owners of habitat areas to enter into heritage agreements to secure the future of the habitat.

Depending on the land required, land can be acquired by the purchase of:

- whole undeveloped property (expensive)
- whole property, amalgamation of desired part of original property with adjoining reserve and selling the balance of the property
- whole property, creating a reserve from part of the property and selling the balance of the reserve
- part of property and amalgamation with adjoining Council reserve and also by bequest.

The first three of these require Council to act quickly when a property comes onto the market. The other two can only be achieved by negotiation and raising the awareness of property owners.

Increasing habitat connectivity: reserve development

Corridors and 'habitat stepping stones' are key features of the biodiversity vision for Burnside. Corridors and stepping stones are important as they provide habitat, food and nesting resources, and serve to link isolated areas of important habitat. Linking reserves also provides opportunities for recreational linkages.

Opportunities in the urban reserve system for the development of corridors and habitat stepping stones is now limited to a few areas of existing reserves, creek zones and very few larger properties that could be subdivided in the future. In urban areas, the retention of indigenous trees and habitat development in private gardens will be essential to the maintenance and extension of all but the most generalised fauna species.

The Hills Face reserve system has much more potential for improvement, for biodiversity as well as for recreation



- a linked reserve system across the Hills Face incorporating all ecosystem types and providing a walking and bicycle trail network that is well planned and maintained to enhance natural values and not compete with them
- linked open spaces follow the creeks into the residential areas with creek lines well vegetated for habitat, water quality and stream stability
- urban parks with areas of restored native forest and woodland
- remnant native trees conserved and regenerating at appropriate sites across residential areas

Increasing habitat connectivity: private land

Improving the management of private land can assist with the conservation and development of habitat and habitat linkages.

In the Hills Face Zone, where properties are generally steep and difficult to manage, property holders can be assisted to improve their knowledge and skill through programs such as the NRM property management program. Council could also assist with supply of information and appropriate planting stock for property holders. In urban areas, property values all but preclude the conservation of native vegetation on private property. There is, however, scope to improve habitat connectivity in urban areas by encouraging the retention and establishment of indigenous trees in the areas where

indigenous trees are already prevalent and in areas that link these existing canopy areas.

Council could also assist with information about habitat gardening. At present, volunteers produce local plants to give away to residents. With improved organisation and facilities this could be increased and become a targeted 'Burnside Nature Link' or 'Gardens for Wildlife' program.

RECOMMENDATIONS

To achieve this vision, it is proposed that biodiversity conservation and management in Burnside be guided by the eight key themes presented in Table 8. A recommendation has been made for each theme and all the actions presented in the Strategy relate to one of the recommendations.

The entries in the first column refer to the approaches presented in the '2020 Vision'. The key themes, recommendations and actions proposed in this Strategy are presented together in the Summary section, to follow.

These recommendations and actions can be implemented at a level determined by the priorities of Council during budget deliberations. Outcomes that can be expected at various funding levels are presented in Section 8. Also listed are various discrete biodiversity projects that could be considered.

TABLE 8: BIODIVERSITY, THEMES AND RECOMMENDATIONS

REFERENCE TO 'VISION 2020'	THEME	RECOMMENDATION UNDER THIS THEME
All	Improving our knowledge	Encourage research into restoration of degraded habitats and increase specific knowledge of the natural history of Burnside, including its threatened species
A1, A4, A6	Building connected habitat areas	Minimise land fragmentation and encourage habitat connectivity in Hills Face and watercourses
A3, A5, A6, A7	Conservation management	Adopt, implement and promote best practice natural area protection and management
All	Monitoring	Research and monitor impacts and trends on biodiversity over time and alter management as required
A3, A4	Awareness and education	Promote and establish a biodiversity-aware staff and community, including educating the community on the importance of ecosystem services.
All	Fostering partnerships	Work collaboratively with individuals, community groups, agencies, organisations and the wider community towards the protection, management and restoration of biodiversity
A4	Legislation and regulation	Promote urban development and other land uses that avoid the loss of biodiversity and preferably achieve a net gain
A4, A7	Systems and processes	Ensure Council's administrative arrangements and structure support endorsed actions of the Biodiversity Strategy



8. Summary

There are eight themes defining the future of biodiversity management for the City of Burnside. Each theme is presented with its corresponding actions and recommendations.



RECOMMENDATIONS AND ACTIONS

Recommendations and actions that have been discussed in this Strategy are grouped here under the eight themes introduced in Section 7:

- improving our knowledge
- building connected habitat areas
- conservation management
- monitoring
- awareness and education
- fostering partnerships
- legislation and regulation
- systems and processes.

IMPROVING OUR KNOWLEDGE

ENCOURAGE RESEARCH INTO RESTORATION OF DEGRADED HABITATS AND INCREASE SPECIFIC KNOWLEDGE OF THE NATURAL HISTORY OF BURNSIDE, INCLUDING ITS THREATENED SPECIES

ACTION NO.	THEME/RECOMMENDATION/ACTIONS	PRIORITY	RESPONSIBILITY
77	Maintain and update the flora and fauna lists for the City, including assessments of conservation status	Ongoing	OS&R
74	Promote and assist with relevant ecological restoration and biological research at Universities and other agencies	Ongoing	OS&R
26	Determine threatened species management needs in Burnside and establish an action plan for implementation	High	OS&R

BUILDING CONNECTED HABITAT AREAS

MINIMISE LAND FRAGMENTATION AND ENCOURAGE HABITAT CONNECTIVITY IN HILLS FACE AND WATERCOURSES.

ACTION NO.	THEME/RECOMMENDATION/ACTIONS	PRIORITY	RESPONSIBILITY
3	Negotiate with owners of strategic sections of creek line for the eventual acquisition and development as linear riparian reserve in order to develop corridors for habitat (as well as possible recreational links)	Low	OS&R
1	Identify and approach the owners of urban properties that contain native vegetation with a view to encouraging the conservation of these areas	Ongoing	OS&R P&D F&A
62	Identify biodiversity improvement opportunities in any subdivisions that may occur particularly in the properties that still exist in Glenunga (e.g. Glenside Hospital, Mineral Foundation, Glenunga High School)	Ongoing	P&D OS&R
40	Provide incentives for the establishment of trees in appropriate locations in creek zones for the conservation of indigenous tree canopy corridors	High	P&D
7	Develop and implement guidelines for conserving the remaining large patches of native woodland in the Hills Face	High	OS&R P&D F&A
31	Where adjoining property holders agree, isolated remnant trees should have a different treatment of the verge in which they occur. On these verges, Kikuyu should be replaced with native ground flora, with wattles and native apricot as appropriate to the site	Low	CALM
34	As part of the Open Space Strategy, identify allotments that cannot be built on without removing extensive numbers of indigenous trees and consider purchasing for the provision of open space, if required	Ongoing	P&D F&A
60	Maximise opportunities for biodiversity improvement through stormwater detention basins and creek-zone stabilisation projects and plan for indigenous vegetation aspects from an early stage of project development	Ongoing	S&E OS&R

KEY

PRIORITY

High	Completed within 2 years
Medium	Completed within 2–4 years
Low	Completed within 4–5 years
Ongoing	Carried out on a regular basis

RESPONSIBILITY

OS&R	Open Space and Recreation	IT	Information Technology
S&E	Strategy and Environment	CALM	Conservation and Land Management Field Unit
P&D	Planning and Development	ARB	Arboriculture Field Unit (Operation Services)
F&A	Finance and Administration	PG	Parks and Gardens Field Unit (Operation Services)
A&C	Assets and Capital Works	CW	Civil Works Field Unit (Operation Services)

CONSERVATION MANAGEMENT

ADOPT, IMPLEMENT AND PROMOTE BEST PRACTICE NATURAL AREA PROTECTION AND MANAGEMENT.

ACTION NO.	THEME/RECOMMENDATION/ACTIONS	PRIORITY	RESPONSIBILITY
63	Manage and maintain all public areas with consideration of biodiversity principles	Ongoing	P&G
29	Where it is appropriate, smaller growing local <i>Eucalyptus</i> species should be tried as street trees – namely <i>Eucalyptus cosmophylla</i> , <i>Eucalyptus fasciculosa</i> and <i>Eucalyptus porosa</i>	Medium	OS&R ARB
64	Select streets that could become 'nature streets', engage residents to plant indigenous plants in their gardens and to assist with habitat development on verges	Low	OS&R S&E
13	Any proposed works that affect roadsides and road reserves in the Hills Face should be assessed for impact on native vegetation and remedial action taken to mitigate the effects	Ongoing	WKS P&G OS&R
30	Where a species is indigenous to Burnside, forms and cultivars of that species should be avoided as well as any related species that are likely to hybridise with the local population	Ongoing	P&G OS&R
38	Woody weeds should be removed around indigenous trees	Ongoing	CALM P&G
11	Construct additional trash racks, sedimentation basins and stabilised watercourses to manage water and sediment entering reserves	Medium	S&E OS&R CW
33	Hills Face areas should be regularly patrolled and staff authorised to remove all self-sown seedlings of weed tree species as they are found	Low	OS&R CW P&G
37	The percentage of mistletoe removed from a tree should be determined by the effect the mistletoe is having on the tree	Ongoing	ARB CALM
49	Information be provided to the public about termites – managing threats and understanding their role in nature	Ongoing	CALM CW
56	Provide information to residents about backyard habitat development, nest-box provision, dog and cat enclosures, minimising chemical use	Ongoing	OS&R
57	Maximise habitat features in council planted sites – local plants, diversity of flower types and times, shelter and ground mulch layer	Ongoing	CALM P&G
58	Manage woody weeds to minimise disruption to wildlife habitat	Ongoing	OS&R CALM P&D (inspector)

MONITORING

RESEARCH AND MONITOR IMPACTS AND TRENDS ON BIODIVERSITY OVER TIME AND ALTER THE MANAGEMENT AS REQUIRED.

ACTION NO.	THEME/RECOMMENDATION/ACTIONS	PRIORITY	RESPONSIBILITY
79	Monitor, review and report on biodiversity indicators, trends and impacts on biodiversity over time	Ongoing	OS&R
76	Develop a record system to keep as much relevant information as possible	Medium	OS&R

AWARENESS AND EDUCATION

PROMOTE AND ESTABLISH A BIODIVERSITY AWARE STAFF AND COMMUNITY, INCLUDING EDUCATING THE COMMUNITY ON THE IMPORTANCE OF ECOSYSTEM SERVICES.

ACTION NO.	THEME/RECOMMENDATION/ACTIONS	PRIORITY	RESPONSIBILITY
71	Enhance and maintain the biodiversity page on Council's website, including links to other relevant government and non-government organisations	Medium	OS&R IT
6	Provide information to residents about avoiding weedy garden plants. This could include liaising with the Sustainable Gardens project at the Botanic Gardens	Medium	OS&R
21	Any materials or plants proposed in private development, which potentially compromise biodiversity, should be discouraged through community education	High	P&D OS&R
24	Indigenous cultural awareness training sessions should be held for staff and for the community	Ongoing	F&A OS&R
66	Provide training for volunteers as part of an integrated package of resident information and training	Medium	OS&R CS
68	Council to produce a series of brochures on biodiversity in Burnside	Medium	OS&R
67	Bus tours for residents, staff and Councillors should be continued as a regular activity	Ongoing	OS&R S&E
69	Support and encourage staff and volunteers to make presentations and participate in community and professional workshops	Ongoing	OS&R
70	Continue to run a regular program of biodiversity awareness events particularly in support of Biodiversity week	Ongoing	S&E OS&R
27	Provide information on the indigenous trees of Burnside – recognition and importance	Medium	OS&R
39	A fact sheet should be prepared about mistletoe, its role in nature and its management	Medium	OS&R

KEY

PRIORITY

High	Completed within 2 years
Medium	Completed within 2–4 years
Low	Completed within 4–5 years
Ongoing	Carried out on a regular basis

RESPONSIBILITY

OS&R	Open Space and Recreation	IT	Information Technology
S&E	Strategy and Environment	CALM	Conservation and Land Management Field Unit
P&D	Planning and Development	ARB	Arboriculture Field Unit (Operation Services)
F&A	Finance and Administration	PG	Parks and Gardens Field Unit (Operation Services)
A&C	Assets and Capital Works	CW	Civil Works Field Unit (Operation Services)

FOSTERING PARTNERSHIPS

WORK COLLABORATIVELY WITH INDIVIDUALS, COMMUNITY GROUPS, AGENCIES, ORGANISATIONS AND THE WIDER COMMUNITY TOWARDS THE PROTECTION, MANAGEMENT AND RESTORATION OF BIODIVERSITY

ACTION NO.	THEME/RECOMMENDATION/ACTIONS	PRIORITY	RESPONSIBILITY
4	Continue and further develop the existing volunteer program that propagates plants for residents and support this with appropriate information	Ongoing	OS&R
2	Develop an assistance package about creek management involving information, consultation and plant supply	Medium	S&E OS&R
12	Prepare a Youth Recreational Facilities Study to indicate demand and possible locations for BMX-type bicycle facilities	Medium	OS&R CS
14	Council to work with other metropolitan Councils to develop a uniform site marking system that is simple to apply and will be easily recognised by field workers	Medium	OS&R
72	Building linkages to existing programs and agencies such as Butterfly Conservation, Sustainable Landscapes and Trees for Life to improve assistance to students, community groups and residents with biodiversity related projects	Ongoing	OS&R CS
83	Maintain and develop good networks with other councils, state government agencies and non-government organisations	Ongoing	OS&R
65	Foster the willingness for people to volunteer for biodiversity work by employing a part-time volunteer supervisor for Conservation and Land Management work. As well as biodiversity work, the supervisor could supervise walking trail development	Medium	F&A
20	Liaise with the Sustainable Landscapes Project to prepare a list of exotic and Australian plants that can be used in landscaping without compromising local native flora	Medium	OS&R
25	Liaise with Kurna people to incorporate Kurna cultural information into interpretive signage, including Kurna names for reserves	Medium	OS&R
9	Encourage weed management on properties adjoining Hills Face reserves by providing information and technical assistance to residents	Low	OS&R
59	Work with neighbouring councils to develop regional habitat linkages	Ongoing	OS&R
73	Formalise an internship/traineeship program for Conservation and Land Management at Burnside	Low	F&A

LEGISLATION AND REGULATION

PROMOTE URBAN DEVELOPMENT AND OTHER LAND USES THAT AVOIDS LOSS OF BIODIVERSITY AND PREFERABLY ACHIEVES A NET GAIN

ACTION NO.	THEME/RECOMMENDATION/ACTIONS	PRIORITY	RESPONSIBILITY
28	Encourage development that allows for the co-existence of large indigenous trees	High	P&D
32	With appropriate public notification, the removal of defined weedy exotic tree species from public open space should be approved wherever they directly compete with indigenous trees or threaten other native flora. This should apply even if the tree is larger than 2 metres in circumference and would apply to Olive (<i>Olea europea</i>), Hawthorn (<i>Crataegus</i> sp), Ash (<i>Fraxinus angustifolia</i>), Pine (<i>Pinus halepensis</i> and <i>P. radiata</i>), and Willow (<i>Salix</i> sp)	High	P&D
10	Development approvals should include conditions that protect native flora on adjoining land from damage from dumping of fill or the flow of water and sediment	High	P&D

SYSTEMS AND PROCESSES

ENSURE COUNCIL'S ADMINISTRATIVE ARRANGEMENTS AND STRUCTURE SUPPORT ENDORSED ACTIONS OF THE BIODIVERSITY STRATEGY.

ACTION NO.	THEME/RECOMMENDATION/ACTIONS	PRIORITY	RESPONSIBILITY
80	Ensure that the City of Burnside Bushfire Management Plan is aligned with this Biodiversity Strategy	Medium	P&D (inspector)
22	All materials and plants used in landscaping in Council projects should be assessed for upstream consequences for biodiversity and avoided where there are concerns	Ongoing	OS&R P&G
81	Advocate for adequate resourcing to enable an effective service to be provided by the Conservation and Land Management field unit	Ongoing	OS&R
82	Organise the Conservation and Land Management field unit to maximise the retention of staff and the development of corporate knowledge	Medium	F&A OS&R
35	There is scope to improve the protection of indigenous trees on private property	High	P&D
36	Offer to pay the costs associated with preparing Land Management Agreements for residents wanting to voluntarily protect indigenous trees on their property. Prepare a brochure explaining this	Medium	P&D F&A
15	Reaffirm the existing policy aimed at establishing native vegetation along all creeks on council land	High	OS&R ARB
17	Plan for rehabilitation works in urban relics of Red Gum / Blue Gum forest in Hazelwood Park and Kensington Gardens Reserve	High	P&D OS&R
16	Note strategic sections of privately owned creek for purchase when the opportunity arises	Medium	P&D OS&R
18	Encourage property owners to protect areas of Mallee Box woodland in Skye	Medium	F&A OS&R
19	Encourage property owners to protect areas of native grassland in Auldana	Medium	F&A OS&R
43	Training should be provided to ensure that staff understand the Possum Management Policy and can deal effectively with individual resident problems	High	S&E OS&R
44	Residents should be directed to Council's website and the available information on possum management	Ongoing	F&A
45	An article detailing correct possum management should be submitted within a local newsletter or the local Messenger annually	High	S&E OS&R
46	A brochure should be prepared outlining Burnside's Possum Management Policy	High	S&E OS&R
47	Provide educational pamphlets explaining the natural shy behaviour of snakes, and their preference to retreat from humans in search of shelter if approached	Medium	OS&R

> Continued on next page

KEY

PRIORITY

High	Completed within 2 years
Medium	Completed within 2–4 years
Low	Completed within 4–5 years
Ongoing	Carried out on a regular basis

RESPONSIBILITY

OS&R	Open Space and Recreation	IT	Information Technology
S&E	Strategy and Environment	CALM	Conservation and Land Management Field Unit
P&D	Planning and Development	ARB	Arboriculture Field Unit (Operation Services)
F&A	Finance and Administration	PG	Parks and Gardens Field Unit (Operation Services)
A&C	Assets and Capital Works	CW	Civil Works Field Unit (Operation Services)

SYSTEMS AND PROCESSES

ENSURE COUNCIL'S ADMINISTRATIVE ARRANGEMENTS AND STRUCTURE SUPPORT ENDORSED ACTIONS OF THE BIODIVERSITY STRATEGY.

ACTION NO.	THEME/RECOMMENDATION/ACTIONS	PRIORITY	RESPONSIBILITY
48	Interpretive signage in reserves should explain snake behaviour and counter the negative image attached to Australian snakes	Low	OS&R
50	Encourage cat owners to create cat enclosures housing cats, or keep cats indoors, especially at dawn and dusk and overnight	Medium	OS&R
51	Encourage residents to get cats desexed as they are less likely to wander when desexed	Medium	P&D (inspector)
53	Provide pamphlets detailing correct cat management at the Civic Centre for resident collection	High	P&D (inspector)
52	Create a link on the Council's website informing the public of correct management of domestic cats and dogs	Medium	P&D (inspector)
54	Dense shrubby understorey areas should be established at appropriate locations in reserves to enable native fauna to stay undercover and conceal themselves from potential predators	Ongoing	OS&R CALM P&G
55	In areas of natural habitat, dogs should be kept on leads and not permitted to wander off designated open areas or tracks	Medium	OS&R P&D (Inspector)
75	Council should advocate for an appropriate body to oversee the achievement of biodiversity benchmarks	Low	F&A
78	All records including site action plans and audits should be linked to sites on Council's GIS	Low	OS&R F&A
41	Develop and adopt policies and guidelines for the conservation of tree hollows	Medium	OS&R
42	Develop and adopt policies and guidelines for the conservation of nests in trees during arboricultural works	High	OS&R
23	Provide information to residents near native vegetation to increase awareness of its significance and management	High	OS&R
8	Prepare a revised Hills Face Management Plan, reaffirming the philosophy presented in the 1994 Hills Face Management Plan of native vegetation development and management in Hills Face reserves as a means of fire hazard management as well as for conservation	High	OS&R P&D (inspector)
61	Define biodiversity areas as part of planning for major parks	High	OS&R
5	Prepare a brochure on using native flora for habitat creation in home gardens	Medium	OS&R

KEY

PRIORITY

High	Completed within 2 years
Medium	Completed within 2–4 years
Low	Completed within 4–5 years
Ongoing	Carried out on a regular basis

RESPONSIBILITY

OS&R	Open Space and Recreation	IT	Information Technology
S&E	Strategy and Environment	CALM	Conservation and Land Management Field Unit
P&D	Planning and Development	ARB	Arboriculture Field Unit (Operation Services)
F&A	Finance and Administration	PG	Parks and Gardens Field Unit (Operation Services)
A&C	Assets and Capital Works	CW	Civil Works Field Unit (Operation Services)

Appendix 1: Flora | Native flora



A note on the tables of flora

The tables that follow are based on information from the State Herbarium and from past reserve management plans. They list all the plant species that have been recorded in the City of Burnside since European settlement. In total 730 species are listed of which 390 are indigenous and 340 are exotic. Of the species listed, 118 species have a conservation rating and two species are known to be extinct in the Mount Lofty Ranges.

The list of exotic species contains species that are naturalised in Burnside. This means that these species, having first been introduced by people, now persist in the landscape without human intervention. In most cases, these species have become established in the landscape at the expense of indigenous species.

✓ | Indicates an indigenous species that requires on-going management in order to be maintained in the City of Burnside.

? | Indicates that the species is not known to occur in any Burnside Council reserve land but may still be present in the Cleland Conservation Park at the South-eastern end of the district

P | Indicates that the species has been propagated from local sources and planted on Burnside Council reserve land.

SPECIES NAME	COMMON NAME	FAMILY NAME	CONSERVATION STATUS		DATE	NEEDS MANAGEMENT
			SA	SML		
<i>Acacia acinacea</i>	Wreath Wattle	LEGUMINOSAE			15/09/1963	✓P
<i>Acacia continua</i>	Thorn Wattle	LEGUMINOSAE		U	11/10/1943	?
<i>Acacia dodonaeifolia</i>	Hop-bush Wattle	LEGUMINOSAE	R	R	3/08/1973	?
<i>Acacia dodonaeifolia</i> × <i>Acacia paradoxa</i>		LEGUMINOSAE			1/10/1993	?
<i>Acacia gunnii</i>	Ploughshare Wattle	LEGUMINOSAE	R	R	1/04/1931	✓
<i>Acacia melanoxydon</i>	Blackwood	LEGUMINOSAE			1994	P
<i>Acacia myrtifolia</i>	Narrow-leaf Myrtle Wattle	LEGUMINOSAE			31/07/1974	P
<i>Acacia paradoxa</i>	Kangaroo Thorn	LEGUMINOSAE			1996	P
<i>Acacia pycnantha</i>	Golden Wattle	LEGUMINOSAE			11/04/1986	P
<i>Acacia provincialis</i>	Swamp Wattle	LEGUMINOSAE			2007	P
<i>Acacia retinodes</i> var. <i>retinodes</i>	Wirilda	LEGUMINOSAE			1994	P
<i>Acacia verniciflua</i>	Varnish Wattle	LEGUMINOSAE		U	28/09/1974	?
<i>Acacia victoriae</i> ssp. <i>victoriae</i>	Elegant Wattle	LEGUMINOSAE		V	8/06/1939	?
<i>Acaena echinata</i>	Sheep's Burr	ROSACEAE			1/01/1974	✓P
<i>Acaena novae-zelandiae</i>	Biddy-biddy	ROSACEAE			13/11/1977	✓P
<i>Acianthus pusillus</i>	Mosquito Orchid	ORCHIDACEAE			1/06/1956	✓
<i>Acrotriche fasciculiflora</i>	Mount Lofty Ground-berry	EPACRIDACEAE		U	11/04/1986	✓
<i>Acrotriche serrulata</i>	Cushion Ground-berry	EPACRIDACEAE			1/09/1908	✓
<i>Adiantum aethiopicum</i>	Common Maiden-hair	ADIANTACEAE			13/04/1936	✓
<i>Adiantum capillus-veneris</i>	Dainty Maiden-hair	ADIANTACEAE	V	V	1/10/1954	✓
<i>Adriana quadripartita</i>	Coast Bitter-bush	EUPHORBIACEAE		U	24/10/1909	?
<i>Alectryon oleifolius</i> ssp. <i>canescens</i>	Bullock Bush	SAPINDACEAE		T	1/01/1928	?
<i>Allocasuarina muelleriana</i> ssp. <i>muelleriana</i>	Common Oak-bush	CASUARINACEAE			24/05/1924	P
<i>Allocasuarina verticillata</i>	Drooping Sheoak	CASUARINACEAE			16/09/1971	P
<i>Amphipogon strictus</i> var. <i>setifer</i>	Spreading Grey-beard Grass	GRAMINEAE			13/01/1973	✓

> Continued on next page

Appendix 1: Flora | Native flora



SPECIES NAME	COMMON NAME	FAMILY NAME	CONSERVATION STATUS		DATE	NEEDS MANAGEMENT
			SA	SML		
<i>Amyema miquelii</i>	Box Mistletoe	LORANTHACEAE			8/03/1969	✓
<i>Amyema pendula</i> ssp. <i>pendula</i>	Drooping Mistletoe	LORANTHACEAE		U	25/04/1925	✓
<i>Anogramma leptophylla</i>	Annual Fern	ADIANTACEAE	R	U	21/09/1935	?
<i>Anthocercis angustifolia</i>	Narrow-leaf Ray-flower	SOLANACEAE	R	R	1/01/1900	?
<i>Aphanes australiana</i>	Australian Piert	ROSACEAE		R	1/09/1911	?
<i>Aphelia pumilio</i>	Dwarf Aphelia	CENTROLEPIDACEAE			8/11/1942	?
<i>Aristida behriana</i>	Brush Wire-grass	GRAMINEAE		U	22/04/1970	✓
<i>Arthropodium fimbriatum</i>	Nodding Vanilla-lily	LILIACEAE			13/01/1973	P
<i>Arthropodium strictum</i>	Common Vanilla-lily	LILIACEAE			6/11/1968	P
<i>Asperula conferta</i>	Common Woodruff	RUBIACEAE			1/10/1993	✓
<i>Asplenium flabellifolium</i>	Necklace Fern	ASPLENIACEAE			17/05/1967	?
<i>Astroloma conostephioides</i>	Flame Heath	EPACRIDACEAE			1/10/1993	✓
<i>Astroloma humifusum</i>	Cranberry Heath	EPACRIDACEAE			1/01/1970	✓
<i>Atriplex semibaccata</i>	Berry Saltbush	CHENOPODIACEAE			14/03/1936	✓P
<i>Atriplex suberecta</i>	Lagoon Saltbush	CHENOPODIACEAE			1/10/1993	✓P
<i>Austrodanthonia auriculata</i>	Lobed Wallaby-grass	GRAMINEAE			1/01/1970	?
<i>Austrodanthonia caespitosa</i>	Common Wallaby-grass	GRAMINEAE			15/11/1985	P
<i>Austrodanthonia carphoides</i>	Short Wallaby-grass	GRAMINEAE			2/10/1941	?
<i>Austrodanthonia duttoniana</i>	Brown-back Wallaby-grass	GRAMINEAE		R	1/01/1900	✓
<i>Austrodanthonia fulva</i>	Leafy Wallaby-grass	GRAMINEAE		U	15/11/1985	✓P
<i>Austrodanthonia pilosa</i>	Velvet Wallaby-grass	GRAMINEAE			12/10/1935	
<i>Austrodanthonia racemosa</i> var. <i>racemosa</i>	Slender Wallaby-grass	GRAMINEAE			7/12/1992	P
<i>Austrodanthonia richardsonii</i>	Straw Wallaby-grass	GRAMINEAE			1/11/1932	?
<i>Austrodanthonia setacea</i>	Small-flower Wallaby-grass	GRAMINEAE			15/11/1985	?
<i>Austrodanthonia tenuior</i>	Short-awn Wallaby-grass	GRAMINEAE	R	R	2/11/1972	✓
<i>Austrostipa blackii</i>	Crested Spear-grass	GRAMINEAE			1/01/1974	?
<i>Austrostipa elegantissima</i>	Feather Spear-grass	GRAMINEAE		U	1/10/1993	?
<i>Austrostipa hemipogon</i>	Half-beard Spear-grass	GRAMINEAE		U	1/10/1993	?
<i>Austrostipa mollis</i>	Soft Spear-grass	GRAMINEAE			1/12/1996	?
<i>Austrostipa nodosa</i>	Tall Spear-grass	GRAMINEAE			1/10/1993	P
<i>Austrostipa pubinodis</i>	Long-shaft Spear-grass	GRAMINEAE		U	1/10/1993	✓
<i>Austrostipa scabra</i> ssp. <i>falcata</i>	Slender Spear-grass	GRAMINEAE			1/01/1974	✓
<i>Austrostipa semibarbata</i>	Fibrous Spear-grass	GRAMINEAE			1/01/1970	P
<i>Banksia marginata</i>	Silver Banksia	PROTEACEAE			1/10/1948	P
<i>Baumea arthropphylla</i>	Swamp Twig-rush	CYPERACEAE		R	3/10/1967	?
<i>Baumea gunnii</i>	Slender Twig-rush	CYPERACEAE	R	R	14/09/1940	?
<i>Baumea juncea</i>	Bare Twig-rush	CYPERACEAE			22/07/1939	?
<i>Baumea tetragona</i>	Square Twig-rush	CYPERACEAE		U	4/11/1885	✓
<i>Blechnum minus</i>	Soft Water-fern	BLECHNACEAE		U	28/07/1935	✓
<i>Blechnum nudum</i>	Fishbone Water-fern	BLECHNACEAE	R	R	28/07/1935	✓
<i>Blechnum watsii</i>	Hard Water-fern	BLECHNACEAE	R	R	3/02/1968	✓
<i>Blennospora drummondii</i>	Dwarf Button-flower	COMPOSITAE			9/10/1886	?

> Continued on next page

Appendix 1: Flora | Native flora



SPECIES NAME	COMMON NAME	FAMILY NAME	CONSERVATION STATUS		DATE	NEEDS MANAGEMENT
			SA	SML		
<i>Boerhavia dominii</i>	Tar-vine	NYCTAGINACEAE			12/03/1933	P
<i>Bossiaea prostrata</i>	Creeping Bossiaea	LEGUMINOSAE			11/11/1977	P
<i>Bothriochloa macra</i>	Red-leg Grass	GRAMINEAE	R	R	16/05/1995	P
<i>Brachyloma ericoides</i> ssp. <i>ericoides</i>	Brush Heath	EPACRIDACEAE			10/07/1892	✓
<i>Brunonia australis</i>	Blue Pincushion	GOODENIACEAE			10/12/1904	✓
<i>Bulbine bulbosa</i>	Bulbine-lily	LILIACEAE			17/09/1972	P
<i>Burchardia umbellata</i>	Milkmaids	LILIACEAE			1/01/1900	?
<i>Bursaria spinosa</i> ssp. <i>spinosa</i>	Sweet Bursaria	PITTOSPORACEAE			1/01/1970	P
<i>Caesia calliantha</i>	Blue Grass-lily	LILIACEAE			8/11/1977	✓
<i>Caladenia latifolia</i>	Pink Caladenia	ORCHIDACEAE		U	1/10/1955	✓
<i>Caladenia leptochila</i>	Narrow-lip Spider-orchid	ORCHIDACEAE			1/10/1955	?
<i>Caladenia prolata</i>	Shy Caladenia	ORCHIDACEAE		R	4/10/1998	✓
<i>Caladenia reticulata</i>	Veined Spider-orchid	ORCHIDACEAE		U	1/10/1978	✓
<i>Caladenia tentaculata</i>	King Spider-orchid	ORCHIDACEAE			1/10/1978	✓
<i>Callistemon rugulosus</i>		MYRTACEAE			1/10/1993	?
<i>Callitris gracilis</i>	Southern Cypress Pine	CUPRESSACEAE		U	1/01/1970	P
<i>Callitris rhomboidea</i>	Native Pine	CUPRESSACEAE			20/04/1920	✓P
<i>Calocephalus citreus</i>	Lemon Beauty-heads	COMPOSITAE		R	30/01/1922	?
<i>Calostemma purpureum</i>	Pink Garland-lily	AMARYLLIDACEAE			12/04/1906	P
<i>Calytrix tetragona</i>	Common Fringe-myrtle	MYRTACEAE			22/03/1924	P
<i>Carex appressa</i>	Tall Sedge	CYPERACEAE			1/01/1900	P
<i>Carex bichenoviana</i>	Notched Sedge	CYPERACEAE		U	3/11/1937	✓
<i>Carex breviculmis</i>	Short-stem Sedge	CYPERACEAE			28/08/1969	P
<i>Carex fascicularis</i>	Tassel Sedge	CYPERACEAE		U	14/12/1925	P
<i>Carex gunniana</i>	Mountain Sedge	CYPERACEAE	R	R	22/10/1972	?
<i>Carex tereticaulis</i>	Rush Sedge	CYPERACEAE			1994	P
<i>Cassinia laevis</i>	Curry Bush	COMPOSITAE			22/03/1971	?
<i>Cassytha pubescens</i>	Downy Dodder-laurel	LAURACEAE			1/11/1920	
<i>Centipeda cunninghamii</i>	Common Sneezeweed	COMPOSITAE			1/01/1904	?
<i>Centrolepis aristata</i>	Pointed Centrolepis	CENTROLEPIDACEAE			10/09/1973	?
<i>Centrolepis fascicularis</i>	Tufted Centrolepis	CENTROLEPIDACEAE		U	7/04/1956	✓
<i>Centrolepis strigosa</i> ssp. <i>strigosa</i>	Hairy Centrolepis	CENTROLEPIDACEAE			10/09/1973	✓
<i>Chamaescilla corymbosa</i> var. <i>corymbosa</i>	Blue Squill	LILIACEAE			8/09/1971	✓
<i>Chamaesyce drummondii</i>		EUPHORBIACEAE			00/00/1996	?
<i>Cheilanthes austrotenuifolia</i>	Rock-fern	ADIANTACEAE			19/07/1972	
<i>Cheilanthes distans</i>	Bristly Cloak-fern	ADIANTACEAE		R	1996	✓
<i>Cheilanthes sieberi</i> ssp. <i>sieberi</i>	Narrow Rock-fern	ADIANTACEAE		R	1/10/1993	✓
<i>Cheiranthra alternifolia</i>	Hand-flower	PITTOSPORACEAE			5/12/1983	?
<i>Chenopodium pumilio</i>	Clammy Goosefoot	CHENOPODIACEAE			1/05/1930	
<i>Chloris truncata</i>	Windmill Grass	GRAMINEAE			5/12/1983	P
<i>Chrysocephalum apiculatum</i>	Common Everlasting	COMPOSITAE			27/10/1977	P
<i>Chrysocephalum semipapposum</i>	Clustered Everlasting	COMPOSITAE		R	24/05/1924	✓
<i>Clematis microphylla</i> var. <i>microphylla</i>	Old Man's Beard	RANUNCULACEAE			1994	P

> Continued on next page

Appendix 1: Flora | Native flora



SPECIES NAME	COMMON NAME	FAMILY NAME	CONSERVATION STATUS		DATE	NEEDS MANAGEMENT
			SA	SML		
<i>Convolvulus erubescens complex</i>		CONVOLVULACEAE			1/10/1993	P
<i>Convolvulus remotus</i>	Grassy Bindweed	CONVOLVULACEAE			15/12/1973	P
<i>Crassula closiana</i>	Stalked Crassula	CRASSULACEAE			1/10/1993	?
<i>Crassula colorata</i> var. <i>acuminata</i>	Dense Crassula	CRASSULACEAE			1/01/1970	
<i>Crassula decumbens</i> var. <i>decumbens</i>	Spreading Crassula	CRASSULACEAE			25/09/1970	
<i>Cullen australasicum</i>	Tall Scurf-pea	LEGUMINOSAE		R	19/11/1929	✓P
<i>Cymbonotus preissianus</i>	Austral Bear's-ear	COMPOSITAE		U	10/08/1935	?
<i>Cynoglossum suaveolens</i>	Sweet Hound's-tongue	BORAGINACEAE		U	1/01/1974	?
<i>Cyperus gymnocaulos</i>	Spiny Flat-sedge	CYPERACEAE			1/04/1904	?
<i>Cyperus vaginatus</i>	Stiff Flat-sedge	CYPERACEAE			1997	P
<i>Daucus glochidiatus</i>	Native Carrot	UMBELLIFERAE			1/11/1903	P
<i>Daviesia brevifolia</i>	Leafless Bitter-pea	LEGUMINOSAE			28/07/1945	?
<i>Daviesia leptophylla</i>	Narrow-leaf Bitter-pea	LEGUMINOSAE			20/10/1964	
<i>Daviesia ulicifolia</i> ssp. <i>incarnata</i>		LEGUMINOSAE			17/09/1950	?
<i>Deyeuxia densa</i>	Heath Bent-grass	GRAMINEAE	R	R	20/12/1942	?
<i>Deyeuxia minor</i>	Small Bent-grass	GRAMINEAE	V	E	29/12/1969	?
<i>Deyeuxia quadriseta</i>	Reed Bent-grass	GRAMINEAE			26/12/1942	?
<i>Dianella longifolia</i> var. <i>grandis</i>	Pale Flax-lily	LILIACEAE	R	V		P
<i>Dianella revoluta</i> var. <i>revoluta</i>	Black-anther Flax-lily	LILIACEAE			8/10/1904	P
<i>Dichelachne crinita</i>	Long-hair Plume-grass	GRAMINEAE			1/12/1996	?
<i>Dichondra repens</i>	Kidney Weed	CONVOLVULACEAE			18/04/2001	P
<i>Dicksonia antarctica</i>	Soft Tree-fern	DICKSONIACEAE	E		28/10/1953	E
<i>Digitaria ciliaris</i>	Summer Grass	GRAMINEAE			14/12/1996	?
<i>Dillwynia hispida</i>	Red Parrot-pea	LEGUMINOSAE			17/11/1917	?
<i>Diuris behrii</i>	Behr's Cowslip Orchid	ORCHIDACEAE	V	V	1/10/1978	?
<i>Diuris orientis</i>	Wallflower Donkey-orchid	ORCHIDACEAE			1/10/1978	?
<i>Diuris pardina</i>	Spotted Donkey-orchid	ORCHIDACEAE			1/10/1978	?
<i>Dodonaea viscosa</i> ssp. <i>spatulata</i>	Sticky Hop-bush	SAPINDACEAE			12/12/1904	P
<i>Drosera auriculata</i>	Tall Sundew	DROSERACEAE			18/09/1887	✓
<i>Drosera binata</i>	Forked Sundew	DROSERACEAE	R	R	26/12/1942	?
<i>Drosera glanduligera</i>	Scarlet Sundew	DROSERACEAE			9/09/1973	?
<i>Drosera macrantha</i> ssp. <i>planchonii</i>	Climbing Sundew	DROSERACEAE			17/09/1950	✓
<i>Drosera peltata</i>	Pale Sundew	DROSERACEAE			9/09/1973	?
<i>Drosera whittakeri</i> ssp. <i>whittakeri</i>		DROSERACEAE			1/01/1970	✓
<i>Einadia nutans</i> ssp. <i>nutans</i>	Climbing Saltbush	CHENOPODIACEAE			24/03/1968	P
<i>Eleocharis gracilis</i>	Slender Spike-rush	CYPERACEAE		U	16/10/1938	?
<i>Elymus scaber</i> var. <i>scaber</i>	Native Wheat-grass	GRAMINEAE			1/12/1996	P
<i>Empodisma minus</i>	Tangled Rope-rush	RESTIONACEAE		U	7/04/1956	?
<i>Enchyleana tormentosa</i>	Ruby Saltbush	CHENOPODIACEAE			1996	✓P
<i>Erneapogon nigricans</i>	Black-head Grass	GRAMINEAE			21/07/1987	P
<i>Epacris impressa</i>	Common Heath	EPACRIDACEAE			7/04/1956	?
<i>Epilobium billardierianum</i> ssp. <i>cinereum</i>	Variable Willow-herb	ONAGRACEAE		U	23/12/1954	?
<i>Epilobium hirtigerum</i>	Hairy Willow-herb	ONAGRACEAE			17/11/1917	?

> Continued on next page

Appendix 1: Flora | Native flora



SPECIES NAME	COMMON NAME	FAMILY NAME	CONSERVATION STATUS		DATE	NEEDS MANAGEMENT
			SA	SML		
<i>Eragrostis brownii</i>	Bentham's Love-grass	GRAMINEAE			18/03/1992	?
<i>Eucalyptus Baxteri</i>	Brown Stringybark	MYRTACEAE			19/05/1947	
<i>Eucalyptus camaldulensis</i> var. <i>camaldulensis</i>	River Red Gum	MYRTACEAE			1/01/1970	P
<i>Eucalyptus cosmophylla</i>	Cup Gum	MYRTACEAE			24/05/1924	
<i>Eucalyptus fasciculosa</i>	Pink Gum	MYRTACEAE	R		17/11/1917	✓
<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	South Australian Blue Gum	MYRTACEAE			25/10/1977	P
<i>Eucalyptus microcarpa</i>	Grey Box	MYRTACEAE		U	20/01/1974	✓P
<i>Eucalyptus obliqua</i>	Messmate Stringybark	MYRTACEAE			1/04/1949	
<i>Eucalyptus porosa</i>	Mallee Box	MYRTACEAE		U	5/12/1982	✓P
<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	Manna Gum	MYRTACEAE	R	R	22/10/1949	✓P
<i>Euchiton collinus</i>	Creeping Cudweed	COMPOSITAE			28/10/1973	?
<i>Euchiton involucreatus</i>	Star Cudweed	COMPOSITAE			9/02/1992	?
<i>Euchiton</i> sp.	Cudweed	COMPOSITAE			1/01/1974	?
<i>Euchiton sphaericus</i>	Annual Cudweed	COMPOSITAE			23/02/1971	?
<i>Euphorbia tannensis</i> ssp. <i>eremophila</i>	Desert Spurge	EUPHORBIACEAE			20/04/1921	?
<i>Eutaxia microphylla</i>	Common Eutaxia	LEGUMINOSAE			1/01/1974	P
<i>Exocarpos cupressiformis</i>	Native Cherry	SANTALACEAE			16/07/1938	✓
<i>Gahnia sieberiana</i>	Red-fruit Cutting-grass	CYPERACEAE		U	4/06/1933	✓
<i>Gahnia trifida</i>	Cutting Grass	CYPERACEAE		U	10/12/1925	?
<i>Galium gaudichaudii</i>	Rough Bedstraw	RUBIACEAE			1/10/1993	?
<i>Galium migrans</i>	Loose Bedstraw	RUBIACEAE			1997	?
<i>Genoplesium rufum</i>	Red Midge-orchid	ORCHIDACEAE			1/01/1959	?
<i>Geranium potentilloides</i> var. <i>potentilloides</i>	Downy Geranium	GERANIACEAE		Q	1999	✓
<i>Geranium retrorsum</i>	Grassland Geranium	GERANIACEAE			1/01/1974	P
<i>Geranium solanderi</i> var. <i>solanderi</i>	Austral Geranium	GERANIACEAE			19/08/1973	P
<i>Gleichenia microphylla</i>	Coral Fern	GLEICHENIACEAE	R	R	1/12/1942	?
<i>Glossodia major</i>	Purple Cockatoo	ORCHIDACEAE			1/10/1978	?
<i>Glyceria australis</i>	Australian Sweet-grass	GRAMINEAE		R	12/11/1932	?
<i>Glycine rubiginosa</i>	Twining Glycine	LEGUMINOSAE				P
<i>Gompholobium ecostatum</i>	Dwarf Wedge-pea	LEGUMINOSAE			1/01/1900	?
<i>Gonocarpus elatus</i>	Hill Raspwort	HALORAGACEAE			1/01/1900	P
<i>Gonocarpus meianus</i>	Broad-leaf Raspwort	HALORAGACEAE			9/09/1973	?
<i>Gonocarpus micranthus</i> ssp. <i>micranthus</i>	Creeping Raspwort	HALORAGACEAE	R	R	26/12/1942	?
<i>Gonocarpus tetragynus</i>	Small-leaf Raspwort	HALORAGACEAE			15/09/1973	P
<i>Goodenia albiflora</i>	White Goodenia	GOODENIACEAE		U	6/11/1992	P
<i>Goodenia amplexans</i>	Clasping Goodenia	GOODENIACEAE		U	16/07/1938	P
<i>Goodenia blackiana</i>	Native Primrose	GOODENIACEAE			7/09/1972	?
<i>Goodenia geniculata</i>	Bent Goodenia	GOODENIACEAE			10/09/1948	?
<i>Goodenia ovata</i>	Hop Goodenia	GOODENIACEAE			1/10/1903	P
<i>Goodenia pinnatifida</i>	Cut-leaf Goodenia	GOODENIACEAE		U	12/11/1905	P
<i>Grevillea lavandulacea</i>	Spider-flower	PROTEACEAE			1/01/1970	✓

> Continued on next page

Appendix 1: Flora | Native flora



SPECIES NAME	COMMON NAME	FAMILY NAME	CONSERVATION STATUS		DATE	NEEDS MANAGEMENT
			SA	SML		
<i>Hakea carinata</i>	Erect Hakea	PROTEACEAE			1/09/1945	P
<i>Hakea rostrata</i>	Beaked Hakea	PROTEACEAE			11/01/1978	✓
<i>Hakea rugosa</i>	Dwarf Hakea	PROTEACEAE			30/09/1990	?
<i>Haloragis brownii</i>	Swamp Raspwort	HALORAGACEAE	R	V	20/12/1942	✓
<i>Hardenbergia violacea</i>	Native Lilac	LEGUMINOSAE			24/10/1909	P
<i>Helichrysum scorpioides</i>	Button Everlasting	COMPOSITAE			20/10/1964	✓
<i>Hibbertia crinita</i>		DILLENIACEAE			5/05/1973	?
<i>Hibbertia exutiacies</i>	Prickly Guinea-flower	DILLENIACEAE			4/10/1959	✓
<i>Hibbertia sericea</i>	Silky Guinea-flower	DILLENIACEAE			1/01/1974	✓
<i>Hibbertia virgata</i>	Twiggy Guinea-flower	DILLENIACEAE			28/07/1945	?
<i>Hibiscus trionum</i> var. <i>trionum</i>	Bladder Ketmia	MALVACEAE			21/03/1968	?
<i>Hyalosperma demissum</i>	Dwarf Sunray	COMPOSITAE			14/10/1957	?
<i>Hybanthus floribundus</i> ssp. <i>floribundus</i>	Shrub Violet	VIOLACEAE			24/05/1924	✓
<i>Hydrocotyle callicarpa</i>	Tiny Pennywort	UMBELLIFERAE			27/09/1973	✓
<i>Hydrocotyle foveolata</i>	Yellow Pennywort	UMBELLIFERAE			28/11/1966	✓
<i>Hydrocotyle hirta</i>	Hairy Pennywort	UMBELLIFERAE		U	26/12/1972	✓
<i>Hydrocotyle laxiflora</i>	Stinking Pennywort	UMBELLIFERAE			22/11/1908	?
<i>Hymenanthera deatata</i>	Tree Violet	VIOLACEAE		R	2001	✓
<i>Hypericum gramineum</i>	Small St John's Wort	GUTTIFERAE			10/12/1904	✓
<i>Hypolepis rugosula</i>	Ruddy Ground-fern	DENNSTAETIDIACEAE	R	V	2/02/1992	✓
<i>Isolepis cernua</i>	Nodding Club-rush	CYPERACEAE			14/10/1952	✓
<i>Isolepis inundata</i>	Swamp Club-rush	CYPERACEAE			4/11/1944	?
<i>Isolepis marginata</i>	Little Club-rush	CYPERACEAE			25/09/1970	✓
<i>Isolepis platycarpa</i>	Flat-fruit Club-rush	CYPERACEAE			16/01/1987	?
<i>Ixodia achillaeoides</i> ssp. <i>alata</i>	Hills Daisy	COMPOSITAE			18/11/1973	✓
<i>Joycea clelandii</i>	Cleland's Wallaby-grass	GRAMINEAE			11/11/1988	?
<i>Juncus bufonius</i>	Toad Rush	JUNCACEAE			11/11/1970	✓
<i>Juncus caespiticius</i>	Grassy Rush	JUNCACEAE			1/01/1944	?
<i>Juncus holoschoenus</i>	Joint-leaf Rush	JUNCACEAE			1/02/1904	?
<i>Juncus pallidus</i>	Pale Rush	JUNCACEAE			14/10/1973	P
<i>Juncus pauciflorus</i>	Loose-flower Rush	JUNCACEAE			9/11/1977	P
<i>Juncus planifolius</i>	Broad-leaf Rush	JUNCACEAE			13/04/1936	P
<i>Juncus sarophorus</i>		JUNCACEAE			9/05/1942	?
<i>Juncus subsecundus</i>	Finger Rush	JUNCACEAE			26/12/1993	P
<i>Juncus usitatus</i>	Common Rush	JUNCACEAE			30/01/1922	?
<i>Kennedia prostrata</i>	Scarlet Runner	LEGUMINOSAE			17/09/1972	P
<i>Lachnagrostis aemula</i>	Blown-grass	GRAMINEAE			13/11/1977	
<i>Lachnagrostis filiformis</i>	Perennial Blown-grass	GRAMINEAE			6/12/1988	✓
<i>Lagenophora huegelii</i>	Coarse Bottle-daisy	COMPOSITAE			29/09/1973	?
<i>Laxmannia orientalis</i>	Dwarf Wire-lily	LILIACEAE			11/10/1943	✓
<i>Leionema hillebrandii</i>	Mount Lofty Phebalium	RUTACEAE	R	R	11/10/1943	✓
<i>Lepidium</i> sp.	Peppergrass	CRUCIFERAE			1/01/1974	?
<i>Lepidosperma carphoides</i>	Black Rapier-sedge	CYPERACEAE			20/06/1955	?

> Continued on next page

Appendix 1: Flora | Native flora



SPECIES NAME	COMMON NAME	FAMILY NAME	CONSERVATION STATUS		DATE	NEEDS MANAGEMENT
			SA	SML		
<i>Lepidosperma curtisiae</i>	Little Sword-sedge	CYPERACEAE			28/11/1958	✓
<i>Lepidosperma semiteres</i>	Wire Rapier-sedge	CYPERACEAE			28/07/1945	✓
<i>Lepidosperma viscidum</i>	Sticky Sword-sedge	CYPERACEAE			28/06/1963	?
<i>Leptorhynchus squamatus</i> ssp. <i>squamatus</i>	Scaly Buttons	COMPOSITAE			1/01/1970	✓
<i>Leptorhynchus tetrachaetus</i>	Little Buttons	COMPOSITAE		X	23/10/1904	X
<i>Leptospermum lanigerum</i>	Silky Tea-tree	MYRTACEAE		U	10/04/1950	✓
<i>Leptospermum myrsinoides</i>	Heath Tea-tree	MYRTACEAE			20/10/1964	?
<i>Leucopogon rufus</i>	Ruddy Beard-heath	EPACRIDACEAE		R	12/10/1991	✓
<i>Leucopogon virgatus</i> var. <i>virgatus</i>	Common Beard-heath	EPACRIDACEAE			23/09/2002	?
<i>Levenhookia dubia</i>	Hairy Stylewort	STYLIDIACEAE			1/01/1970	✓
<i>Levenhookia pusilla</i>	Tiny Stylewort	STYLIDIACEAE			1/01/1974	?
<i>Linum marginale</i>	Native Flax	LINACEAE			10/12/1904	P
<i>Lobelia alata</i>		CAMPANULACEAE			2001	P
<i>Lobelia gibbosa</i>	Tall Lobelia	CAMPANULACEAE			23/12/1973	?
<i>Lobelia rhombifolia</i>	Tufted Lobelia	CAMPANULACEAE		U	16/11/1940	?
<i>Logania recurva</i>	Recurved Logania	LOGANIACEAE		U	1/11/1896	?
<i>Lomandra densiflora</i>	Soft Tussock Mat-rush	LILIACEAE			19/08/1973	✓
<i>Lomandra fibrata</i>	Mount Lofty Mat-rush	LILIACEAE			24/10/1942	✓
<i>Lomandra micrantha</i> ssp. <i>micrantha</i>	Small-flower Mat-rush	LILIACEAE			24/05/1924	✓
<i>Lomandra micrantha</i> ssp. <i>tuberculata</i>	Small-flower Mat-rush	LILIACEAE			8/08/1966	?
<i>Lomandra multiflora</i> ssp. <i>dura</i>	Hard Mat-rush	LILIACEAE			7/09/1972	P
<i>Lomandra nana</i>	Small Mat-rush	LILIACEAE			8/11/1973	✓
<i>Lomandra sororia</i>	Sword Mat-rush	LILIACEAE		U	9/11/1940	✓
<i>Lotus australis</i>	Austral Trefoil	LEGUMINOSAE		U	1/01/1900	P
<i>Luzula flaccida</i>	Pale Wood-rush	JUNCACEAE	V	T	1/01/1900	?
<i>Luzula meridionalis</i>	Common Wood-rush	JUNCACEAE			7/09/1972	?
<i>Lycopodiella lateralis</i>	Slender Clubmoss	LYCOPODIACEAE	R	V	17/03/1956	?
<i>Lysiana exocarpi</i> ssp. <i>exocarpi</i>	Harlequin Mistletoe	LORANTHACEAE				
<i>Lythrum hyssopifolia</i>	Lesser Loosestrife	LYTHRACEAE			26/11/1973	✓
<i>Maireana enchylaenoides</i>	Wingless Fissure-plant	CHENOPODIACEAE		U	3/02/1974	✓
<i>Malva behriana</i>	Australian Hollyhock	MALVACEAE		U		P
<i>Melaleuca decussata</i>	Totem-poles	MYRTACEAE			1/01/1900	?
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Rice-grass	GRAMINEAE			12/12/1904	P
<i>Microseris lanceolata</i>	Yam Daisy	COMPOSITAE			1/01/1974	?
<i>Microtis parviflora</i>	Slender Onion-orchid	ORCHIDACEAE		U	1/10/1955	?
<i>Microtis unifolia</i> complex	Onion-orchid	ORCHIDACEAE			1/10/1978	
<i>Millotia myosotidifolia</i>	Broad-leaf Millotia	COMPOSITAE		U	12/11/1932	?
<i>Millotia tenuifolia</i> var. <i>tenuifolia</i>	Soft Millotia	COMPOSITAE			16/09/1951	?
<i>Myoporum viscosum</i>	Sticky Boobialla	MYOPORACEAE			1/01/1970	P
<i>Neurachne alopecuroides</i>	Fox-tail Mulga-grass	GRAMINEAE			4/10/1972	✓
<i>Nicotiana maritima</i>	Coast Tobacco	SOLANACEAE		R	21/09/1935	?
<i>Olearia ramulosa</i>	Twiggy Daisy-bush	COMPOSITAE			1/01/1970	P
<i>Olearia teretifolia</i>	Cypress Daisy-bush	COMPOSITAE		U	25/10/1977	✓

> Continued on next page

Appendix 1: Flora | Native flora



SPECIES NAME	COMMON NAME	FAMILY NAME	CONSERVATION STATUS		DATE	NEEDS MANAGEMENT
			SA	SML		
<i>Opercularia turpis</i>	Twiggy Stinkweed	RUBIACEAE			1/01/1970	?
<i>Oxalis perennans</i>	Native Sorrel	OXALIDACEAE			25/10/1977	
<i>Panicum effusum</i> var. <i>effusum</i>	Hairy Panic	GRAMINEAE		K	30/01/1922	?
<i>Parietaria debilis</i>	Smooth-nettle	URTICACEAE			1/10/1878	?
<i>Patersonia occidentalis</i>	Long Purple-flag	IRIDACEAE		U	9/04/1936	?
<i>Persicaria decipiens</i>	Slender Knotweed	POLYGONACEAE			27/06/1967	P
<i>Persoonia juniperina</i>	Prickly Geebung	PROTEACEAE		U	16/10/1963	✓
<i>Pheladenia deformis</i>	Bluebeard Orchid	ORCHIDACEAE			26/08/1972	?
<i>Philotheca angustifolia</i> ssp. <i>angustifolia</i>	Narrow-leaf Wax-flower	RUTACEAE	R	R	12/10/1991	✓
<i>Philotheca pungens</i>	Prickly Wax-flower	RUTACEAE		R	12/10/1991	✓
<i>Phragmites australis</i>	Common Reed	GRAMINEAE			1997	P
<i>Phyllangium divergens</i>	Wiry Mitrewort	LOGANIACEAE			20/10/1956	?
<i>Pimelea curviflora</i>	Curved Riceflower	THYMELAEACEAE		R	1997	✓
<i>Pimelea glauca</i>	Smooth Riceflower	THYMELAEACEAE			22/07/1950	✓
<i>Pimelea humilis</i>	Low Riceflower	THYMELAEACEAE			13/10/1967	?
<i>Pimelea linifolia</i> ssp. <i>linifolia</i>	Slender Riceflower	THYMELAEACEAE			11/10/1943	?
<i>Pimelea phylloides</i>	Heath Riceflower	THYMELAEACEAE			20/10/1965	?
<i>Pimelea stricta</i>	Erect Riceflower	THYMELAEACEAE			11/08/1934	?
<i>Pittosporum angustifolium</i>	Native Apricot	PITTOSPORACEAE		R	16/06/1923	✓P
<i>Plantago gaudichaudii</i>	Narrow-leaf Plantain	PLANTAGINACEAE		U	1/09/1993	?
<i>Plantago hispida</i>	Hairy Plantain	PLANTAGINACEAE			1/10/1993	?
<i>Plantago varia</i>	Variable Plantain	PLANTAGINACEAE			1/01/1970	✓P
<i>Platylobium obtusangulum</i>	Holly Flat-pea	LEGUMINOSAE			27/09/1977	?
<i>Pleurosorus rutifolius</i>	Blanket Fern	ASPLENIACEAE		U	25/09/1958	✓
<i>Poa clelandii</i>	Matted Tussock-grass	GRAMINEAE			22/11/1953	?
<i>Poa crassicaudex</i>	Thick-stem Tussock-grass	GRAMINEAE			2/10/1972	?
<i>Poa labillardieri</i> var. <i>labillardieri</i>	Common Tussock-grass	GRAMINEAE			30/11/1958	P
<i>Poa poiformis</i> var. <i>poiformis</i>	Coast Tussock-grass	GRAMINEAE			20/10/1906	?
<i>Poa tenera</i>	Slender Tussock-grass	GRAMINEAE		U	14/10/1973	?
<i>Poa umbricola</i>	Shade Tussock-grass	GRAMINEAE	R	R	1/01/1900	?
<i>Podolepis tepperi</i>	Delicate Copper-wire Daisy	COMPOSITAE		R	1/01/1900	?
<i>Poranthera microphylla</i>	Small Poranthera	EUPHORBIACEAE			1/01/1974	?
<i>Prasophyllum fitzgeraldii</i>	Fitzgerald's Leek-orchid	ORCHIDACEAE		R	1/01/1974	?
<i>Prasophyllum occidentale</i>	Plains Leek-orchid	ORCHIDACEAE			1/10/1955	?
<i>Prasophyllum odoratum</i>	Scented Leek-orchid	ORCHIDACEAE			1/10/1955	?
<i>Prasophyllum pallidum</i>	Pale Leek-orchid	ORCHIDACEAE	V	V	1/10/1978	?
<i>Prasophyllum pruinosum</i>	Plum Leek-orchid	ORCHIDACEAE	V	V	1/10/1978	?
<i>Prostanthera behriana</i>	Downy Mintbush	LABIATAE		U	17/11/1917	✓
<i>Pseudognaphalium luteoalbum</i>	Jersey Cudweed	COMPOSITAE			19/12/1992	
<i>Pteridium esculentum</i>	Bracken Fern	DENNSTAEDTIACEAE			1994	
<i>Pterostylis nana</i>	Dwarf Greenhood	ORCHIDACEAE			1/10/1955	?
<i>Pterostylis pedunculata</i>	Maroon-hood	ORCHIDACEAE			2000	✓
<i>Pterostylis robusta</i>	Large Shell-orchid	ORCHIDACEAE			1/10/1993	?
<i>Pterostylis sanguinea</i>	Blood Greenhood	ORCHIDACEAE			1/10/1978	?

> Continued on next page

Appendix 1: Flora | Native flora



SPECIES NAME	COMMON NAME	FAMILY NAME	CONSERVATION STATUS		DATE	NEEDS MANAGEMENT
			SA	SML		
<i>Ptilotus erubescens</i>	Hairy-tails	AMARANTHACEAE	R	R	15/12/1973	?
<i>Ptilotus spathulatus</i> f. <i>spathulatus</i>	Pussy-tails	AMARANTHACEAE		R	1996	✓P
<i>Pultenaea acerosa</i>	Bristly Bush-pea	LEGUMINOSAE		U	1/01/1944	?
<i>Pultenaea daphnoides</i>	Large-leaf Bush Pea	LEGUMINOSAE			23/09/2002	P
<i>Pultenaea involucrata</i>	Mount Lofty Bush-pea	LEGUMINOSAE		U	4/01/1962	?
<i>Pultenaea largiflorens</i>	Twiggy Bush-pea	LEGUMINOSAE			11/10/1943	P
<i>Pultenaea laxiflora</i>	Loose-flower Bush-pea	LEGUMINOSAE			13/11/1977	?
<i>Pultenaea tenuifolia</i>	Narrow-leaf Bush-pea	LEGUMINOSAE		R	1/07/1932	?
<i>Ranunculus lappaceus</i>	Native Buttercup	RANUNCULACEAE			13/08/1904	P
<i>Ranunculus sessiliflorus</i> var. <i>sessiliflorus</i>	Annual Buttercup	RANUNCULACEAE			2/11/1968	✓
<i>Rhodanthe laevis</i>	Smooth Daisy	COMPOSITAE		U	10/09/1951	?
<i>Rhodanthe pygmaea</i>	Pigmy Daisy	COMPOSITAE		U	8/10/1904	?
<i>Rubus parvifolius</i>	Native Raspberry	ROSACEAE		U	1996	P✓
<i>Rumex brownii</i>	Slender Dock	POLYGONACEAE			9/09/1973	P✓
<i>Samolus repens</i>	Creeping Brookweed	PRIMULACEAE		U	18/09/1887	P
<i>Scaevola albida</i>	Pale Fanflower	GOODENIACEAE			17/09/1950	P
<i>Schizaea fistulosa</i>	Narrow Comb-fern	SCHIZAEACEAE	V	E	24/04/1944	?
<i>Schoenus apogon</i>	Common Bog-rush	CYPERACEAE			7/09/1972	✓
<i>Schoenus breviculmis</i>	Matted Bog-rush	CYPERACEAE			1/01/1970	?
<i>Schoenus fluitans</i>	Floating Bog-rush	CYPERACEAE		X	28/07/1935	
<i>Schoenus maschalinus</i>	Leafy Bog-rush	CYPERACEAE		U	16/10/1938	?
<i>Sebaea ovata</i>	Yellow Sebaea	GENTIANACEAE			1/11/1905	?
<i>Senecio hypoleucus</i>	Pale Groundsel	COMPOSITAE		U	27/10/1973	P
<i>Senecio quadridentatus</i>	Cotton Groundsel	COMPOSITAE			27/10/1973	P
<i>Setaria jubiflora</i>	Warrego Summer-grass	GRAMINEAE		K		✓
<i>Sigesbeckia australiensis</i>	Australian Sigesbeckia	COMPOSITAE			1/02/1904	?
<i>Sigesbeckia orientalis</i> ssp. <i>orientalis</i>	Oriental Sigesbeckia	COMPOSITAE		R	1994	P
<i>Solanum laciniatum</i>	Cut-leaf Kangaroo-apple	SOLANACEAE		R	1/01/1900	✓
<i>Sonchus hydrophilus</i>	Native Sow-thistle	COMPOSITAE			25/04/1943	?
<i>Sphaerolobium minus</i>	Leafless Globe-pea	LEGUMINOSAE	R	R	1/01/1900	?
<i>Sprengelia incarnata</i>	Pink Swamp-heath	EPACRIDACEAE	R	R	17/03/1956	?
<i>Spyridium parvifolium</i>	Dusty Miller	RHAMNACEAE			11/04/1986	?
<i>Stackhousia monogyna</i>	Creamy Candles	STACKHOUSIACEAE			1996	P✓
<i>Stuartina muelleri</i>	Spoon Cudweed	COMPOSITAE			1/10/1878	?
<i>Swainsona lessertifolia</i>	Coast Swainson-pea	LEGUMINOSAE		R	4/09/1971	?
<i>Tetradlea pilosa</i> ssp. <i>pilosa</i>	Hairy Pink-bells	TREMANDRACEAE			16/08/1938	?
<i>Thelymitra antennifera</i>	Lemon Sun-orchid	ORCHIDACEAE			23/09/1972	?
<i>Thelymitra flexuosa</i>	Twisted Sun-orchid	ORCHIDACEAE	R	R	1/01/1953	?
<i>Thelymitra luteociliium</i>	Yellow-tuft Sun Orchid	ORCHIDACEAE			9/09/1973	?
<i>Thelymitra nuda</i>	Scented Sun-orchid	ORCHIDACEAE			1/10/1978	?
<i>Thelymitra pauciflora</i>	Slender Sun-orchid	ORCHIDACEAE			1/10/1978	?
<i>Thelymitra rubra</i>	Salmon Sun-orchid	ORCHIDACEAE			1/10/1978	✓
<i>Thelymitra truncata</i>	Hybrid Sun-orchid	ORCHIDACEAE			1/01/1974	?
<i>Themeda triandra</i>	Kangaroo Grass	GRAMINEAE			4/07/1905	

> Continued on next page

Appendix 1: Flora | Native flora



SPECIES NAME	COMMON NAME	FAMILY NAME	CONSERVATION STATUS		DATE	NEEDS MANAGEMENT
			SA	SML		
<i>Thysanotus junceifolius</i>	Rush Fringe-lily	LILIACEAE			6/12/1964	?
<i>Thysanotus patersonii</i>	Twining Fringe-lily	LILIACEAE			6/10/1973	✓
<i>Todea barbara</i>	King Fern	OSMUNDACEAE	E	E	11/10/1943	?
<i>Tricoryne elatior</i>	Yellow Rush-lily	LILIACEAE			8/03/1969	?
<i>Triptilodiscus pygmaeus</i>	Small Yellow-heads	COMPOSITAE		U	1/01/1900	?
<i>Typha domingensis</i>	Narrow-leaf Bulrush	TYPHACEAE			2/08/1992	
<i>Velleia paradoxa</i>	Spur Velleia	GOODENIACEAE		U	20/09/1973	?
<i>Viola sieberiana</i>	Tiny Violet	VIOLACEAE			17/11/1917	?
<i>Vittadinia blackii</i>	Narrow-leaf New Holland Daisy	COMPOSITAE		R	24/05/1924	P✓
<i>Vittadinia cuneata</i> var. <i>cuneata</i> f. <i>cuneata</i>	Fuzzy New Holland Daisy	COMPOSITAE			1/01/1970	P✓
<i>Vittadinia gracilis</i>	Woolly New Holland Daisy	COMPOSITAE			24/05/1930	P✓
<i>Wahlenbergia gracilentia</i>	Annual Bluebell	CAMPANULACEAE			2007	✓
<i>Wahlenbergia luteola</i>	Yellow-wash Bluebell	CAMPANULACEAE			1996	✓
<i>Wahlenbergia stricta</i> ssp. <i>stricta</i>	Tall Bluebell	CAMPANULACEAE			1/01/1970	✓
<i>Wurmbea dioica</i> ssp. <i>dioica</i>	Early Nancy	LILIACEAE			20/08/1971	✓
<i>Xanthorrhoea quadrangulata</i>	Rock Grass-tree	LILIACEAE			31/12/1957	✓
<i>Xanthorrhoea semiplana</i> ssp. <i>semiplana</i>	Yacca	LILIACEAE			1/01/1970	?

KEY

SA = South Australia, SL = Southern Lofty Botanical Region

SL Conservation Codes - Listed in order of decreasing conservation significance:

X = Extinct/Presumed extinct: not located despite thorough searching of all known and likely habitats; known to have been eliminated by the loss of localised population(s); or not recorded for more than 50 years from an area where substantial habitat modification has occurred, **E** = Endangered: rare and in danger of becoming extinct in the wild, **T** = Threatened: likely to be either Endangered or Vulnerable but insufficient data available for more precise assessment, **V** = Vulnerable: rare and at risk from potential threats or long term threats that could cause the species to become endangered in the future,

K = Uncertain: likely to be either Threatened or Rare but insufficient data available for a more precise assessment, **R** = Rare: has a low overall frequency of occurrence (may be locally

common with a very restricted distribution or may be scattered sparsely over a wider area). Not currently exposed to significant or widespread threats, but warrants monitoring and protective measures to prevent reduction of population sizes, **U** = Uncommon: less common species of interest but not rare enough to warrant special protective measures, **Q** = Not yet assessed but flagged as being of possible significance

SA Conservation Codes

E = Endangered (Schedule 7, Part 2) *Note that there is no category specifically for species that are presumed to be extinct. Instead these are included in the Endangered category, **V** = Vulnerable (Schedule 8, Part 2), **R** = Rare (Schedule 9, Part 2)

Data Source: South Australian Department for Environment and Heritage database.

Appendix 1: Flora | Introduced Flora (weeds)



SPECIES NAME	COMMON NAME	FAMILY NAME	DATE
<i>Acacia decurrens</i>	Early Black Wattle	LEGUMINOSAE	5/08/1972
<i>Acacia longifolia</i> ssp. <i>longifolia</i>	Sallow Wattle	LEGUMINOSAE	21/07/1973
<i>Acacia saligna</i>	Golden Wreath Wattle	LEGUMINOSAE	1/01/1970
<i>Acer negundo</i>	Box Elder	ACERACEAE	19/02/1988
<i>Adonis microcarpa</i>	Pheasant's Eye	RANUNCULACEAE	5/10/1945
<i>Agave americana</i>	Century Plant	AGAVACEAE	1994
<i>Ageratina adenophora</i>	Crofton Weed	COMPOSITAE	23/10/1987
<i>Aira cupaniana</i>	Small Hair-grass	GRAMINEAE	2/11/1952
<i>Allium ampeloprasum</i>	Wild Leek	LILIACEAE	1/12/1950
<i>Allium triquetrum</i>	Three-cornered Garlic	LILIACEAE	20/10/1977
<i>Amaranthus albus</i>	Stiff Tumbleweed	AMARANTHACEAE	26/03/1939
<i>Amaranthus muricatus</i>	Rough-fruit Amaranth	AMARANTHACEAE	31/05/1981
<i>Amaranthus retroflexus</i>	Red-root Amaranth	AMARANTHACEAE	30/04/1955
<i>Amaranthus viridis</i>	Green Amaranth	AMARANTHACEAE	11/01/1958
<i>Amaryllis belladonna</i>	Belladonna Lily	AMARYLLIDACEAE	3/02/1974
<i>Anagallis arvensis</i>	Pimpernel	PRIMULACEAE	1/01/1987
<i>Anagallis</i> sp.		PRIMULACEAE	11/04/1986
<i>Anethum graveolens</i>		UMBELLIFERAE	28/01/1996
<i>Apium graveolens</i>	Celery	UMBELLIFERAE	30/11/1909
<i>Arctotheca calendula</i>	Cape Weed	COMPOSITAE	25/10/1977
<i>Arundo donax</i>	Giant Reed	GRAMINEAE	1/01/1997
<i>Asparagus asparagoides</i>	Bridal Creeper	LILIACEAE	1/01/1974
<i>Asphodelus fistulosus</i>	Onion Weed	LILIACEAE	3/08/1973
<i>Aster subulatus</i>	Aster-weed	COMPOSITAE	23/04/1943
<i>Avena barbata</i>	Bearded Oat	GRAMINEAE	1/01/1970
<i>Avena fatua</i>	Wild Oat	GRAMINEAE	2/10/1972
<i>Babiana angustifolia</i>	Baboon-flower	IRIDACEAE	24/09/1951
<i>Barbarea verna</i>	Early Wintercress	CRUCIFERAE	15/11/1943
<i>Brachypodium distachyon</i>	False Brome	GRAMINEAE	18/10/1905
<i>Briza maxima</i>	Large Quaking-grass	GRAMINEAE	29/11/1942
<i>Briza minor</i>	Lesser Quaking-grass	GRAMINEAE	29/11/1942
<i>Bromus catharticus</i>	Prairie Grass	GRAMINEAE	10/04/1950
<i>Bromus diandrus</i>	Great Brome	GRAMINEAE	3/10/1973
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	Soft Brome	GRAMINEAE	1/11/1903
<i>Bromus madritensis</i>	Compact Brome	GRAMINEAE	2/10/1972
<i>Buddleja davidii</i>	Butterfly Bush	BUDDLEJACEAE	14/12/1996
<i>Calendula arvensis</i>	Field Marigold	COMPOSITAE	25/08/1946
<i>Capsella bursa-pastoris</i>	Shepherd's Purse	CRUCIFERAE	17/10/1943
<i>Cardamine flexuosa</i>	Wood Bitter-cress	CRUCIFERAE	17/09/2001
<i>Carduus pycnocephalus</i>	Shore Thistle	COMPOSITAE	30/11/1983
<i>Carthamus lanatus</i>	Saffron Thistle	COMPOSITAE	4/02/1922
<i>Catapodium rigidum</i>	Rigid Fescue	GRAMINEAE	1/01/1974
<i>Centaurea calcitrapa</i>	Star Thistle	COMPOSITAE	27/12/1907
<i>Centaurea melitensis</i>	Malta Thistle	COMPOSITAE	1/08/1940
<i>Centaurium erythraea</i>	Common Centaury	GENTIANACEAE	1/01/1974
<i>Centaurium</i> sp.	Centaury	GENTIANACEAE	18/04/2001

> Continued on next page

Appendix 1: Flora | Introduced Flora (weeds)



SPECIES NAME	COMMON NAME	FAMILY NAME	DATE
<i>Centaurium tenuiflorum</i>	Branched Centaury	GENTIANACEAE	25/11/1973
<i>Centranthus ruber ssp. ruber</i>	Red Valerian	VALERIANACEAE	1/01/1974
<i>Cerastium glomeratum</i>		CARYOPHYLLACEAE	
<i>Ceratonia siliqua</i>	Carob Tree	LEGUMINOSAE	1994
<i>Chamaecytisus palmensis</i>	Tree Lucerne	LEGUMINOSAE	30/08/1972
<i>Chasmanthe floribunda var. floribunda</i>	African Corn-flag	IRIDACEAE	7/08/1972
<i>Chenopodium album</i>	Fat Hen	CHENOPODIACEAE	24/02/1952
<i>Chrysanthemoides monilifera ssp. monilifera</i>	Boneseed	COMPOSITAE	22/08/1971
<i>Cicendia quadrangularis</i>	Square Cicendia	GENTIANACEAE	30/09/1912
<i>Cichorium intybus</i>	Chicory	COMPOSITAE	26/01/1956
<i>Ciclospermum leptophyllum</i>	Narrow-leaf Celery	UMBELLIFERAE	28/12/1985
<i>Cirsium vulgare</i>	Spear Thistle	COMPOSITAE	11/04/1986
<i>Clematis flammula</i>		RANUNCULACEAE	9/04/1991
<i>Conium maculatum</i>	Hemlock	UMBELLIFERAE	9/11/1993
<i>Convolvulus arvensis</i>	Field Bindweed	CONVOLVULACEAE	9/09/1972
<i>Conyza albida</i>	Tall Fleabane	COMPOSITAE	19/05/1973
<i>Conyza bonariensis</i>	Flax-leaf Fleabane	COMPOSITAE	25/04/1950
<i>Coronaria sp.</i>		LEGUMINOSAE	2002
<i>Cotoneaster pannosus</i>	Cotoneaster	ROSACEAE	14/01/1987
<i>Cotoneaster sp.</i>	Cotoneaster	ROSACEAE	1/01/1987
<i>Cotula coronopifolia</i>	Water Buttons	COMPOSITAE	1/11/1903
<i>Crataegus azarolus</i>	Azarola Thorn	ROSACEAE	18/04/2001
<i>Crataegus monogyna</i>	Hawthorn	ROSACEAE	1/10/1908
<i>Crepis capillaris</i>	Smooth Hawksbeard	COMPOSITAE	5/12/1983
<i>Cucumis myriocarpus</i>	Paddy Melon	CUCURBITACEAE	1/01/1900
<i>Cydonia oblonga</i>	Quince	ROSACEAE	8/10/1973
<i>Cynara cardunculus ssp. flavescens</i>	Artichoke Thistle	COMPOSITAE	1/01/1987
<i>Cynodon dactylon var. dactylon</i>	Couch	GRAMINEAE	1/01/1997
<i>Cynosurus echinatus</i>	Rough Dog's-tail Grass	GRAMINEAE	4/11/1973
<i>Cyperus congestus</i>	Dense Flat-sedge	CYPERACEAE	22/03/1924
<i>Cyperus eragrostis</i>	Drain Flat-sedge	CYPERACEAE	19/12/1992
<i>Cyperus involucratus</i>		CYPERACEAE	1996
<i>Dactylis glomerata</i>	Cocksfoot	GRAMINEAE	20/10/1924
<i>Datura stramonium</i>	Common Thorn-apple	SOLANACEAE	14/03/1975
<i>Delairea odorata</i>	Cape Ivy	COMPOSITAE	00/00/1994
<i>Digitaria ischaemum</i>	Smooth Summer-grass	GRAMINEAE	26/04/1908
<i>Digitaria sanguinalis</i>	Crab Grass	GRAMINEAE	14/04/1969
<i>Digitaria violascens</i>		GRAMINEAE	13/03/1995
<i>Dipogon lignosus</i>	Lavatory Creeper	LEGUMINOSAE	1/12/1904
<i>Dittrichia graveolens</i>	Stinkweed	COMPOSITAE	15/03/1952
<i>Echinochloa colona</i>	Awnless Barnyard Grass	GRAMINEAE	4/03/1946
<i>Echinochloa crus-galli</i>	Common Barnyard Grass	GRAMINEAE	1/01/1987
<i>Echium plantagineum</i>	Salvation Jane	BORAGINACEAE	8/04/1983
<i>Ehrharta erecta</i>	Panic Veldt Grass	GRAMINEAE	23/10/1904
<i>Ehrharta longiflora</i>	Annual Veldt Grass	GRAMINEAE	19/12/1992
<i>Epilobium ciliatum</i>	Glandular Willow-herb	ONAGRACEAE	11/02/1993

> Continued on next page

Appendix 1: Flora | Introduced Flora (weeds)



SPECIES NAME	COMMON NAME	FAMILY NAME	DATE
<i>Eragrostis cilianensis</i>	Stink Grass	GRAMINEAE	1994
<i>Erica arborea</i>	Tree Heath	ERICACEAE	1/10/1993
<i>Erica sp.</i>	Heath	ERICACEAE	2/09/1906
<i>Erodium botrys</i>	Long Heron's-bill	GERANIACEAE	9/09/1934
<i>Erodium brachycarpum</i>	Short-fruit Heron's-bill	GERANIACEAE	17/09/1944
<i>Erodium cicutarium</i>	Cut-leaf Heron's-bill	GERANIACEAE	7/09/1972
<i>Erodium moschatum</i>	Musky Heron's-bill	GERANIACEAE	31/08/1942
<i>Euphorbia dendroides</i>	Tree Spurge	EUPHORBIACEAE	1/01/1900
<i>Euphorbia exigua</i>	Dwarf Spurge	EUPHORBIACEAE	17/06/1950
<i>Euphorbia peplus</i>	Petty Spurge	EUPHORBIACEAE	26/02/1982
<i>Euphorbia segetalis</i>	Short-stem Carnation Weed	EUPHORBIACEAE	2/11/1972
<i>Euphorbia terracina</i>	False Caper	EUPHORBIACEAE	30/01/1949
<i>Eustachys distichophylla</i>	Evergreen Chloris	GRAMINEAE	1/02/1927
<i>Fallopia convolvulus</i>	Black Bindweed	POLYGONACEAE	29/04/2004
<i>Ferula communis ssp. communis</i>	Common Giant Fennel	UMBELLIFERAE	1/01/1987
<i>Festuca arundinacea</i>	Tall Meadow Fescue	GRAMINEAE	23/10/1987
<i>Ficus carica</i>	Edible Fig	MORACEAE	25/03/1950
<i>Foeniculum vulgare</i>	Fennel	UMBELLIFERAE	1/01/1970
<i>Fraxinus angustifolia</i>	Desert Ash	OLEACEAE	19/09/2000
<i>Freesia cultivar</i>	Freesia	IRIDACEAE	18/09/1966
<i>Fumaria bastardii</i>	Bastard Fumitory	FUMARIACEAE	28/07/1973
<i>Fumaria capreolata</i>	White-flower Fumitory	FUMARIACEAE	18/09/1928
<i>Fumaria muralis ssp. muralis</i>	Wall Fumitory	FUMARIACEAE	28/12/1970
<i>Galenia pubescens var. pubescens</i>	Coastal Galenia	AIZOACEAE	30/04/1908
<i>Galinsoga parviflora</i>	Yellow Weed	COMPOSITAE	1/01/1944
<i>Galium aparine</i>	Cleavers	RUBIACEAE	26/11/1942
<i>Gastrium phleoides</i>	Nit-grass	GRAMINEAE	17/11/1992
<i>Gazania rigens</i>	Gazania	COMPOSITAE	1/01/1974
<i>Gazania sp.</i>	Gazania	COMPOSITAE	1/12/1952
<i>Genista linifolia</i>	Flax-leaf Broom	LEGUMINOSAE	14/06/1975
<i>Genista monspessulana</i>	Montpellier Broom	LEGUMINOSAE	3/10/1948
<i>Gladiolus carneus</i>	Broad-leaf Painted Lady	IRIDACEAE	9/09/1972
<i>Gladiolus tristis</i>	Evening-flower Gladiolus	IRIDACEAE	1/01/1987
<i>Gomphocarpus cancellatus</i>	Broad-leaf Cotton-bush	ASCLEPIADACEAE	1/01/1987
<i>Grevillea rosmarinifolia ssp. rosmarinifolia</i>	Rosemary Grevillea	PROTEACEAE	11/07/1967
<i>Hainardia cylindrica</i>	Common Barb-grass	GRAMINEAE	10/12/1904
<i>Hakea laurina</i>	Pincushion Hakea	PROTEACEAE	13/06/1983
<i>Hedera helix ssp. helix</i>	Ivy	ARALIACEAE	1994
<i>Hedynois rhagadioloides</i>	Cretan Weed	COMPOSITAE	23/10/1904
<i>Heliotropium amplexicaule</i>	Blue Heliotrope	BORAGINACEAE	1/01/1974
<i>Heliotropium europaeum</i>	Common Heliotrope	BORAGINACEAE	1/01/1987
<i>Helminthotheca echioides</i>	Ox-tongue	COMPOSITAE	1/01/1973
<i>Hesperantha falcata</i>		IRIDACEAE	5/10/1908
<i>Holcus lanatus</i>	Yorkshire Fog	GRAMINEAE	14/09/1906
<i>Hordeum glaucum</i>	Blue Barley-grass	GRAMINEAE	10/10/1910
<i>Hordeum leporinum</i>	Wall Barley-grass	GRAMINEAE	2/10/1972

> Continued on next page

Appendix 1: Flora | Introduced Flora (weeds)



SPECIES NAME	COMMON NAME	FAMILY NAME	DATE
<i>Hordeum marinum</i>	Sea Barley-grass	GRAMINEAE	1/01/1974
<i>Hordeum vulgare</i>	Barley	GRAMINEAE	17/05/1949
<i>Humulus lupulus</i>	Hop	CANNABACEAE	13/03/1995
<i>Hypericum perforatum</i>	St John's Wort	GUTTIFERAE	13/01/1973
<i>Hypochaeris glabra</i>	Smooth Cat's Ear	COMPOSITAE	12/11/1905
<i>Hypochaeris radicata</i>	Rough Cat's Ear	COMPOSITAE	12/04/1906
<i>Ipomoea indica</i>	Purple Morning-glory	CONVOLVULACEAE	1994
<i>Iris germanica</i>	Flag Iris	IRIDACEAE	1/01/1987
<i>Ixia flexuosa</i>		IRIDACEAE	1/01/1974
<i>Ixia polystachya</i>	Variable Ixia	IRIDACEAE	3/11/1973
<i>Juncus articulatus</i>	Jointed Rush	JUNCACEAE	10/06/1993
<i>Juncus capitatus</i>	Dwarf Rush	JUNCACEAE	20/10/1905
<i>Lactuca serriola</i>	Prickly Lettuce	COMPOSITAE	1/01/1997
<i>Lagurus ovatus</i>	Hare's Tail Grass	GRAMINEAE	1/01/1907
<i>Lathyrus latifolius</i>	Perennial Pea	LEGUMINOSAE	1994
<i>Lathyrus sphaericus</i>	Slender Wild-pea	LEGUMINOSAE	28/10/2000
<i>Lathyrus tingitanus</i>	Tangier Pea	LEGUMINOSAE	13/11/1943
<i>Lavandula stoechas</i>	Topped Lavender	LABIATAE	1/01/1974
<i>Lepidium africanum</i>	Common Peppergrass	CRUCIFERAE	14/01/1971
<i>Lepidium draba</i>	Hoary Cress	CRUCIFERAE	29/10/1925
<i>Leucanthemum vulgare</i>	Ox-eye Daisy	COMPOSITAE	3/09/1995
<i>Leucojum aestivum</i>	Snowflake	AMARYLLIDACEAE	21/07/1973
<i>Limonium complanatum</i>	Sea-lavender	LIMONIACEAE	4/01/1998
<i>Linum trigynum</i>	French Flax	LINACEAE	6/12/1988
<i>Lolium lolaceum</i>	Stiff Ryegrass	GRAMINEAE	1/09/1906
<i>Lolium perenne</i>	Perennial Ryegrass	GRAMINEAE	10/12/1904
<i>Lolium rigidum</i>	Wimmera Ryegrass	GRAMINEAE	1/10/1913
<i>Lycium ferocissimum</i>	African Boxthorn	SOLANACEAE	14/03/1936
<i>Malus pumila</i>	Apple	ROSACEAE	1/01/1974
<i>Medicago arabica</i>	Spotted Medic	LEGUMINOSAE	26/10/1908
<i>Medicago littoralis</i>	Strand Medic	LEGUMINOSAE	16/10/1921
<i>Medicago lupulina</i>	Black Medic	LEGUMINOSAE	23/11/1947
<i>Medicago minima var. minima</i>	Little Medic	LEGUMINOSAE	1/09/1913
<i>Medicago orbicularis</i>	Button Medic	LEGUMINOSAE	16/10/1921
<i>Medicago polymorpha var. polymorpha</i>	Burr-medic	LEGUMINOSAE	1/01/1974
<i>Medicago scutellata</i>	Snail Medic	LEGUMINOSAE	28/10/1945
<i>Medicago sp.</i>	Medic	LEGUMINOSAE	1/01/1974
<i>Medicago truncatula</i>	Barrel Medic	LEGUMINOSAE	28/10/1945
<i>Melaleuca hypericifolia</i>		MYRTACEAE	1994
<i>Melia azedarach var. australasica</i>	White Cedar	MELIACEAE	1994
<i>Melianthus comosus</i>	Tufted Honey-flower	MELIANTHACEAE	18/10/1909
<i>Melianthus major</i>	Cape Honey-flower	MELIANTHACEAE	1/10/1909
<i>Melilotus albus</i>	Bokhara Clover	LEGUMINOSAE	1/03/1910
<i>Mirabilis jalapa</i>	Marvel-of-peru	NYCTAGINACEAE	4/04/1987
<i>Modiola caroliniana</i>	Red-flowered Mallow	MALVACEAE	13/11/1977
<i>Moraea bellendenii</i>		IRIDACEAE	23/09/1987

> Continued on next page

Appendix 1: Flora | Introduced Flora (weeds)



SPECIES NAME	COMMON NAME	FAMILY NAME	DATE
<i>Moraea flaccida</i>	One-leaf Cape Tulip	IRIDACEAE	1/01/1974
<i>Moraea miniata</i>	Two-leaf Cape Tulip	IRIDACEAE	1/01/1974
<i>Moraea setifolia</i>	Thread Iris	IRIDACEAE	5/09/1982
<i>Muraltia heisteria</i>	African Furze	POLYGALACEAE	1994
<i>Narcissus tazetta</i>	Polyanthus Narcissus	AMARYLLIDACEAE	16/06/1973
<i>Nicotiana glauca</i>	Tree Tobacco	SOLANACEAE	7/10/1977
<i>Nothoscordum borbonicum</i>		LILIACEAE	24/11/1992
<i>Oenothera acaulis</i>		ONAGRACEAE	1/10/1922
<i>Oenothera stricta</i> ssp. <i>stricta</i>	Common Evening Primrose	ONAGRACEAE	2/03/1931
<i>Olea europaea</i> ssp. <i>europaea</i>	Olive	OLEACEAE	2/11/1972
<i>Onopordum acaulon</i>	Horse Thistle	COMPOSITAE	2/11/1930
<i>Ornithogalum arabicum</i>	Star Of Africa	LILIACEAE	1/01/1974
<i>Ornithogalum thyrsooides</i>	Chincherinchee	LILIACEAE	11/10/1960
<i>Oxalis brasiliensis</i>	Brazil Wood-sorrel	OXALIDACEAE	1/10/1921
<i>Oxalis flava</i>	Finger-leaf Oxalis	OXALIDACEAE	12/05/1952
<i>Oxalis hirta</i>	Hairy Wood-sorrel	OXALIDACEAE	1/01/1974
<i>Oxalis pes-caprae</i>	Soursob	OXALIDACEAE	12/08/1967
<i>Oxalis purpurea</i>	One-o'clock	OXALIDACEAE	15/07/1972
<i>Panicum capillare</i> var. <i>brevifolium</i>	Witch-grass	GRAMINEAE	24/03/1968
<i>Panicum hillmanii</i>	Witch-grass	GRAMINEAE	5/01/1992
<i>Panicum miliaceum</i> ssp. <i>miliaceum</i>	Broom Millet	GRAMINEAE	23/01/1910
<i>Papaver dubium</i>	Long-headed Poppy	PAPAVERACEAE	18/10/1950
<i>Papaver hybridum</i>	Rough Poppy	PAPAVERACEAE	1/11/1920
<i>Papaver rhoeas</i>	Field Poppy	PAPAVERACEAE	14/12/1916
<i>Papaver somniferum</i>	Small-flower Opium Poppy	PAPAVERACEAE	25/11/1976
<i>Parapholis incurva</i>	Curly Ryegrass	GRAMINEAE	28/10/1945
<i>Parentucellia latifolia</i>	Red Bartsia	SCROPHULARIACEAE	1/01/1974
<i>Paspalum dilatatum</i>	Paspalum	GRAMINEAE	1/01/1973
<i>Pennisetum clandestinum</i>	Kikuyu	GRAMINEAE	1/01/1987
<i>Pennisetum macrourum</i>	African Feather-grass	GRAMINEAE	23/12/2005
<i>Pennisetum setaceum</i>	Fountain Grass	GRAMINEAE	29/05/1949
<i>Pennisetum villosum</i>	Feather-top	GRAMINEAE	27/05/1973
<i>Pentaschistis pallida</i>	Pussy Tail	GRAMINEAE	22/10/1972
<i>Phalaris aquatica</i>	Phalaris	GRAMINEAE	9/11/1977
<i>Phalaris canariensis</i>	Canary-grass	GRAMINEAE	1/01/1974
<i>Phalaris minor</i>	Lesser Canary-grass	GRAMINEAE	2/11/1972
<i>Phalaris paradoxa</i>	Paradox Canary-grass	GRAMINEAE	10/12/1965
<i>Phalaris</i> sp.	Canary Grass	GRAMINEAE	1/10/1993
<i>Physalis peruviana</i>	Cape Gooseberry	SOLANACEAE	31/12/1957
<i>Picnoman acarna</i>	Soldier Thistle	COMPOSITAE	6/02/1980
<i>Pinus halepensis</i>	Aleppo Pine	PINACEAE	9/09/1972
<i>Piptatherum miliaceum</i>	Rice Millet	GRAMINEAE	28/09/1960
<i>Plantago lanceolata</i> var. <i>lanceolata</i>	Ribwort	PLANTAGINACEAE	1/01/1970
<i>Poa annua</i>	Winter Grass	GRAMINEAE	18/09/1928
<i>Poa bulbosa</i>	Bulbous Meadow-grass	GRAMINEAE	18/10/1968
<i>Poa pratensis</i>	Kentucky Blue-grass	GRAMINEAE	14/11/1943

> Continued on next page

Appendix 1: Flora | Introduced Flora (weeds)



SPECIES NAME	COMMON NAME	FAMILY NAME	DATE
<i>Polycarpon tetraphyllum</i>	Four-leaf Allseed	CARYOPHYLLACEAE	7/01/1960
<i>Polygonum aviculare</i>	Wireweed	POLYGONACEAE	14/01/1971
<i>Polypogon viridis</i>	Water Bent	GRAMINEAE	18/11/1973
<i>Populus alba</i>	White Poplar	SALICACEAE	8/10/1973
<i>Populus nigra</i>	Lombardy Poplar	SALICACEAE	1/01/1974
<i>Potamogeton crispus</i>	Curly Pondweed	POTAMOGETONACEAE	2/12/1951
<i>Prunus cerasifera</i>	Cherry-plum	ROSACEAE	3/09/1981
<i>Prunus persica</i> var. <i>nectarina</i>	Nectarine	ROSACEAE	8/09/1983
<i>Prunus persica</i> var. <i>persica</i>	Peach	ROSACEAE	16/04/1957
<i>Pyrus communis</i>	Pear	ROSACEAE	18/04/1957
<i>Ranunculus muricatus</i>	Pricklefruit Buttercup	RANUNCULACEAE	25/10/1977
<i>Ranunculus repens</i>	Creeping Buttercup	RANUNCULACEAE	11/10/1943
<i>Raphanus raphanistrum</i>	Wild Radish	CRUCIFERAE	15/10/1930
<i>Rapistrum rugosum</i> ssp. <i>rugosum</i>	Turnip Weed	CRUCIFERAE	1/01/1974
<i>Reseda lutea</i>	Cut-leaf Mignonette	RESEDACEAE	24/10/1989
<i>Rhamnus alaternus</i>	Blowfly Bush	RHAMNACEAE	1/01/1970
<i>Ricinus communis</i>	Castor Oil Plant	EUPHORBIACEAE	23/10/1987
<i>Romulea minutiflora</i>	Small-flower Onion-grass	IRIDACEAE	10/09/1908
<i>Romulea rosea</i> var. <i>australis</i>	Common Onion-grass	IRIDACEAE	10/09/1908
<i>Romulea</i> sp.	Onion-grass	IRIDACEAE	18/04/2001
<i>Rorippa nasturtium-aquaticum</i>	Watercress	CRUCIFERAE	1/01/1944
<i>Rosa canina</i>	Dog Rose	ROSACEAE	14/10/1972
<i>Rosa rubiginosa</i>	Sweet Briar	ROSACEAE	4/07/1905
<i>Rostraria cristata</i>	Annual Cat's-tail	GRAMINEAE	1/10/1913
<i>Rostraria pumila</i>	Tiny Bristle-grass	GRAMINEAE	20/11/1981
<i>Rubus laciniatus</i>	Cut-leaf Blackberry	ROSACEAE	13/11/1977
<i>Rubus</i> sp.	Blackberry	ROSACEAE	1/01/1987
<i>Rumex conglomeratus</i>	Clustered Dock	POLYGONACEAE	1/01/1904
<i>Rumex crispus</i>	Curled Dock	POLYGONACEAE	18/11/1973
<i>Sagina apetala</i>	Annual Pearlwort	CARYOPHYLLACEAE	1/10/1921
<i>Salix babylonica</i>	Weeping Willow	SALICACEAE	8/10/1973
<i>Salix cinerea</i>	Grey Sallow	SALICACEAE	1994
<i>Salpichroa origanifolia</i>	Pampas Lily-of-the-valley	SOLANACEAE	1/01/1900
<i>Salvia verbenaca</i> var. <i>verbenaca</i>	Wild Sage	LABIATAE	1/01/1974
<i>Sambucus nigra</i>	Common Elder		5/11/1956
<i>Sanguisorba minor</i> ssp. <i>muricata</i>	Sheep's Burnet	ROSACEAE	28/11/1931
<i>Scorzonera laciniata</i>	Scorzonera	COMPOSITAE	16/11/1936
<i>Senecio angulatus</i>	Cape Ivy	COMPOSITAE	5/06/1964
<i>Senecio pterophorus</i>	African Daisy	COMPOSITAE	1/01/1987
<i>Senecio vulgaris</i>	Common Groundsel	COMPOSITAE	16/09/1993
<i>Setaria parviflora</i>	Slender Pigeon-grass	GRAMINEAE	3/01/1979
<i>Setaria pumila</i> ssp. <i>pumila</i>	Pale Pigeon-grass	GRAMINEAE	26/04/1908
<i>Setaria verticillata</i>	Whorled Pigeon-grass	GRAMINEAE	4/03/1946
<i>Sherardia arvensis</i>	Field Madder	RUBIACEAE	24/10/2001
<i>Silene gallica</i> var. <i>gallica</i>	French Catchfly	CARYOPHYLLACEAE	23/10/1904
<i>Silene gallica</i> var. <i>quinquevulnera</i>	French Catchfly	CARYOPHYLLACEAE	14/09/1948

> Continued on next page

Appendix 1: Flora | Introduced Flora (weeds)



SPECIES NAME	COMMON NAME	FAMILY NAME	DATE
<i>Silene nocturna</i>	Mediterranean Catchfly	CARYOPHYLLACEAE	1/01/1974
<i>Silene pseudoatocion</i>		CARYOPHYLLACEAE	3/09/1995
<i>Silene vulgaris</i>	Bladder Champion	CARYOPHYLLACEAE	24/10/1909
<i>Silybum marianum</i>	Variogated Thistle	COMPOSITAE	30/11/1943
<i>Sinapis arvensis</i>	Charlock	CRUCIFERAE	5/08/1906
<i>Sisymbrium irio</i>	London Mustard	CRUCIFERAE	19/09/1947
<i>Sisymbrium officinale</i>	Hedge Mustard	CRUCIFERAE	2/11/1972
<i>Solanum cinereum</i>	Narrawa Burr	SOLANACEAE	1/12/1918
<i>Solanum linnaeanum</i>	Apple Of Sodom	SOLANACEAE	1/10/1913
<i>Solanum mauritanium</i>	Wild Tobacco Tree	SOLANACEAE	4/06/1965
<i>Solanum nigrum</i>	Black Nightshade	SOLANACEAE	9/10/1948
<i>Solanum pseudocapsicum</i>	Jerusalem Cherry	SOLANACEAE	1/12/1999
<i>Solanum tuberosum</i>	Potato	SOLANACEAE	12/02/1975
<i>Solidago canadensis</i>	Golden Rod	COMPOSITAE	6/03/1952
<i>Soliva pterosperma</i>	Jo-jo	COMPOSITAE	8/11/1984
<i>Sonchus asper</i> ssp. <i>asper</i>	Rough Sow-thistle	COMPOSITAE	9/11/1977
<i>Sonchus asper</i> ssp. <i>glaucescens</i>	Rough Sow-thistle	COMPOSITAE	8/02/1956
<i>Sonchus oleraceus</i>	Common Sow-thistle	COMPOSITAE	9/11/1977
<i>Sparaxis bulbifera</i>	Sparaxis	IRIDACEAE	30/09/1990
<i>Sparaxis tricolor</i>	Tricolor Harlequin Flower	IRIDACEAE	18/10/1905
<i>Sparaxis villosa</i>		IRIDACEAE	29/10/1997
<i>Tanacetum boreale</i>	Lesser Tansy	COMPOSITAE	15/03/1949
<i>Tanacetum parthenium</i>	Feverfew	COMPOSITAE	26/01/1962
<i>Taraxacum erythrospermum</i>	Red-seed Dandelion	COMPOSITAE	23/11/1982
<i>Taraxacum pseudocalocephalum</i>		COMPOSITAE	1/01/1982
<i>Tarilis nodosa</i>	Knotted Hedge-parsley	UMBELLIFERAE	22/11/1908
<i>Tragopogon porrifolius</i>	Salsify	COMPOSITAE	7/11/1977
<i>Trifolium angustifolium</i>	Narrow-leaf Clover	LEGUMINOSAE	27/10/1973
<i>Trifolium arvense</i> var. <i>arvense</i>	Hare's-foot Clover	LEGUMINOSAE	2/11/1972
<i>Trifolium campestre</i>	Hop Clover	LEGUMINOSAE	1/01/1900
<i>Trifolium cherleri</i>	Cupped Clover	LEGUMINOSAE	28/10/1945
<i>Trifolium dubium</i>	Suckling Clover	LEGUMINOSAE	10/12/1904
<i>Trifolium fragiferum</i> var. <i>fragiferum</i>	Strawberry Clover	LEGUMINOSAE	1/01/1974
<i>Trifolium glomeratum</i>	Cluster Clover	LEGUMINOSAE	8/11/1945
<i>Trifolium lappaceum</i>	Bristly Clover	LEGUMINOSAE	22/11/1947
<i>Trifolium resupinatum</i> var. <i>resupinatum</i>	Shaftal Clover	LEGUMINOSAE	30/11/1983
<i>Trifolium scabrum</i>	Rough Clover	LEGUMINOSAE	8/11/1945
<i>Trifolium subterraneum</i>	Subterranean Clover	LEGUMINOSAE	1/08/1918
<i>Trifolium tomentosum</i>	Woolly Clover	LEGUMINOSAE	4/11/1945
<i>Tripteris clandestina</i>	Tripteris	COMPOSITAE	8/09/1971
<i>Tritonia lineata</i>	Lined Tritonia	IRIDACEAE	24/10/1909
<i>Tritonia</i> sp.	Tritonia	IRIDACEAE	1/01/1974
<i>Tritonia squalida</i>		IRIDACEAE	8/10/1973
<i>Tropaeolum majus</i>	Nasturtium	TROPAEOLACEAE	16/10/1972
<i>Ulex europaeus</i>	Gorse	LEGUMINOSAE	20/03/1970
<i>Urospermum picroides</i>	False Hawkbit	COMPOSITAE	1/09/1908

> Continued on next page

Appendix 1: Flora | Introduced Flora (weeds)



SPECIES NAME	COMMON NAME	FAMILY NAME	DATE
<i>Urtica urens</i>	Small Nettle	URTICACEAE	30/11/1944
<i>Vaccaria hispanica</i>	Cow Soapwort	CARYOPHYLLACEAE	3/11/1934
<i>Verbascum sp.</i>	Mullein	SCROPHULARIACEAE	1994
<i>Veronica arvensis</i>	Wall Speedwell	SCROPHULARIACEAE	12/10/1935
<i>Veronica persica</i>	Persian Speedwell	SCROPHULARIACEAE	12/11/1950
<i>Vicia hirsuta</i>	Hairy Vetch	LEGUMINOSAE	18/10/1942
<i>Vicia monantha</i>	Spurred Vetch	LEGUMINOSAE	1/01/1942
<i>Vicia monantha ssp. monantha</i>	One-flower Vetch	LEGUMINOSAE	22/11/1942
<i>Vicia sativa ssp. cordata</i>		LEGUMINOSAE	18/09/1928
<i>Vicia sativa ssp. nigra</i>	Narrow-leaf Vetch	LEGUMINOSAE	24/10/1942
<i>Vicia sativa ssp. sativa</i>	Common Vetch	LEGUMINOSAE	23/09/1972
<i>Vicia tetrasperma</i>	Slender Vetch	LEGUMINOSAE	22/11/1942
<i>Vinca major</i>	Blue Periwinkle	APOCYNACEAE	5/08/1972
<i>Watsonia meriana var. bulbifera</i>	Bulbil Watsonia	IRIDACEAE	1/01/1987
<i>Withania somnifera</i>	Winter Cherry	SOLANACEAE	4/04/1990
<i>Zantedeschia aethiopica</i>	White Arum Lily	ARACEAE	25/10/1977

Appendix 2: Fauna | Birds



Fauna		Conservation Rating					Likelihood		OBSERVED SINCE 2000
SPECIES NAME	COMMON NAME	AUS	SA	SML	BC	RESIDENCY	SPECIES OCCURRENCE	SPECIES INCREASE WITH MORE HABITAT	
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill				U	Res			
<i>Acanthiza lineata</i>	Striated Thornbill				U	Res			
<i>Acanthiza nana</i>	Yellow Thornbill			U	R	Irr			
<i>Acanthiza pusilla</i>	Brown Thornbill				U	Res		✓	✓
<i>Acanthiza reguloides</i>	Buff-rumped Thornbill				U	Res			
<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill			V					
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill				U#	Res/Aut		✓	✓
<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk				R#	Res		✓	
<i>Accipiter fasciatus</i>	Brown Goshawk				R#	Res			
<i>Acrocephalus stentoreus</i>	Clamorous Reed-warbler				R	Spr		✓	
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar			U	R	Res			
<i>Alcedo azurea</i>	Azure Kingfisher		E	EX	EX				
<i>Anas gracilis</i>	Grey Teal				R	Irr		✓	
<i>Anas superciliosa</i>	Pacific Black Duck				U#	Res		✓	✓
<i>Anthochaera carunculata</i>	Red Wattlebird				C#	Res		✓	✓
<i>Anthochaera chrysoptera</i>	Little Wattlebird			U	C#	Res		✓	
<i>Anthus novaeseelandiae</i>	Richard's Pipit				R	Irr			
<i>Apus pacificus</i>	Fork-tailed Swift				R#	Spr			
<i>Aquila audax</i>	Wedge-tailed Eagle				R	Irr			✓
<i>Ardea ibis</i>	Cattle Egret			U	R	Irr			
<i>Artamus cyanopterus</i>	Dusky Woodswallow				U	Res			✓
<i>Artamus superciliosus</i>	White-browed Woodswallow				R	Spr			
<i>Artamus personatus</i>	Masked Woodswallow				R	Spr			
<i>Barnardius zonarius</i>	Australian Ringneck				R#	Irr			
<i>Botaurus poiciloptilus</i>	Australasian Bittern		V	V	O	Irr			
<i>Burhinus magnirostris</i>	Bush Stone-curlew		V	EX	EX	EX			
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo			U	U#	Res			✓
<i>Cacatua roseicapilla</i>	Galah				C#	Res			✓
<i>Cacatua sanguinea</i>	Little Corella				U#	Spr			✓
<i>Cacatua tenuirostris</i>	Long-billed Corella				U*#	Spr			
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo				U#	Aut			
<i>Calamanthus campestris</i>	Rufous (Western) Fieldwren			EX	EX	EX			
<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo		V	V	U#	Irr		✓	✓
<i>Calyptorhynchus lathami</i>	Glossy Black Cockatoo		E	E	EX	EX			
<i>Chenonetta jubata</i>	Australian Wood Duck, (Maned Duck)				U#	Res		✓	✓
<i>Chrysococcyx basalis</i>	Horsfield's Bronze-cuckoo				U	Spr			
<i>Chrysococcyx lucidus</i>	Shining Bronze-cuckoo		R	R	R	Spr			
<i>Cinchorhamphus mathewsi</i>	Rufous Songlark				R	Spr			
<i>Cinclosoma punctatum anachoreta</i>	Mount Lofty Ranges Spotted Quailthrush		E	E	R	EX			
<i>Colluricincla harmonica</i>	Grey Shrike-thrush				U	Res		✓	
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike				C#	Res		✓	✓

> Continued on next page

Appendix 2: Fauna | Birds



Fauna		Conservation Rating					Likelihood		OBSERVED SINCE 2000
SPECIES NAME	COMMON NAME	AUS	SA	SML	BC	RESIDENCY	SPECIES OCCURRENCE	SPECIES INCREASE WITH MORE HABITAT	
<i>Coracina robusta</i>	White-bellied (Little) Cuckoo-shrike		R	EX	R	Aut			
<i>Cormobates leucophaeus</i>	White-throated Treecreeper			U	U	Res			
<i>Corvus mellori</i>	Little Raven				C#	Res			
<i>Coturnix chinensis</i>	King Quail		E	E	EX	EX			
<i>Coturnix pectoralis</i>	Stubble Quail				R	Spr			✓
<i>Cracticus torquatus</i>	Grey Butcherbird			U					
<i>Cuculus pallidus</i>	Pallid Cuckoo				R	Spr			
<i>Cygnus atratus</i>	Black Swan				R	Irr			
<i>Dacelo novaeguineae</i>	Laughing Kookaburra			C	U#	Res	✓		✓
<i>Daphoenositta chrysoptera</i>	Varied Sittella				R	Res			
<i>Dicaeum hirundinaceum</i>	Mistletoebird				U#	Res	✓		✓
<i>Egretta novaehollandiae</i>	White-faced Heron				U#	Res			✓
<i>Egretta pacifica</i>	White-necked Heron				R	Irr			
<i>Elanus axillaris</i>	Black-shouldered Kite				R	Irr			
<i>Entomozon cyanotis</i>	Blue-faced Honeyeater		R	EX	EX	EX			
<i>Eudynamis scolopacea</i>	Common Koel				O#	Irr			✓
<i>Eurostopodus argus</i>	Spotted Nightjar			V	R	Irr			
<i>Falco berigora</i>	Brown Falcon				R	Irr			✓
<i>Falco cenchroides</i>	Nankeen Kestrel				U	Res			
<i>Falco longipennis</i>	Australian Hobby			U	U#	Res	✓		
<i>Falco peregrinus</i>	Peregrine Falcon		R	R	R	Res			
<i>Falunculus frontatus</i>	Crested Shrike-tit		V	V	R	Res	✓		
<i>Fulica atra</i>	Eurasian Coot				U	Irr			
<i>Gallinula tenebrosa</i>	Dusky Moorhen				U	Irr			
<i>Gallinula ventralis</i>	Black-tailed Native-hen				R	Irr			✓
<i>Gallirallus philippensis</i>	Buff-banded Rail			U	U#	Spr			✓
<i>Geopelia placida</i>	Peaceful Dove			V	R	Res			✓
<i>Glossopsitta concinna</i>	Musk Lorikeet				C#	Res			✓
<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet				C#	Res			
<i>Glossopsitta pusilla</i>	Little Lorikeet		V	V	R	Irr			
<i>Gallina cyanoleuca</i>	Magpie-lark				C#	Res			✓
<i>Gymnorhina tibicen</i>	Australian Magpie				C#	Res			✓
<i>Haliastur sphenurus</i>	Whistling Kite				R	Irr			
<i>Hirundapus caudacutus</i>	White-throated Needletail				R	Spr			
<i>Hirundo neoxena</i>	Welcome Swallow				C#	Res			
<i>Lalage sueurii</i>	White-winged Triller				R	Spr			
<i>Larus novaehollandiae</i>	Silver Gull				U#	Irr			
<i>Lathanus discolour</i>	Swift Parrot		E	E	R	Aut			✓
<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater				U	Aut			✓
<i>Lichenostomus ornatus</i>	Yellow-plumed Honeyeater				R	Irr			
<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater				C#	Res	✓		✓

> Continued on next page

Appendix 2: Fauna | Birds



Fauna		Conservation Rating					Likelihood		OBSERVED SINCE 2000
SPECIES NAME	COMMON NAME	AUS	SA	SML	BC	RESIDENCY	SPECIES OCCURRENCE	SPECIES INCREASE WITH MORE HABITAT	
<i>Lophoictinia isura</i>	Square-tailed Kite		V	V	R	Irr			
<i>Malurus cyaneus</i>	Superb Fairy-wren			C	U	Res		✓	✓
<i>Malurus lamberti</i>	Variiegated Fairy-wren				EX	EX			
<i>Manorina melanocephala</i>	Noisy Miner			C	C#	Res		✓	✓
<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater				R	Res			
<i>Melithreptus gularis</i>	Black-chinned Honeyeater		V	V	R	Res			
<i>Melithreptus lunatus</i>	White-naped Honeyeater			C	U	Res			✓
<i>Melopsittacus undulatus</i>	Budgerigar				R	Spr			
<i>Myiagra inquieta</i>	Restless Flycatcher		U	V	R	Res			
<i>Myiagra rubecula</i>	Leaden Flycatcher				O	Aut			
<i>Neochmia temporalis</i>	Red-browed Finch				U	Res		✓	✓
<i>Ninox connivens</i>	Barking Owl		R	V	EX	EX			
<i>Ninox novaeseelandiae</i>	Southern Boobook				U#	Res		✓	✓
<i>Ninox strenua</i>	Powerful Owl				EX	EX			
<i>Nymphicus hollandicus</i>	Cockatiel				R	Spr			✓
<i>Ocyphaps lophotes</i>	Crested Pigeon				C#	Res			✓
<i>Oriolus sagittatus</i>	Olive-backed Oriole		R	R	R#	Aut			
<i>Pachycephala inornata</i>	Gilbert's Whistler				EX	EX			
<i>Pachycephala pectoralis</i>	Golden Whistler			O	U	Res			✓
<i>Pachycephala rufiventris</i>	Rufous Whistler			C	U	Spr		✓	
<i>Pardalotus punctatus</i>	Spotted Pardalote			U	U	Res		✓	✓
<i>Pardalotus striatus</i>	Striated Pardalote				C#	Res		✓	✓
<i>Petrochelidon ariel</i>	Fairy Martin				R	Spr			
<i>Petrochelidon nigricans</i>	Tree Martin				U	Spr			
<i>Petroica goodenovii</i>	Red-capped Robin				R	Aut			
<i>Petroica multicolor boodang</i>	Scarlet Robin			U	R	Res			
<i>Petroica phoenicea</i>	Flame Robin		R	R	R	Aut			
<i>Pezoporus wallicus</i>	Ground (Swamp) Parrot		EX	EX	EX	EX			
<i>Phalacrocorax melanoleucos</i>	Little Pied Cormorant				U	Irr			
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant				U	Irr			
<i>Phaps chalcoptera</i>	Common Bronzewing				U	Res		✓	✓
<i>Phaps elegans</i>	Brush Bronzewing			U	R	Res			
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater				C#	Res		✓	✓
<i>Phylidonyris pyrrhoptera</i>	Crescent Honeyeater				U	Res			✓
<i>Platycercus elegans x flaveolus</i>	Adelaide Rosella				C#	Res		✓	✓
<i>Platycercus eximius</i>	Eastern Rosella				U#	Res			✓
<i>Plectorhyncha lanceolata</i>	Striped Honeyeater		R	EX	EX	EX			
<i>Podargus strigoides</i>	Tawny Frogmouth			C	R	Res			✓
<i>Pomatostomus superciliosus</i>	White-browed Babbler			V	R	Res			
<i>Psephotus haematanotus</i>	Red-rumped Parrot				U#	Res		✓	✓
<i>Pteropodocys maxima</i>	Ground Cuckoo-shrike				EX	EX			
<i>Rhipidura fuliginosa</i>	Grey Fantail				U	Res		✓	✓
<i>Rhipidura leucophrys</i>	Willie Wagtail				C#	Res			✓

> Continued on next page

Appendix 2: Fauna | Birds



Fauna		Conservation Rating					Likelihood		OBSERVED SINCE 2000
SPECIES NAME	COMMON NAME	AUS	SA	SML	BC	RESIDENCY	SPECIES OCCURRENCE	SPECIES INCREASE WITH MORE HABITAT	
<i>Rostratula benghalensis</i>	Painted Snipe		V	V	EX	EX			
<i>Sericornis frontalis</i>	White-browed Scrubwren			U	U	Res		✓	✓
<i>Smicromis brevirostris</i>	Weebill			C	U	Res		✓	
<i>Stagonopleura bella</i>	Beautiful Firetail		R	E	EX	EX			
<i>Stagonopleura guttata</i>	Diamond Firetail		V	V	R	Irr			
<i>Strepera versicolor</i>	Grey Currawong			U	U	Res		✓	✓
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe				R	Irr			
<i>Taeniopygia guttata</i>	Zebra Finch			U	R	Res			
<i>Threskiornis spinicollis</i>	Straw-necked Ibis				R	Irr			
<i>Todiramphus sanctus</i>	Sacred Kingfisher				R	Spr			
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet				C#	Res			✓
<i>Turnix velox</i>	Little Button-quail				R	Spr			
<i>Tyto alba</i>	Barn Owl				R	Aut			
<i>Vanellus miles</i>	Masked Lapwing				U#	Res			✓
<i>Vanellus tricolor</i>	Banded Lapwing				R	Irr			
<i>Xanthomyza phrygia</i>	Regent Honeyeater		E	E	R	Aut			
<i>Zosterops lateralis</i>	Silveryeye				C#	Res		✓	✓
* <i>Anas platyrhynchos</i>	Mallard				U#	Res			✓
* <i>Carduelis carduelis</i>	European Goldfinch				U#	Res			✓
* <i>Carduelis chloris</i>	European Greenfinch				R#	Spr			
* <i>Columba livia</i>	Rock Dove (Feral Pigeon)				C#	Res			✓
* <i>Passer domesticus</i>	House Sparrow				C#	Res			✓
* <i>Streptopelia chinensis</i>	Spotted Turtle-dove				C#	Res			✓
* <i>Sturnus vulgaris</i>	Common Starling				C#	Res			✓
* <i>Turdus merula</i>	Eurasian Blackbird				C#	Res			✓

* Non-native or feral species

KEY

Regions

AUS = Australia, **SA** = South Australia, **SML** = Southern Mount Lofty Botanical Region, **BC** = Burnside City Council

Conservation Ratings

EX = Extinct: all known populations extinct within the wild, **E** = Endangered: rare and in danger of becoming extinct, **V** = Vulnerable: rare and at risk from potential threats, **R** = Rare: has a low overall frequency of occurrence. Warrants monitoring and protective measures, **C** = Common: commonly observed and does not warrant protective measures, **U** = Uncommon: less common but not rare enough to warrant special protective measures, **O** = Occasional: species that are not common but are regular visitors to a region (e.g. migratory waders). Because they do not breed locally they have not been given a regional conservation rating

Date observed

O = casual observation by staff or resident since 2000. Not all fauna species detailed here have been previously recorded within Burnside City Council and therefore not all species will have a date listed in which they were observed. Those species not observed within the Council area before are thought to have either inhabited the region previously, or still may inhabit the area today (as determined through discussions with SA Museum staff)

Extra Key for Birds

Res = species thought to be resident throughout the year in the City of Burnside, **Irr** = species that are irregular visitors to the City of Burnside, **Spr** = species that are spring-summer visitors to the City of Burnside, **Aut** = species that are autumn-winter visitors to the City of Burnside, **#** = likely to be present within residential areas of the City of Burnside

Data Source: South Australian Department for Environment and Heritage database. Additional information sourced from relevant SA Museum staff: Mark Hutchinson (Reptiles), Andrew Graham (Birds), and Cath Kemper (Mammals). Terry Reardon was also consulted for his expertise on bats.

Appendix 2: Fauna | Amphibia



Appendix 2b—Amphibia

Fauna		Conservation Rating				Likelihood		OBSERVED SINCE 2000
SPECIES NAME	COMMON NAME	AUS	SA	SML	BC	SPECIES OCCURRING	INCREASE WITH MORE HABITAT	
<i>Crinia signifera</i>	Common Froglet					Mod	✓	✓
<i>Limnodynastes dumerilii</i>	Eastern Banjo Frog					Mod	✓	✓
<i>Limnodynastes tasmaniensis</i>	Spotted Grass Frog					Mod	✓	✓
<i>Litoria ewingi</i>	Brown Tree Frog					Mod	✓	✓
<i>Litoria raniformis</i>	Golden Bell Frog					Low		
<i>Neobatrachus pictus</i>	Painted Frog					Low - Mod	✓	
<i>Pseudophryne bibroni</i>	Brown Toadlet					Mod		

KEY

Regions

AUS = Australia, **SA** = South Australia, **SML** = Southern Mount Lofty Botanical Region, **BC** = Burnside City Council

Conservation Ratings

EX = Extinct: all known populations extinct within the wild, **E** = Endangered: rare and in danger of becoming extinct, **V** = Vulnerable: rare and at risk from potential threats, **R** = Rare: has a low overall frequency of occurrence. Warrants monitoring and protective measures, **C** = Common: commonly observed and does not warrant protective measures, **U** = Uncommon: less common but not rare enough to warrant special protective measures, **O** = Occasional: species that are not common but are regular visitors to a region (e.g. migratory waders). Because they do not breed locally they have not been given a regional conservation rating

Date observed

O = casual observation by staff or resident since 2000. Not all fauna species detailed here have been previously recorded within Burnside City Council and therefore not all species will have a date listed in which they were observed. Those species not observed within the Council area before are thought to have either inhabited the region previously, or still may inhabit the area today (as determined through discussions with SA Museum staff)

Data Source: South Australian Department for Environment and Heritage database. Additional information sourced from relevant SA Museum staff: Mark Hutchinson (Reptiles), Andrew Graham (Birds), and Cath Kemper (Mammals). Terry Reardon was also consulted for his expertise on bats.

Appendix 2: Fauna | Mammalia



Appendix 2c—Mammalia

Fauna		Conservation Rating				Likelihood		OBSERVED SINCE 2000
SPECIES NAME	COMMON NAME	AUS	SA	SML	BC	SPECIES OCCURRING	INCREASE WITH MORE HABITAT	
<i>Acrobates pygmaeus</i>	Feathertail Glider			EX		EX		
<i>Antechinus flavipes</i>	Yellow-footed Antechinus					Low - Mod	✓	✓
<i>Bettongia lesueur</i>	Burrowing Bettong			EX		EX		
<i>Bettongia penicillata</i>	Brush-tailed Bettong			EX		EX		
<i>Canis lupus dingo</i>	Dingo			EX		EX		
<i>Cercartetus concinnus</i>	Western Pygmy-possum			EX		EX		
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat					High	✓	
<i>Chalinolobus morio</i>	Chocolate Wattled Bat					High	✓	
<i>Conilurus albigipes</i>	White-footed Tree-rat			EX		EX		
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll			EX		EX		
<i>Dasyurus viverrinus</i>	Eastern Quoll			EX		EX		
<i>Hydromys chrysogaster</i>	Water Rat					Low	✓	
<i>Isaodon obesulus obesulus</i>	Southern Brown Bandicoot	E	V			Low	✓	
<i>Lasiorhinus latifrons</i>	Southern Hairy-nosed Wombat			EX		EX		
<i>Macropus eugenii</i>	Tammar Wallaby			EX		EX		
<i>Macropus fuliginosus</i>	Western Grey Kangaroo					Mod	✓	✓
<i>Macrotis lagotis</i>	Greater Bilby			EX		EX		
<i>Miniopterus schreibersii</i>	Common Bentwing-bat			EX		EX		
<i>Mormopterus planiceps</i>	Southern Freetail-bat					Mod - High	✓	
<i>Myrmecobius fasciatus</i>	Numbat			EX		EX		
<i>Notomys mitchellii</i>	Mitchell's Hopping Mouse			EX		EX		
<i>Nyctinomys australis</i>	White-striped Freetail-bat					Mod		
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat					Mod - High	✓	
<i>Ornithorhynchus anatinus</i>	Platypus			EX		EX		
<i>Perameles bouganville</i>	Western Barred Bandicoot			EX		EX		
<i>Phascogale tapaoatafa</i>	Brush-tailed Phascogale			EX		EX		
<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum					High	✓	✓
<i>Pteropus scapulatus</i>	Little Red Flying Fox					Low - Nomadic		
<i>Rattus fuscipes</i>	Bush Rat					Low - Mod	✓	
<i>Rattus lutreolus</i>	Swamp Rat					Low - Mod	✓	
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat					Low - Nomadic		
<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat					Low		
<i>Sminthopsis crassicaudata</i>	Fat-tailed Dunnart			EX		EX		
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna					Mod	✓	✓
<i>Trichosurus vulpecula</i>	Common Brushtail Possum					High	✓	✓
<i>Vespadelus darlingtoni</i>	Large Forest Bat					Mod - High	✓	
<i>Vespadelus regulus</i>	Southern Forest Bat					Mod - High	✓	
<i>Vespadelus vulturinus</i>	Little Forest Bat					Mod	✓	
<i>Vombatus ursinus</i>	Common Wombat			EX		EX		
* <i>Felis catus</i>	Feral Cat					Mod	✓	✓
* <i>Lepus capensis</i>	Brown Hare					High		
* <i>Mus musculus</i>	House Mouse					High		✓
* <i>Oryctolagus cuniculus</i>	European Rabbit					High		✓
* <i>Phascogale cinereus</i>	Koala					High		✓
* <i>Rattus norvegicus</i>	Brown Rat					Mod		✓
* <i>Rattus rattus</i>	Black Rat					High		
* <i>Vulpes vulpes</i>	Fox					High		✓

* Non-native or feral species

Appendix 2: Fauna | Reptilia



Fauna		Conservation Rating				Likelihood		DATE OBSERVED
SPECIES NAME	COMMON NAME	AUS	SA	SML	BC	SPECIES OCCURRING	INCREASE WITH MORE HABITAT	
<i>Aprasia inaurita</i>	Red-tailed Worm-lizard					Low		
<i>Aprasia striolata</i>	Lined Worm-lizard					Mod	✓	1-Jan-1950
<i>Austrelaps labialis</i>	Pygmy Copperhead					Low		
<i>Chelodina longicollis</i>	Common Long-necked Tortoise					High		2007
<i>Christinus marmoratus</i>	Marbled Gecko					High	✓	21-Jan-1981
<i>Cryptoblepharus carnabyi cac</i>	Desert Wall Skink					Low		17-Jun-1985
<i>Ctenophorus decresii</i>	Tawny Dragon					Low		1-Jan-1950
<i>Ctenotus robustus</i>	Eastern Striped Skink					Mod	✓	1-Jan-1950
<i>Ctenotus uber orientalis</i>	Eastern Spotted Ctenotus					Mod	✓	2001
<i>Delma moleri</i>	Adelaide Snake-lizard					Mod	✓	03-Dec-1949
<i>Diplodactylus intermedius</i>	Eastern Spiny-tailed Gecko					Mod	✓	
<i>Diplodactylus vittatus</i>	Eastern Stone Gecko					Low		
<i>Egernia cunninghami</i>	Cunningham's Skink		V			Low		9-Dec-1896
<i>Egernia striolata</i>	Striolated Skink					Low		
<i>Egernia whitii</i>	White's Skink					Mod	✓	
<i>Eulamprus quoyii</i>	Eastern Water Skink					Mod	✓	2-Jan-2000
<i>Gehyra variegata</i>	Tree Dtella					Low		
<i>Hemiergis decresiensis</i>	Three-toed Earless Skink					High	✓	30-Nov-1975
<i>Hemiergis peronii</i>	Four-toed Earless Skink					High	✓	
<i>Lampropholis guichenoti</i>	Garden Skink					High	✓	
<i>Lerista bougainvillii</i>	Bougainville's Skink					High	✓	
<i>Lerista dorsalis</i>	Southern Four-toed Slider					Mod	✓	
<i>Lerista terdigitata</i>	Southern Three-toed Slider					Low		
<i>Lialis burtonis</i>	Burton's Legless Lizard					Low		01-Jan-1950

KEY

Regions

AUS = Australia, SA = South Australia, SML = Southern Mount Lofty Botanical Region, BC = Burnside City Council

Conservation Ratings

EX = Extinct: all known populations extinct within the wild, E = Endangered: rare and in danger of becoming extinct, V = Vulnerable: rare and at risk from potential threats, R = Rare: has a low overall frequency of occurrence. Warrants monitoring and protective measures, C = Common: commonly observed and does not warrant protective measures, U = Uncommon: less common but not rare enough to warrant special protective measures, O = Occasional: species that are not common but are regular visitors to a region (e.g. migratory waders). Because they do not breed locally they have not been given a regional conservation rating

Date observed

O = casual observation by staff or resident since 2000. Not all fauna species detailed here have been previously recorded within Burnside City Council and therefore not all species will have a date listed in which they were observed. Those species not observed within the Council area before are thought to have either inhabited the region previously, or still may inhabit the area today (as determined through discussions with SA Museum staff)

Data Source: South Australian Department for Environment and Heritage database. Additional information sourced from relevant SA Museum staff: Mark Hutchinson (Reptiles), Andrew Graham (Birds), and Cath Kemper (Mammals). Terry Reardon was also consulted for his expertise on bats.

Appendix 2: Fauna | Reptilia



Fauna		Conservation Rating				Likelihood		DATE OBSERVED
SPECIES NAME	COMMON NAME	AUS	SA	SML	BC	SPECIES OCCURRING	INCREASE WITH MORE HABITAT	
<i>Menetia greyii</i>	Dwarf Skink					High	✓	12-Oct-1999
<i>Morethia adelaidensis</i>	Adelaide Snake-eye					Mod	✓	
<i>Morethia obscura</i>	Mallee Snake-eye					Mod	✓	1-Jan-1950
<i>Nephrurus milii</i>	Barking Gecko					High	✓	1-Jan-1950
<i>Pogona barbata</i>	Eastern Bearded Dragon					Mod	✓	12-Oct-1999
<i>Pseudechis porphyriacus</i>	Red-bellied Black Snake					Low		
<i>Pseudomoia entrecasteauxii</i>	Southern Grass Skink					Low		
<i>Pseudonaja textilis</i>	Eastern Brown Snake					High	✓	01-Jan-1950
<i>Pygopus lepidopodus</i>	Common Scaly-foot					Mod	✓	01-Jan-1950
<i>Ramphotyphlops australis</i>	Southern Blind Snake					Low		10-Sep-1972
<i>Ramphotyphlops bituberculatus</i>	Rough-nosed Blind Snake					Low		
<i>Simoselaps bertholdi</i>	Desert Banded Snake					Low		
<i>Suta flagellum</i>	Little Whip Snake					Low	✓	
<i>Suta spectabilis</i>	Mallee Black-headed Snake					Low		
<i>Tiliqua adelaidensis</i>	Pygmy Bluetongue			EX		EX		
<i>Tiliqua rugosa</i>	Sleepy Lizard					High	✓	
<i>Tiliqua scincoides</i>	Eastern Bluetongue					High	✓	24-Feb-1995
<i>Tympanocryptus lineata</i>	Five-lined Earless Dragon					Low		
<i>Varanus rosenbergi</i>	Heath Goanna					Low		

* Non-native or feral species

Appendix 2: Fauna | Insecta



Fauna		Conservation Rating				Likelihood		OBSERVED SINCE 2000
SPECIES NAME	COMMON NAME	AUS	SA	SML	BC	SPECIES OCCURRING	INCREASE WITH MORE HABITAT	
<i>Danaus chrysippus petilia</i>	Lesser Wanderer					Mod	✓	✓
<i>Danaus plexippus plexippus</i>	Monarch					Mod	✓	✓
<i>Eurema smilax</i>	Small Grass Yellow					Mod	✓	✓
<i>Geitoneura klugii</i>	Common Xenica					High	✓	✓
<i>Heteronympha merope</i>	Common Brown					Mod	✓	✓
<i>Junonia villida</i>	Meadow Argus					High	✓	✓
<i>Nacaduba biocellata</i>	Two-spotted Line-blue					Mod-High	✓	
<i>Ocybadistes walkeri</i>	Southern Grass-dart					Low-Mod		
<i>Papilio anactus</i>	Dingy Swallowtail					Mod	✓	
<i>Pieris rapae</i>	Cabbage White					Mod-High	✓	✓
<i>Polyura sempronius</i>	Tailed Emperor					Low-Mod		
<i>Taractrocera papyria</i>	White-banded Grass-dart					Low-Mod		
<i>Vanessa itea</i>	Australian Admiral					Mod	✓	✓
<i>Vanessa kershawi</i>	Australian Painted Lady					Mod	✓	✓
<i>Zizina labradus</i>	Common Blue					Mod-High	✓	✓

* Non-native or feral species

KEY

Regions

AUS = Australia, SA = South Australia, SML = Southern Mount Lofty Botanical Region, BC = Burnside City Council

Conservation Ratings

EX = Extinct: all known populations extinct within the wild, E = Endangered: rare and in danger of becoming extinct, V = Vulnerable: rare and at risk from potential threats, R = Rare: has a low overall frequency of occurrence. Warrants monitoring and protective measures, C = Common: commonly observed and does not warrant protective measures, U = Uncommon: less common but not rare enough to warrant special protective measures, O = Occasional: species that are not common but are regular visitors to a region (e.g. migratory waders). Because they do not breed locally they have not been given a regional conservation rating

Date observed

O = casual observation by staff or resident since 2000. Not all fauna species detailed here have been previously recorded within Burnside City Council and therefore not all species will have a date listed in which they were observed. Those species not observed within the Council area before are thought to have either inhabited the region previously, or still may inhabit the area today (as determined through discussions with SA Museum staff)

Data Source: South Australian Department for Environment and Heritage database. Additional information sourced from relevant SA Museum staff: Mark Hutchinson (Reptiles), Andrew Graham (Birds), and Cath Kemper (Mammals). Terry Reardon was also consulted for his expertise on bats.

Appendix 3: Biodiversity and planning framework



The Biodiversity Strategy aims to build on existing strategies, plans, legislative requirements and agreements that address biodiversity conservation at the international, national, state, regional and local level. The biodiversity planning framework is represented below.

INTERNATIONAL

International agreements

- Ramsar Convention 1971
- Convention on Conservation of Nature in the South Pacific 1976
- Convention on International Trade in Endangered Species of Wild Fauna & Flora 1976
- Convention on the Conservation of Migratory Species of Wild Animals 1979
- Japan-Australia Migratory Birds Agreement 1981
- Vienna Convention on the Protection of the Ozone Layer 1985
- The Montreal Protocol on Substances that Deplete the Ozone Layer 1987
- China-Australia Migratory Birds Agreement 1988
- United Nations Conference on Environment and Development 1992
- United Nations Conference on Climate Change 1992
- Rio Declaration on Environment and Development and Agenda 21 1992
- United Nations Convention on Biological Diversity 1993
- Montreal Process
- Convention on Biological Diversity 2000
- IUCN Red List of Threatened Species

International reporting obligations

- United Nations Environment Programme, Convention on Biological Diversity
- Framework on Climate Change Convention
- Montreal Process for Forestry Reporting
- World Meteorological Organisation

International law

- Ramsar Convention 1971
- World Heritage Convention 1972
- United Nations Convention on the Law of the Sea 1982
- Vienna Convention on the Protection of the Ozone Layer 1985
- Climate Change Convention 1992
- Biodiversity Convention 1992

NATIONAL

National strategies

- Ozone Protection Strategy 1989
- Inter-governmental Agreement on the Environment 1992
- National Strategy for Ecological Sustainable Development 1992
- National Forest Policy Statement 1992
- National Strategy for the Conservation of Australia's Biological Diversity 1996
- National Koala Conservation Strategy 1998
- National Greenhouse Strategy 1998
- National Natural Heritage Charter 1999 and the Burra Charter 1999
- National Framework for Management & Monitoring Australia's Native Vegetation 1999
- National Weeds Strategy 1999
- National Action Plan for Salinity and Water Quality 2000
- National Objectives and Targets for Biodiversity Conservation 2001

- National Heritage Trust 2002
- National Reserve System Program & Interim Biogeographical Regionalisation of Australia
- Wetlands Policy of the Commonwealth Government of Australia
- Draft Conservation of Australian Species & Ecological Communities Threatened with Extinction
- Commonwealth Recovery Plans, Action Plans and Conservation Overviews
- National State of the Environment report

Commonwealth law

- Aboriginal and Torres Strait Islander Heritage Protection Act 1984
- Australian Heritage Commission Act 1975
- Australian Heritage Council Act 2003
- Environment Protection and Biodiversity Conservation Act 1999
- Fisheries Management Act 1991
- National Environment Protection Council Act 1994
- National Environment Protection Measures (Implementation) Act 1998
- Native Title Act 1993
- Natural Heritage Trust Act 1997
- Natural Resources Management (Financial Assistance) Act 1992
- Ozone Protection Act 1989
- Quarantine Act 1908
- State Grants (Nature Conservation) Act 1974

Appendix 3: Biodiversity and planning framework



STATE

State planning policies and strategies

- State Strategic Plan 2004
- No Species Loss – A Biodiversity Strategy for SA 2006
- Local Government Act 1999
- Animal and Plant Control Act 1983
- Water Resources Act 1997
- Environmental Protection Act 1993
- Native Vegetation Act 1991
- National Parks and Wildlife Act 1972

LOCAL

Council corporate documents

Open Space Strategy 1996
Enviroplan 1995
Community Land Management Plans 2004
Development Plan 1993
Possum Management Policy
Tree Management Strategy 2006
Significant Tree & Vegetation Study 1997
(Volume 3 Biodiversity Action Plan Council land)
Hills Face Reserves Management Plan 1994
Mt Osmond Reserves Action plan 1995

INDUSTRY

Codes of Practice

COMMUNITY ENVIRONMENT GROUPS

Landcare, Waterwatch, Organisations (e.g. NRM Groups, 'Friends of...' groups)

LANDHOLDERS

Appendix 4: Planting local species | Information for residents



Prior to European settlement, nearly 400 native plant species existed in the Burnside area. About 100 have survived in Burnside and most of these are threatened with local extinction.

You can help local nature conservation by using local species, propagated from local populations. If many people establish local flora in gardens, natural structure and connectivity will develop across the urbanised areas. This will attract more specialised bird and butterfly species which do not, at present, venture away from the hills face areas.

How to obtain local plants

Growing your own. Over the last few years, the Council has established areas of local native vegetation in reserves. These are all propagated from local natural populations. Residents are welcome to collect small amounts of seed from the plants in these areas to grow for their own properties.

Please do not dig up any plants. You can get assistance on seed collection and propagation from the Trees for Life organisation if you become a member. Contact at www.treesforlife.org.au See the City of Burnside web site <http://www.burnside.sa.gov.au/site/page.cfm?u=793> for native vegetation sites in Burnside.

If you want to establish local plants on the road verge adjacent to your property, Council will supply appropriate plants and advice for this.

Council plant distribution. Volunteers are growing plants at the Council nursery to give to residents. They are producing the top 15 most reliable species suitable for gardens in Burnside. They are chosen because they are

adaptable to a range of garden soils and are large enough to compete with garden weeds. If planted together on a weed free site with good weed follow-up, they will develop into a patch of native habitat.

Buying plants. There are no retail nurseries that supply local indigenous plants but there are a few specialised growers who propagate local plants and are careful to match the plants they sell to the places they are being planted. They propagate a wide range of local plants but usually they grow plants to order.

If you are buying local species it is important to ensure that they are propagated from local sources. This is to conserve our local genetic diversity.

For further information about Conservation and Land Management in Burnside, please look at the website, www.burnside.sa.gov.au

A good reference for local plants is "The Native Plants of Adelaide" by Phil Baghurst and Lynda Tout-Smith.

Top 15 most reliable basic local plants

The following are local species that will establish with little care in a wide range of garden situations. These are the ones that our volunteers are concentrating on growing for residents.

Drooping Sheoak

Allocasuarina verticillata

Form: Tree, to 8m tall, 4m wide

Notes: Small, shady, tree once prevalent on the plains and hills face, now locally rare and restricted to a few relict trees in the hills

face. Historically, it provided food for Glossy Black Cockatoos which is now restricted to Kangaroo Island. Efforts are being made to re-establish stands of Sheoak south of Adelaide in order to attract Glossy Black Cockatoos back to the mainland.

Golden Wattle

Acacia pycnantha

Form: Tree, to 6m tall, 3m wide

Notes: Small open tree with showy yellow flowers in late winter. Once very common but now very rare in Adelaide. Important habitat tree for birds and insects. It is Australia's floral emblem.

Slender Native Pine

Callitris gracilis

Form: Tree, to 8m tall, 3m wide

Notes: Small upright tree conifer. Once common but now very rare in Adelaide. Once an important source of quality timber.

Christmas Bush

Bursaria spinosa

Form: Shrub, to 3m. Generally upright in form

Notes: Showy flowers in early summer.

Hop Bush

Dodonaea viscosa

Form: Shrub to 3m

Notes: Attractive reddish seed pods in autumn

Hop Goodenia

Goodenia ovata

Form: Soft wooded shrub, to 1.5 m high.

Notes: Yellow flowers for a long period in spring and summer. Responds to being cut back in autumn. Likes moisture and some shade.

Appendix 4: Planting local species | Information for residents



Twiggy Daisy Bush

Olearia ramulosa

Form: Spreading shrub to 1.5m.

Notes: Dense, small-leaved shrub with small white flowers in autumn. Responds to pruning.

Berry Saltbush

Atriplex semibaccata

Form: Spreading groundcover.

Notes: Blue-grey leaves, small red berries. Covers the ground if weeds are well controlled.

Ruby Saltbush

Enchylaena tomentosa

Form: Low spreading shrub.

Notes: Blue-grey leaves, small red or yellow berries.

Clasping Goodenia

Goodenia amplexans

Form: Spreading, soft wooded shrub, to 1m high.

Notes: Yellow flowers for a long period in spring and summer. Responds to being cut back in autumn.

Native Hollyhock

Lavatera pleibeia

Form: Herbaceous plant to 1.5m

Notes: White flowers in spring and summer. Plants live only a few years but will self seed.

Scurf Pea

Cullen australasicum

Form: Herbaceous plant to 1.5m

Notes: Lilac flowers in spring and summer. Self-sows freely when weeds are controlled.

Native Buttercup

Ranunculus lappaceus

Form: Small wildflower with yellow flowers.

Notes: Needs weed free location and self-sows freely

Stiff Flat-sedge

Cyperus vaginatus

Form: Robust, tufty plant to 1.5m

Notes: Grows naturally by creeks and seasonally wet places. A local sedge.

Kangaroo Grass

Themeda triandra

Form: Tussock grass to 1m

Notes: Summer active. Likes a warm location.

Other species

There are other local species which will establish well in most gardens. Look them up in *Native Plants of Adelaide* and contact propagators of local plants to obtain them.

Small trees

Native Apricot (*Pittosporum phillyraeoides*)

Wirrilda (*Acacia retinodes*)

Shrubs

Wreath Wattle (*Acacia acinacea*)

Sticky Boobialla (*Myoporum viscosum*)

Climbers

Native Clematis (*Clematis microphylla*)

Native Lilac (*Hardenbergia violacea*)

Tufty Plants

Sedges (*Carex tereticaulis*, *Carex fascicularis*)

Flax Lily (*Dianella revoluta*)

Iron Grass (*Lomandra desiflora*, *Lomandra multiflora*)

Rush (*Juncus subsecundus*)

Grasses

Red-leg Grass (*Bothriochloa macra*)

Windmill Grass (*Chloris truncata*)

Wallaby Grass (*Danthonia fulva*)

Smaller plants

Bulbine Lily (*Bulbine bulbosa*)

Chocolate Lily (*Arthropodium strictum*)

Climbing Saltbush (*Einadia nutans*)

White Goodenia (*Goodenia albiflora*)

Native Lobelia (*Lobelia alata*)

Species for planting in wet places

Blackwood (*Acacia melanoxylon*)

Swamp Wattle (*Acacia provincialis*)

Carex appressa

Carex fascicularis

Carex tereticaulis

Cyperus vaginatus

Hop Goodenia (*Goodenia ovata*)

Native Rushes (*Juncus* sp.)

Native Lobelia (*Lobelia alata*)

Persicaria decipiens

Small-leaved Raspberry (*Rubus parvifolius*)

Tips for establishment

For average garden conditions, stick to the top 15 and large growing species. In these conditions the plants will survive but not reproduce.

For good habitat development, take the time to eliminate the weeds. This will allow the smaller native plants to sow themselves down and spread by themselves. Visit Linden Gardens opposite the Burnside Civic Centre to see this working in practice.

Appendix 5: Biodiversity site list



PROJECT SITES FOR THE CONSERVATION AND LAND MANAGEMENT TEAM

The symbols have the following meanings:

- R** remnant native flora present
- P** propagated local flora has been established at this site
- I** Site actively managed
- 2** Site maintained only, awaiting more resources or approval for improvement

URBAN SITES

Reserves

- A E Cousins Reserve – remnant site (RP1)
- A E Cousins Reserve - reveg site (P1)
- Auldana drainage Reserve (P1)
- Beaumont Common - part (RP1)
- Bellyett Reserve - creekzone (P1)
- Chapel Street Reserve (P1)
- Coach Road walkway (P1)
- Depot Swale (P1)
- Elizabeth Reserve (P1)
- Gilles Rd Reserve (P1)
- Glenside Stormwater Basin (P2)
- Hallett Road Trash Racks (P1)
- Hazelwood Park – spear grass patch in NE corner (RP2)
- Hazelwood Park Creek (P1)
- Heatherbank Reserve (R1)
- Holden Street carpark (R2)
- Hübbe Court Reserve Creek (P1)
- Ifould Reserve, below Ifould Drive, in conjunction with Parks & Gardens staff (P1)
- Kensington Gardens Reserve – area near tennis courts (P1)
- Kensington Gardens Reserve – Stonyfell Creek and Duck Pond (P1)
- Kensington Park Reserve – eastern indigenous area (R2)

- Linden Gardens (P1)
- Oval Terrace Reserve (P1)
- Pepper St Gallery – reveg site at rear (P1)
- Queens Avenue road reserve (R2)
- Romalo Reserve (RP2)
- Royal Avenue Drainage Reserve (P1)
- Simpson Reserve (P1)
- Slapes Gully Road Reserve (P1)
- Sydney Street Reserve (P1)
- Tusmore Park trashrack zone (P1)
- Wattle Park Reserve (R2)
- Young Park (R1)

Traffic management devices

- Clark St island (P1)
- Edinburgh Rd closure (P2)
- Greenhill – Hallett Rd island (RP2)
- Kurradjong – Grevillea island (P2)
- Oval Tce Island (P1)
- Sitters Memorial Drive road closure (P1)

Verges

- Coach-Knox planting (P2)
- 1 Rivington Grove (resident maintains) (P1)
- 318 Kensington Road, bus stop. (P1)
- 5 Sturt Place – Bothriochloa (R2)
- 8 Wynyard Grove, (resident maintains) (P2)
- 12 Wynyard Grove verge - Danthonia (R2)
- 1 Wallace – Chloris, Stipa etc (RP1)
- 364 Glynburn Road - Big Red (P1)
- 20 South Terrace. Adj Kesy Gdns Reserve, both sides of road, - Stipa (R2)
- Ifould Drive adj Ifould Reserve – Stipa, Enneapogon etc (R1)
- 482 Greenhill Rd – part (R2)
- 75 Sydney Street (P1)

- Heatherbank Terrace and top of Heatherbank Terrace (R1)
- Glenunga/Glen Osmond corner (P2)

NEAR URBAN BUSHLAND

- Langman Reserve (RP1)
- Magill Stone Mine Reserve (R1)
- Waterfall Gully Rd Walking Track (R1)
- Michael Perry Reserve – restoration area (R1)

HILLS FACE RESERVES AND ROADSIDES

- Themeda Reserve (RP1)
- Gully Reserve, including Wheel Gawler Mine Reserve (RP1)
- Zig-zag Reserve and Chimney Reserve (RP1)
- Danthonia Reserve (RP1)
- Gleeson Hill (RP2)
- Chambers Gully Reserve (RP1)
- Auldana South Reserves (RP1)
- Auldana North Reserves (RP2)
- Wyfield Reserve (RP1)
- Lavers Reserve (eastern portion) (R2)
- Waterfall Gully Reserve (RP1)
- Mount Osmond Road verge and Mt Osmond verges in general (R2)
- Mount Osmond Road – unmade section (RP2)
- Old Bullock Track (RP2)
- Eagle-on-the-Hill woodland (R2)
- Mt Osmond Road Landslip area (R2)
- Haven Road verge (R2)
- Knox Terrace verge (R2)
- Coach Road verge (R2)
- Dashwood Gully Reserve (P1)

Appendix 6: Operating guidelines



CONSERVE AND MANAGE REMNANT NATIVE VEGETATION—URBAN

Aim to conserve all remnant flora on the site, eradicate all weeds, foster natural regeneration and re-establish appropriate local flora.

Audit standards

- Native vegetation appropriately marked or protected
- Native flora not damaged by management operations
- Core areas weed free
- Core areas increased in area
- Major weeds controlled outside core area
- No weeds going to seed in core area. Weeds suppressed in non-core areas.
- Native grass areas to be cut after seeding with a clean brushcutter
- Pruning sufficient to keep tidy and free of dead twiggy material
- No rubbish present

CONSERVE AND MANAGE REMNANT NATIVE VEGETATION—HILLS FACE SITES

Aim to conserve all remnant flora on the site, eradicate major weeds, foster natural regeneration and re-establish appropriate local flora.

Audit standards

- Native vegetation appropriately marked or protected in contractor managed areas.
- Native flora not reduced by management operations.
- Core areas free of major weeds
- Core areas increased in area according to agreed yearly targets

- No major weeds going to seed
- Follow-up complete on all primary cleared areas
- No Monadenia, Bridal Creeper or Pentaschistis going to seed anywhere in Burnside
- No planting where future weed control will be made more difficult
- Planted species appropriate to site
- Plants at or slightly below ground level
- Plants well firmed in with no air pockets
- Weeds around plantings cut or sprayed, no indigenous flora damaged
- Plantings in fire prevention buffer area approved by fire prevention officer

ESTABLISH AND MAINTAIN INDIGENOUS VEGETATION AT APPROPRIATE URBAN SITES

Aim to reintroduce indigenous flora as appropriate to urban sites, including a diversity of ground flora appropriate to the size and usage of the site.

Audit standards

- Site appropriately marked or protected
- No weeds in groundflora sites either ready for planting or established
- Natural regeneration protected
- Adequate provision for paths, seats & open grass areas (maintain feel of park)
- Plants planted at or only slightly below ground level
- Plants firmed and watered in with well broken up soil to ensure no air pockets
- Plants planted in sufficient numbers to form a founding population rather than as single specimens.
- All planting recorded
- No new plantings dying of drought

COLLECT SEED AND CUTTING MATERIAL

Aim to collect adequate seeds and cuttings to meet propagation targets and maintain a small seed bank. It is anticipated that an adequate bank of many species will be collected opportunistically during normal activities during the year. Collection of bulk grass and some other species will require time to be set aside.

Audit standards

- No visible damage to source plants
- Seeds collected from as many plants as possible
- Seeds dry and labelled with species, location, number of parent plants
- Seed storage cupboard dry and clean and not accessible to vermin
- Bulk seed in bins with lids
- Naphthalene flakes used to deter insects
- Bulk grass stored dry and off the floor, stored for less than 9 months

RESCUE LOCAL FLORA FROM DEVELOPMENT SITES

Aim to rescue and pot up as large a species range and quantity of indigenous flora as appropriate from any site where indigenous flora is to be destroyed for development.

Audit standards

- Rare, slow growing and hard to grow species maximised
- Tops cut back to match root loss
- Plants kept moist during transplanting
- Plants kept in shade after transplanting
- Transfer of weeds minimised and weeded afterwards
- Rescue sites left in a tidy state

Appendix 6: Operating guidelines



- Plants with transferred weeds placed in isolated location in nursery
- Plants labelled with provenance, rescue symbol and date.

PROPAGATE LOCAL FLORA

Aim to produce all indigenous plant requirements for the Conservation and Land Management program and parks plantings and to establish all possible Burnside flora species in reserves.

Audit standards

- Propagation targets met, provided orders received by end of November
- Plants maintained in good condition
- Plants labelled with species, provenance, sowing and transplanting dates
- 5 new species added to propagation list each year.

MANAGE THE NURSERY AND STORE

Aims: To maintain the nursery facility in a condition suitable for the safe and efficient production of quality and weed free plant stock.

To keep the store areas in a tidy condition suitable for efficient and safe storage of materials and equipment.

Audit standards

- Nursery floor (ground) kept weed free with regenerating native flora retained where practicable
- Stock kept weed free, native colonisers suppressed but not eradicated.
- Plants grown from as wide a range of seed sources as possible
- Each box or tray with at least 2 labels

- Each pot labelled
- Label to include species, provenance, sowing time, potting on time etc
- Plants properly watered
- Dead plants disposed of safely
- Dirty tubes and containers washed and stored

- Snail bait not accessible by birds
- Small plants and germinating seeds protected from birds and possums
- Advanced stock in appropriate sized containers
- Nursery sheds and office maintained in safe and tidy condition
- Tools washed and put away at the end of each day
- Floor swept after a work session
- Herbicide stored in locked cupboard
- Seeds dry, pest free and labelled

DEVELOP AND MAINTAIN THE WALKING TRAIL NETWORK

Aim to maintain all walking trails in a safe and sustainable condition

Audit standards

- Slope to side of path maintained
- Weeds slashed to a minimum distance of 1m on each side of track
- Major weeds sprayed
- Weeds no higher than 150mm
- Native vegetation not damaged (grasses can be cut)
- Overgrowing native trees and shrubs pruned to height of 2.5m
- Rock falls and slumping removed and repaired
- Cross-track fall maintained
- Width of track maintained

MAINTAIN, PROTECT AND REPAIR MINOR INFRASTRUCTURE

Aim to apply appropriate technical solutions to the protection of land and infrastructure at biodiversity sites

Audit standards

- Logs pegged for path definition and site protection
- 75 -150mm diameter pegs not proud of log
- Minor erosion reported and remedial action taken if appropriate
- Protective fencing with strainer struts at ends and corners, with plastic caps on top of droppers pulled tight
- Signs
 - free of graffiti
 - appropriate to purpose
- Seats (if available) placed well with respect to sun, shade and view.

LIAISE WITH OTHER COUNCIL STAFF AND CONTRACTORS

Aim to assist other staff and contractors apply biodiversity principles to their work

Audit standards

- Plants supplied to Parks team
- Advice given to Parks Team on species selection, planting and management
- Significant flora marked in Parks sites
- Protected plants marked with blue paint, pegs or tape as appropriate prior to work by contractor
- Contractors clear about responsibility for protected plants

Appendix 6: Operating guidelines



LIAISE WITH VOLUNTEERS

Aim to ensure that volunteers feel supported and empowered to do useful work of high quality

Audit standards

- Volunteers properly inducted and clear about their work plan
- Volunteers contacted at least once per quarter
- Work by volunteers meets audit standards

ATTEND TO CUSTOMER REQUESTS WHICH RELATE TO BIODIVERSITY SITES

Aim to attend to customer requests in a manner consistent with Burnside Customer Service standards. Customers include residents, volunteers, other council staff and anyone with a valid interest in Burnside natural areas.

Audit standards

- City of Burnside standards apply

KEEP RECORDS

Aim to maintain records of activities in an accessible form

Audit standards

- Log kept of all propagation activities at nursery
- Planting records by site
- Photographs – major sites 6-monthly, minor sites yearly, ad-hoc photographs of work in progress, incidents etc
- Herbicide use records – chemical used, location, amount, result
- Diary entries of activities entered daily
- Site species lists with records of regeneration

Appendix 7: Biodiversity policies



SUSTAINABILITY

Burnside Council acknowledges that local actions impact globally and it is our policy to protect and enhance natural resources and to provide a safe, secure and healthy environment for present and future generations.

Specifically:

- by ensuring that environmental considerations are integral to Council's everyday decision making and operations;
- by promoting environmental awareness amongst staff and residents;
- by providing the utmost support in the establishment of partnerships for ecologically sustainable practices amongst the community; and
- by leading by example in the uptake of sustainability initiatives.

BIODIVERSITY POLICY COUNCIL OPERATIONS

Council will adopt a range of principles and practices that ensure a measured process of conservation, reclamation and enhancement of biodiversity on Council managed land.

- Council will minimise adverse impacts on significant indigenous vegetation and local biodiversity from Council operations, specifically:
- the construction of footpaths;
 - herbicide and pesticide applications;
 - bushfire prevention works;
 - the laying and maintenance of services particularly stormwater infrastructure and roads; and
 - the development of public facilities.
- Council will control the spread of pest plant and feral animal species.

- Council will restore areas of high biodiversity significance by revegetating with local provenance plants grown from seed collected locally.
- Council will promote an understanding of the importance of biodiversity and ecological awareness in Council, the community and outside agencies.
- Council will work to restore habitats and create an integrated network of ecosystems for the protection of indigenous flora and fauna.
- Council will assess and monitor the impact of Council works on significant trees, remnant indigenous vegetation and surrounding soil.
- Council's practices, procedures and policies will comply with the requirements of relevant legislation and strategies aimed at preserving and enhancing biodiversity.

COUNCIL AND COMMUNITY IN PARTNERSHIP

Council will establish partnerships with owners, developers and other agencies to ensure a measured process of conservation, reclamation and enhancement and the minimisation of threats to biodiversity on privately owned land.

- Council will minimise the impact upon significant vegetation and local biological diversity from private development through the Development Assessment process:
 - to minimise the impact of the construction of buildings, particularly dwellings, fences and out buildings
 - to minimise the loss of significant and/or mature indigenous vegetation (specifically trees)

- to encourage the capture and rescue of significant understorey plants to designated sites; and
- where removal is approved, to encourage the replacement of indigenous trees and vegetation with trees and vegetation grown from local provenance species.
- Council will minimise the impact upon significant vegetation and local biodiversity on private property through the provision of community information and education programs.
- Council will minimise the impact upon significant vegetation and local biodiversity on private property through lobbying other government agencies.
- Council will enter into agreements with local landowners to control the spread of pest plant and feral animal species and preserve the local biodiversity on private land.

TROPICAL RAINFOREST TIMBER

It shall be the policy of Council not to purchase timber originating from tropical rainforests or Australian sourced timber from any area other than commercially grown plantations except in specific circumstances where it is not practical to adhere to policy.

PROTECTION OF NESTING HOLLOWS

When considering tree removal the following guidelines apply:

- Recognition that trees provide the habitat for bird life is acknowledged and is included in the criteria to be evaluated when considering removal.

Appendix 7: Biodiversity policies



- Where public safety is not compromised dead trees (hardwood) in Parks may be retained.
- Where public safety and the health and appearance of a tree is not compromised dead hollow branches may be retained in park or street trees.
- Where possible, tree removal should be undertaken between March and June so there will not be interference with the nesting process.
- Prior to any tree removal and particularly between July and February, the tree is to be examined and if active nesting is in progress, the tree will not be removed until the birds have flown, unless:
 - A public danger exists
 - Removal is resolved by Council.
- In this case, the birds/nest are to be relocated to the Bird Care & Conservation Society Inc.

VEGETATION PROTECTION POLICY

- That prior to works involving pruning of soil disturbance on foothill roads outside suburban areas there be inspection by a botanist or other suitable person to identify significant flora and advise upon a strategy for conservation and protection of any indigenous plant.
- That no planting in Council Reserves should compromise the conservation of existing indigenous vegetation:
 - Where species are to be planted in areas where they occur naturally they must be propagated from local seed sources.
 - Where native grasses or other understorey plants occur naturally they should be preserved.
 - No native grasses other than from local seed sources should be planted in any reserves.
 - Parks, reserves and watercourse lines should be assessed for native vegetation, eg The Common, Hazelwood Park.

EUROPEAN WASPS

The following policy applies:

- Council will supply information on wasps to residents.
- Eradicate wasps on Council property.
- Advise owners of property whose nests have been located to have nests eradicated by a licensed pest controller with costs met by Council.

BRUSH FENCES

Burnside Council discourages the use of brush fences unless the material is provided from plantation growth.

MOSS ROCKS

Burnside Council discourages the use of moss rocks in landscape planning.

Appendix 8: The Bradley method



Native flora work in Burnside follows the general principles of the Bradley Method developed by Joan and Eileen Bradley in Sydney in the 1960's.

The Bradley sisters proposed 3 Principles of Bush Regeneration:

1. Always work from areas with good native plants towards weed-infested areas. Areas of low weed infestation are easy to maintain in good condition and areas adjacent to these areas have a larger native seed bank and regenerate more successfully.
2. Create minimal disturbance. Weeds are encouraged by disturbance of the ground layer.
3. Let the rate of regeneration of native plants determine the rate of weed removal. Too rapid clearing will lead to massive germination of weeds, and time has to be spent in re-weeding the site to give regenerating natives a chance.

The first principle requires some knowledge of botany. It is essential to know the local flora well enough to distinguish a weed from a native species.

Without this knowledge, it is not possible to determine which are good or bad areas or to estimate the chances of regeneration.

The second principle recognises the fact that disturbed ground favours the growth of weeds. All work in native vegetation will create some disturbance, but it must be minimal.

The third principle recognises that as the primary clearing moves into the thicker weeds, the rate of regeneration slows down, so the rate of clearing must be reduced to match.

The Bradley method is a philosophy which requires the native vegetation practitioner to do all things necessary to encourage the existing indigenous species to spread and to provide favourable conditions for the germination of native seed. The aim is to grow resilient native vegetation. Bush regeneration is not a recipe for instant bush. It is a systematic way to gradually restore and maintain a native plant community.

The Bradley Method was developed to cope with weed incursions into good quality native vegetation. In Burnside most of the sites are very degraded with many different weed species growing in soils of high nutrient status and only scattered indigenous plants remaining. We also have other site objectives that need to be satisfied such as fire hazard reduction, appealing to an urban aesthetic sensibility and preservation of views.

The native vegetation work standards developed in Burnside presented in Appendix 6 are based on applying the Bradley Method to high quality sites and protecting all remnant native plants during revegetation.

References and bibliography



- Australian Local Government Association 1998, National Local Government Biodiversity Strategy.
- Australian National University, *The University's environmental management program*, viewed 9 November 2007, <www.anu.edu.au/anugreen>.
- Bradley, J 2002, *Bringing back the bush: the Bradley method of bush regeneration*, New Holland, Frenchs Forest, New South Wales..
- BioCity 2007, *BioCity: Centre for urban habitats*, viewed 9 November 2007, <www.biocity.edu.au>.
- Canfield, PJ, Hartley, WJ & Dubey, JP 1990, 'Lesions of toxoplasmosis in Australian marsupials', *Journal of Comparative Pathology*, vol. 103, pp. 159–167.
- City of Burnside 1997, Biodiversity action plan for council land.
———2006, The strategic plan for the Burnside community: vision 2020.
——— 2006, Tree management strategy.
- City of Newcastle 2005, Newcastle Biodiversity Strategy.
- Cogger, HG 1996, *Reptiles and amphibians of Australia*, 5th edn, Reed, Port Melbourne.
- Collier, N, Mackay, DA, Benkendorff, K, Austin, AD, & Carthew, SM 2006, 'Butterfly communities in South Australian urban reserves: Estimating abundance and diversity using the Pollard walk', *Austral Ecology*, vol. 31, pp. 282–290.
- Department of Foreign Affairs and Trade 1993, *Convention on Biological Diversity*, United Nations Conference on Environment and Development, Australian Treaty Series, no. 32, viewed 9 November 2007, <www.austlii.edu.au/au/other/dfat/treaties/1993/32.html>.
- Department of the Environment and Water Resources, *The Biodiversity Toolbox*, viewed 9 November 2007, <www.environment.gov.au/biodiversity/toolbox/index.html>.
- Grund, R 2004, *South Australian Butterflies*, viewed 9 November 2007, <www.users.sa.chariot.net.au/~rgrund/checklist.htm>.
- Kraehenbuehl, D 1996, *Pre-European Vegetation of Adelaide : a survey from the Gawler River to Hallett Cove*, Nature Conservation Society of South Australia Inc., Adelaide.
- London Borough of Ealing, Biodiversity Action Plan, viewed 9 November 2007, <www.ealing.gov.uk/ealing3/export/sites/ealingweb/services/leisure/parks_and_open_spaces/_parks_docs/bap.pdf>.
- National Parks and Wildlife Service (NSW) 2006, Predation by the European red fox—key threatening process listing, viewed 9 November 2007, <www.nationalparks.nsw.gov.au/npws.nsf/>.
- Paton, DC 1990, 'Domestic cats and wildlife', *Bird Observer*, vol. 696, pp. 34–35.
——— 1991, 'Loss of wildlife to domestic cats', in C Potter (ed.), *The impact of cats on native wildlife: proceedings of a workshop 8–9 May 1991*, Australian National Parks & Wildlife Service, Endangered Species Unit, Canberra, pp. 64–69.
- Regional Strategy Group 2000, Strategic guide to Natural Resource Management in South East Queensland, Regional Strategy Group, Queensland.
- San Francisco Recreation and Parks 2006, *Significant Natural Resource Areas Management Plan*, viewed 9 November 2007, <www.parks.sfgov.org/site/recpark_index.asp?id=32662>.
- Saunders, DA, Hobbs, RJ, & Margules, CR 1991, 'Biological consequences of ecosystem fragmentation: A review', *Conservation Biology*, vol. 5, pp. 18–32.
- Smith, P, Pate, FD & Martin, R (eds) 2006, *Valleys of Stone: the archeology and history of Adelaide's hills face*, Kopi Books, Belair, Adelaide.
- State of the Environment Advisory Council 1996, *Australia State of the Environment 1996*, viewed 9 November 2007, <www.environment.gov.au/soe/soe96/index.html>.
- Turner, MS 2001, *Conserving Adelaide's biodiversity: resources*, Department for Environment and Heritage, SA Urban Forest Biodiversity Program, Adelaide.
- Warburton, E 1981, *The paddocks beneath: a history of Burnside from the beginning*, Corporation of the City of Burnside, Adelaide.
- Wilson, S, & Swan, G 2003, *A complete guide to reptiles of Australia*, Reed New Holland, Sydney, Australia.
- Young, K, Daniels, CB, Johnston, G 2007, 'Species of street tree is important for southern hemisphere bird trophic guilds', *Austral Ecology*, vol. 32, no. 5, pp. 541–550.



City of Burnside

401 Greenhill Road

Tusmore SA 5065

Telephone (08) 8366 4200

Facsimile (08) 8366 4299

www.burnside.sa.gov.au