

Brownhill Creek Recreation Park Management Plan

Mount Lofty Ranges

June 2003



Government
of South Australia

DEPARTMENT FOR

environment
and heritage

Our Parks, Our Heritage, Our Legacy

Cultural richness and diversity are the marks of a great society. It is these qualities that are basic to our humanity. They are the foundation of our value systems and drive our quest for purpose and contentment.

Cultural richness embodies morality, spiritual well-being, the rule of law, reverence for life, human achievement, creativity and talent, options for choice, a sense of belonging, personal worth and an acceptance of responsibility for the future.

Biological richness and diversity are, in turn, important to cultural richness and communities of people. When a community ceases to value and protect its natural landscapes, it erodes the richness and wholeness of its cultural foundation.

In South Australia, we are privileged to have a network of parks, reserves and protected areas that continue to serve as benchmarks against which we can measure progress and change brought about by our society. They are storehouses of nature's rich diversity, standing as precious biological and cultural treasures. It is important to realise that survival of species in 'island' reserves surrounded by agriculture or urban areas is uncertain, and that habitat links between reserves are essential for their long-term value as storehouses.

As a result of more than a century of conserving nature and cultural items, we possess a "legacy" which is worth passing on to future generations.

There are twelve essentials for the protection of our park environments:

- Recognition that a primary purpose of our national parks system is to conserve the wide diversity of South Australia's native plants and animals and to improve their chances of survival through active wildlife management.
- Recognition that all our parks also protect cultural legacy of relevance to both Indigenous and Non-Indigenous people, and that Indigenous people have had cultural association with this land over many thousands of years.
- Freedom to improve our legacy by making additions to the park system -- enhancing existing protected areas and including landscapes and environments containing native plant and animal communities not already protected.
- Realisation that the continuance of our native species cannot be dependent upon island reserves alone but should be provided for in a regional landscape with linkages between natural areas to enhance the prospect of long-term survival.
- Recognition that there is potential for new and useful substances or genetic material to be found in native plant and animals.
- Recognition of economic and social benefits for local communities, which arise from the presence of national parks in their region and the consequent opportunities to offer service for visitors.
- Development of close relationships with the community, so that there is an understanding of the role of parks in conserving native wildlife, cultural items and in providing recreational opportunities.
- Promotion of community participation in making decisions on the management of parks, so that a sense of community ownership of the reserve system may be fostered, and so that parks and surrounding landscapes are managed in harmony.
- Appreciation that those qualities presented to visitors for their use and enjoyment in parks, should be the diversity of plants, animals and landscapes for which the parks were set aside.
- Understanding that development in a park should proceed where it :
 - contributes to the conservation of the environment;
 - provides for better appreciation of the need to conserve the diversity of plants and animals;
 - protects wildlife habitats and landscape (especially Vulnerable and threatened species or communities); and
 - is necessary for management of the park.
- Reassurance, in support of our cultural character, that natural areas can survive even though those who care deeply for their survival may never visit them.
- Provision of valued natural areas for people to be at one with nature and for personal and spiritual refreshment.

BROWNHILL CREEK RECREATION PARK MANAGEMENT PLAN

Mount Lofty Ranges

South Australia

June 2003

Department for Environment and Heritage

This plan of management has been prepared and adopted in pursuance of Section 38 of the *National Parks and Wildlife Act 1972*.



Government of South Australia

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FOREWORD

Brownhill Creek Recreation Park has long been cherished by South Australian's and as one of our States oldest park's, it is rich with cultural heritage.

Located in the foothills of the Mount Lofty Ranges and on the doorstep of the urban environment, Brownhill Creek offers a valuable recreation resource for many local residents and visitors, providing opportunities for bushwalking, picnicking and camping.

The park is renowned for its extensive cultural heritage and visitors can enjoy exploring the many relics of the park, including the 'Monarch of the Glen', an estimated 300 year old River Red Gum, significant to the Kaurna Aboriginal people and used as a make shift home by many colonial settlers.

The park is also famous for the State Heritage Registered manure pits, built in 1891 to prevent pollution of the creek when the valley was used for market gardening.

Management intends to balance recreation and tourism with biodiversity conservation and the preservation and restoration of cultural heritage sites. The management objectives for Brownhill Creek Recreation Park have not been prepared in isolation, but rather in consultation with other agencies and community groups.

The plan of management for Brownhill Creek Recreation Park is now formally adopted under the provisions of section 38 of the *National Parks and Wildlife Act, 1972*.



JOHN HILL

MINISTER FOR ENVIRONMENT AND CONSERVATION



SYNOPSIS

This is the management plan for Brownhill Creek Recreation Park, one of Adelaide's oldest parks, located in the foothills of the Mount Lofty Ranges and officially set aside as a reserve for recreation purposes in 1858. The 51 ha park was first dedicated a National Pleasure Resort in 1915 and later proclaimed a Recreation Park under the *National Parks and Wildlife Act 1972* to conserve remnant river red gums and riparian zone habitat. The park contains 27 plant species of conservation significance, including 5 at State level and provides habitats for resident fauna species, including possums, bats and kookaburras.

In addition to important natural resources, Brownhill Creek has extensive cultural heritage, including Aboriginal cultural heritage sites and sites remaining from its mining and market gardening past.

The park attracts approximately 30–40,000 visitors each year with recreation opportunities including walking trails, picnic areas, horse-riding, historic sites and a caravan park with refreshment facilities.

Identified threatening processes include extensive weed infestations throughout the creek and ongoing pressure on soil and vegetation from visitors and vehicles. The park's historic relics are also in need of restoration and protection.

To achieve the major objectives within the plan the following key actions are recommended:

- Identify existing areas of erosion and undertake remedial work that includes natural regeneration, revegetation and pest plant removal, in accordance with the *Brownhill Creek Recreation Park Vegetation Management Plan* (Kinnear *et al* 2001); and
- Restore and protect known or newly discovered cultural and historic sites, using appropriate measures, and monitor site condition.
- Opportunities exist to create partnerships between State and Local Government and the community in the management of the reserve.
- Investigate the suitability of including land in allotment 83 in the hundred of Adelaide, once intended for inclusion in the Brownhill Creek National Pleasure Resort, but omitted from Brownhill Creek Recreation Park.

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ABBREVIATIONS AND GLOSSARY OF TERMS

ALRM:	Aboriginal Legal Rights Movement
DEH:	The Department for Environment and Heritage
DEHAA:	The (former) Department for Environment, Heritage and Aboriginal Affairs
DENR:	The (former) Department of Environment and Natural Resources
DAARE:	The Department for Aboriginal Affairs and Reconciliation
GIS:	Geographic Information System
IBRA:	Interim Biogeographic Regionalisation for Australia
IUCN:	The International Union for Conservation of Nature and Natural Resources (The World Conservation Union)
PCWMB:	Patawalonga Catchment Water Management Board

ACKNOWLEDGEMENTS

This plan of management was compiled by staff of the Adelaide Region and the Reserve Planning Unit, Department for Environment and Heritage. Valuable assistance received at various times from other groups and individuals who provided information or comments is also acknowledged, including the Friends of Brownhill Creek, Brownhill Creek Association, City of Mitcham, Maggie Raggless from the Mitcham Heritage Research Centre and the Patawalonga Catchment Water Management Board.

1 INTRODUCTION

This management plan has been prepared in accordance with the *National Parks and Wildlife Act 1972*.

Section 38 of the Act states that a management plan is required for each reserve. A management plan should set forth proposals in relation to the management and improvement of the reserve and the methods by which it is intended to accomplish the objectives of the Act in relation to that reserve.

Upon completion of a draft plan an announcement is made in the Government *Gazette* and the plan is placed on public exhibition for three months. During this period, any interested person may make submissions which are then referred, with the plan, to the South Australian National Parks and Wildlife Council for their comments and suggestions. Submissions must be in writing; e-mail submissions are acceptable.

Having formal community input into public land management is a requirement of the legislation and supported by park managers. The draft plan for Brownhill Creek Recreation Park was released for public exhibition in January 2002. At the close of the comment period, 132 submissions had been received.

Issues raised in submissions included concerns regarding road safety and maintenance, support for the addition of Allotment 83 which adjoins the park, corrections/addenda to species lists, historical and cultural content, both concerns and support for the development of a multi-use trail and the appropriateness of the horse arena. All these concerns were considered by the Sturt Consultative Committee before going to the SA National Parks and Wildlife Council.

The Minister, after considering all representations, may then adopt the management plan with or without alterations. In the case of the plan for Brownhill Creek Recreation Park, a number of alterations have been incorporated as a result of the community consultation process. Notice of official adoption is published in the Government *Gazette* and copies of the final plan are made available for sale to the public. They may also be viewed on the departmental website http://www.environment.sa.gov.au/parks/management_plans.html.

Once a plan of management is adopted, its provisions must be carried out in relation to the reserve in question and no actions undertaken unless they are in accordance with the plan. However, the Act does make provision for amending adopted plans and this process is similar to the one described above.

This document is the adopted management plan for Brownhill Creek Recreation Park. The reserve is located on the foothills of the Mount Lofty Ranges, which falls within the Adelaide Region of the Department for Environment and Heritage. The plan outlines proposals to effectively conserve the natural and cultural values of the parks, while providing for public use and enjoyment.

2 MANAGEMENT FRAMEWORK

Management planning is a statutory requirement for all reserves prescribed in S38 of the *National Parks and Wildlife Act 1972* and S31 of the *Wilderness Protection Act 1992*. The management planning process is but a small part of a much larger, state-wide hierarchy of management. This is directed from the highest level by state government policies and departmental priorities and implemented, on a day to day basis, at a regional and district level.

Management plans provide a ministerially endorsed and legally binding framework for the use and management of *National Parks and Wildlife Act* reserves. They are intended to accommodate anticipated trends and community aspirations over a five to ten year time frame. The legislation anticipates that management plans will be formally reviewed from time to time, but there are no prescribed time limits for this to occur.

DEH regional staff have been assigned primary responsibility for preparing management plans and undertaking the associated community consultation process. A standard management planning process is mandated, to ensure that all statutory obligations are met.

Management plans define what is considered acceptable activity in a reserve while still allowing park managers some flexibility in day to day decision-making. They should be proscriptive enough to prevent deleterious activities, or inappropriate developments, taking place. They are not intended to be comprehensive compendiums of resource information, nor are they heavily prescriptive action statements; other documentation covers those aspects. They do however, identify the key values of reserves, the appropriate utilisation and the major issues of concern requiring action, thereby providing the community (and park managers) with a blue-print of how public land is going to be used and managed.

Management plans often foreshadow the preparation of 'delegate' plans to achieve the proposed objectives. Delegate plans are detailed, non-statutory action plans that provide additional details on how the actions, listed in the management plan, are to be progressed. With regard to Brownhill Creek Recreation Park, a Vegetation Management Plan had been produced and the development of a Horse Riding Code of Practice and a Trail Plan are proposed. Although such in-house action plans are not subject to the same statutory processes as are formal management plans, DEH will continue to involve relevant stakeholders, other agencies and community groups in their preparation and implementation as part of the on-going management of the park.

Each year park managers, taking regional and district priorities into account, draw up work programs to implement some of the actions proposed in management plans. Whether these projects are actually undertaken is determined by, and subject to, the availability of resources (eg staffing and funding) and to any requirements of the Minister for Environment and Conservation and the department's Chief Executive, who take a state-wide overview in setting departmental priorities and allocating resources.

2.1 Park Classification

Parks are established for the conservation of biodiversity and cultural heritage and the environmentally responsible use of our natural resources. The classification of parks provides a general statement of purpose for which the area was acquired.

Classifications under the *National Parks and Wildlife Act 1972*, the *Crown Lands Act 1929* or the *Wilderness Protection Act 1992* are as follows:

Recreation Parks (RP) - areas of significance under the *National Parks and Wildlife Act*, managed for public recreation and enjoyment in a natural setting;

National Parks (NP) - areas proclaimed under the *National Parks and Wildlife Act* considered to be of national significance due to wildlife, natural features of the land or cultural heritage;

Conservation Parks (CP) - areas under the *National Parks and Wildlife Act* that are protected for the purpose of conserving wildlife or the natural or historic features of the land, where the development of visitor facilities tends to be kept to a minimum;

Game Reserves (GR) - areas set aside under the *National Parks and Wildlife Act* for the conservation of wildlife and the management of game at prescribed times for controlled seasonal hunting;

Regional Reserves (RR) - areas proclaimed under the *National Parks and Wildlife Act* for the purpose of conserving wildlife or natural or historical features while allowing responsible use of the area's natural resources (ie. mining);

Conservation Reserves (CR) - land currently set aside for conservation of natural and cultural features under the *Crown Lands Act 1929* and held under the care, control and management of the Minister for Environment, that for various reasons were not proclaimed under the *National Parks and Wildlife Act, 1972*;

Wilderness Protection Areas (WPA) - land set aside under the *Wilderness Protection Act 1992* to protect natural and remote areas.

2.2 Government Policy and Legislation

When managing reserves, DEH is required under section 37 of the *National Parks and Wildlife Act* to have regard to, and provide actions that are consistent with the following objectives stated in the Act:

- preservation and management of wildlife;
- preservation of historic sites, objects and structures of historic or scientific interest within reserves;
- preservation of features of geological, natural or scenic interest;
- destruction of dangerous weeds and the eradication or control of noxious weeds and exotic plants;
- control of vermin and exotic animals;
- control and eradication of disease of animals and vegetation;
- prevention and suppression of bush fires and other hazards;
- encouragement of public use and enjoyment of reserves and education in, and a proper understanding and recognition of, their purpose and significance; and
- generally, the promotion of the public interest.

Additional legislation, conventions and agreements, DEH is obliged to comply with are listed in Appendix A.

2.3 Native Title

“Native Title” is used to describe the interests Aboriginal and Torres Strait Islander People have in land and waters according to their traditional laws and customs. Federal legislation, the *Native Title Act 1993*, was enacted to:

- provide for the recognition and protection of native title;
- establish ways in which future dealings affecting native title may proceed and to set standards for those dealings;
- establish a mechanism for determining claims to native title; and
- provide for, or permit, the validation of past acts, and intermediate period acts, invalidated because of the existence of native title.

Any development proposed for a reserve must be valid in terms of the *Native Title Act 1993*.

This reserve is subject to a claim for a determination of native title by the Kurna People. A ‘determination’ is a decision made by the courts as to who holds native title for an area.

This management plan is released and will be adopted subject to any native title rights and interests that may continue in relation to the land and/or waters. Nothing in the management plan is intended to affect native title. Before undertaking any future acts that might affect native title, DEH will follow the relevant provisions of the *Native Title Act 1993*.

However, in addition to the requirements of native title legislation, DEH is committed to developing partnerships with Aboriginal people. This may include a number of native title and Aboriginal heritage groups.

Consistent with South Australian Government policy, DEH is also keen to pursue Indigenous Land Use Agreements (ILUAs) where appropriate. ILUAs are voluntary agreements between a native title group and other people about the use and management of land and/or waters.

2.4 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) represents a fundamental reform of former Commonwealth environment laws. The Act establishes a new Commonwealth approval process for assessment of proposed actions that are likely to have a significant impact on matters of national environmental significance and provides an integrated system for biodiversity conservation and management of important protected areas.

Matters that require assessment and approval of proposed actions under the EPBC Act 1999 are:

- any action that has, will have or is likely to have a significant impact on the following identified matters of national environmental significance:
 - World Heritage properties
 - Ramsar wetlands of international significance
 - Nationally listed threatened species and ecological communities
 - Listed migratory species
 - Commonwealth marine areas
 - Nuclear actions (including uranium mining)
- any activity involving Commonwealth land that has, will have, or is likely to have a significant impact on the environment.

With regard to Brownhill Creek Recreation Park, the Southern Brown Bandicoot (*Isoodon obesulus*), is the only currently listed nationally threatened species that occurs in the park. Commonwealth approval is required for any action that has, will have or is likely to have a significant impact on this nationally threatened species in addition to any State approval that may be required.

Furthermore, in consultation with relevant State authorities, the Commonwealth Minister for the Environment and Heritage may develop and implement recovery plans and threat abatement plans for threatened species and ecological communities listed under the EPBC Act. Where applicable, DEH should contribute to and incorporate these plans into park management regimes and operational procedures.

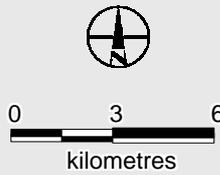
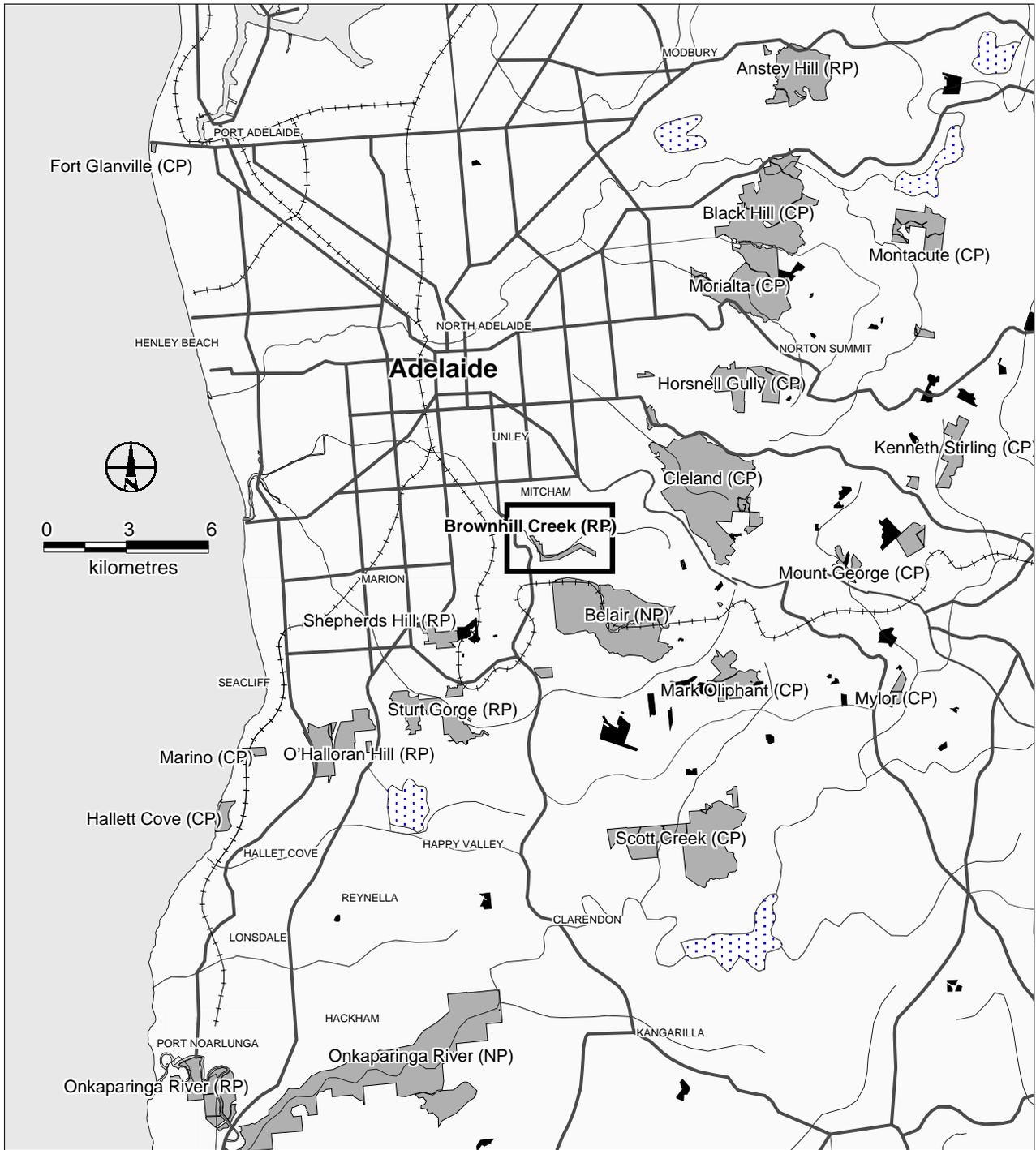


Figure 1
Brownhill Creek Recreation Park

Location

Map designed and created by
Reserve Planning using PAMS
Date: June 2003

LEGEND

-  Road
-  Railway
-  Hydrology
-  NPWSA Reserve
-  Heritage Agreement



3 MANAGEMENT CONTEXT

3.1 Purpose of Reserve

According to historic accounts at the Mitcham Heritage Research Centre, Brownhill Creek Reserve was originally set aside in 1841 for “public purposes”, until 1915 when the reserve was officially dedicated a National Pleasure Resort (see 3.4 History of Reserve Management).

In 1972, Brownhill Creek was proclaimed a Recreation Park under *the National Parks and Wildlife Act* in order to provide recreation opportunities for the Adelaide and eastern metropolitan region and to conserve remnant aged river red gums and the riparian zone habitat.

IUCN Classification

Brownhill Creek Recreation Park is classified as a Natural Monument (IUCN category III), which is described as an area containing one, or more, specific natural or natural/cultural features of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance. Management of Brownhill Creek Recreation Park will be consistent with the following IUCN Category III management objectives;

- To protect or preserve in perpetuity specific outstanding natural features because of their natural significance, unique or representational quality, and/or spiritual connotations.
- To an extent consistent with the foregoing objective, to provide opportunities for research, education, interpretation and public appreciation.
- To eliminate and thereafter prevent exploitation or occupation inimical to the purpose of designation.
- To deliver to any resident population such benefits as are consistent with the other objectives of management.

3.2 Location and General Description

Brownhill Creek Recreation Park is located in the foothills of the Mount Lofty Ranges, 8 kilometres south of Adelaide in the City of Mitcham (Figure 1). The 51 ha park is linear in shape with an average width of 200m and follows the creek for approximately 4 kilometres.

Brownhill Creek is recognised as one of Adelaide’s oldest parks, containing important historic sites that remain from early human occupation. Sites include an old River Red Gum known as the Monarch of the Glen (used by Kurna Aboriginal people for shelter), Viney’s bluestone quarry and the State Heritage Registered manure pits (Figure 2).

Brownhill Creek or ‘Wirraparinga’, as it was known to the Kurna Aboriginal people, was an important camping and hunting ground (Tindale 1974). Some of the Kurna Aboriginal language and traditional stories have been recorded, but the full extent of their heritage in Brownhill Creek is largely unknown to Government.

Today, the park provides recreation opportunities popular with nearby residents and other visitors. It contains walking trails, a picnic ground, a caravan park with campsites, facilities and a kiosk.

The park conserves bluegum woodland and a creek lined with aged river red gums. The riparian vegetation along the watercourse that runs directly through the park is largely comprised of weeds and exotic trees. Despite the extensive weed problem, the park provides habitat for remnant native wildlife including possums, bats, yellow-tailed black cockatoos and the introduced koala.

3.2.1 Climate

Generally, Brownhill Creek experiences a climate marked by seasonal variation in rainfall and temperature, with cool, wet winters with warm to hot, dry summers. Temperatures are, on average, highest during the months of January and February, with hot weather continuing into March. In most years, maximum temperatures exceed 38°C on several days. These hot days are generally accompanied by hot northerly winds, often brought to an end by a south-westerly wind change.

Annual precipitation is similar to that recorded for Adelaide, being 750-900mm, but slightly higher because of the foothill location. The majority of rainfall occurs between May and September.

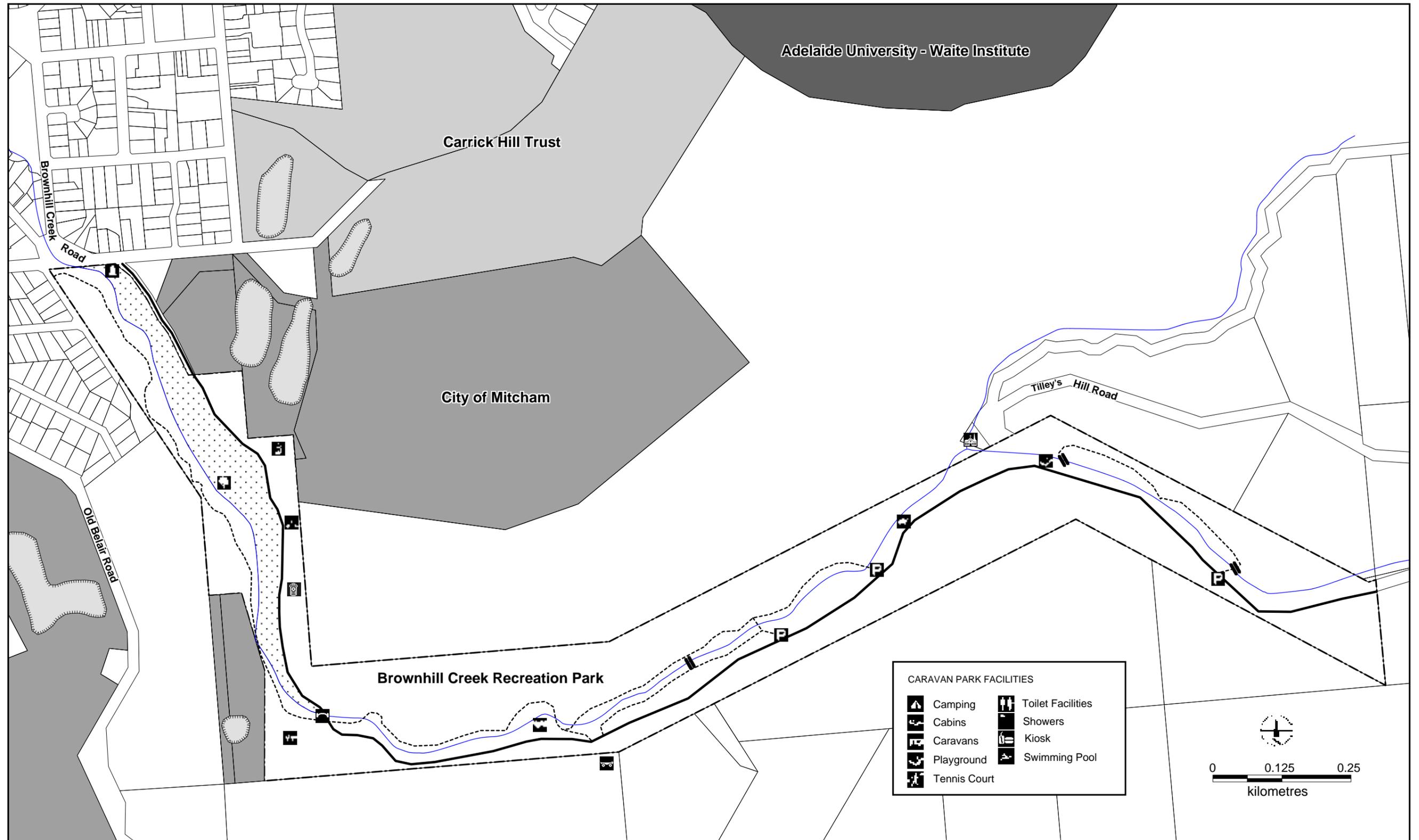


Figure 2
Brownhill Creek Recreation Park
Features

LEGEND			
	Quarry		Concrete Crossing
	Caravan Park		Wirraparinga Trail
	City of Mitcham - Land		Brownhill Creek Road
	Carrick Hill Trust - Land		Park Boundary
	Adelaide University - Land		Creekline
	Parking		Horse Arena
	Seven Sisters Planting		Monarch of the Glen
	Lions Club Picnic Ground		Manure Pits
	Monument		Historic Rock Crushing Plant
	White's Bridge		Historic Drinking Fountain
			Viney's Bluestone Quarry
			Historic Wagon Loading Site (external to park)
			Historic Chapel Site (external to park)

3.3 Regional Setting

Department for Environment and Heritage

Brownhill Creek Recreation Park is in the Adelaide Region of the Department for Environment and Heritage and one of sixteen parks in the Sturt District, with most staff based at the district headquarters in Belair National Park. Other reserves in the vicinity include Belair National Park, Sturt Gorge and Shepherds Hill Recreation Park.

National Reserve System and CARRS

Brownhill Creek Recreation Park forms part of the National Reserve System (NRS), which encompasses all existing protected areas managed and/or administered by State or Commonwealth nature conservation agencies.

The aim of the National Reserve System is to establish a Comprehensive, Adequate and Representative Reserve System (CARRS) for the protection of Australia's biodiversity according to the following principles;

- Comprehensiveness; inclusion of the full range of ecosystems recognised at an appropriate scale within and across each bioregion.
- Adequacy; ability to maintain the ecological viability and integrity of populations, species and communities.
- Representativeness; those areas that are selected for inclusion in reserves reasonably reflect the biotic diversity of the ecosystems from which they derive.

The contribution of Brownhill Creek Conservation Park to the National Reserves System is important due to the fragmented distribution of protected areas and the poor representation of many environmental associations within Government reserves and protected areas.

Biogeographic Regionalisation and Environmental Associations

The Interim Biogeographic Regionalisation of Australia (IBRA) provides a bioregional planning framework within which to identify the gaps and to set priorities for developing the National Reserve System. IBRA regions represent a landscape based approach to classifying the land surface from a range of continental data on environmental attributes. In 1999, IBRA version 5.1 was developed with 85 bioregions delineated, each reflecting a unifying set of major environmental influences which shape the occurrence of flora and fauna and their interaction with the physical environment.

Brownhill Creek Recreation Park lies within the Flinders Lofty Block IBRA region, which is described as temperate to arid Proterozoic ranges, alluvial fans and plains, and some outcropping volcanics. The semi arid to arid north supports native cypress, black oak, (belah) and mallee open woodlands, Eremophila and Acacia shrublands, and bluebush/saltbush chenopod shrublands, while the south supports low open woodlands of Eucalyptus obliqua, E. baxteri, E fasciculosa and E. cosmophylla. (Environment Australia 2000).

The Flinders Lofty Block IBRA region totals 7,131,816 (ha) and has been extensively cleared of native vegetation for agriculture and urban development. Remaining native vegetation is highly fragmented and only 5.5% of the Flinders Lofty Block's area is conserved in protected areas.

Within the Flinders Lofty Block IBRA region, Laut *et al* (1977) recognise a series of Environmental Associations (EA's) and describe the Mt Terrible EA incorporating Brownhill Creek Recreation Park. The Mt Terrible EA is described as "ridges and hills with steep slopes on metasediments. There is a mixed cover of open parkland over pasture and orchards, with much of the association urban fringe and part of a recreation resource for metropolitan Adelaide."

Prior to colonial settlement, the Mount Lofty Ranges, together with the Adelaide Plains, is believed to have held the State's richest source of biodiversity (Turner 2000). Today, it is estimated that less than 15% of the original native vegetation remains in the Mount Lofty Ranges (Turner 2000), and only 4% of remaining native vegetation is protected (Long 1999).

There is a widely recognised benchmark that at least 15% of an original ecosystem should be conserved where possible. The contribution made by even small, linear parks such as Brownhill Creek Recreation Park to conservation is important, despite the special management requirements imposed by the park's close proximity to the urban environment.

Regional Biodiversity Planning

On-park biodiversity conservation should integrate with broader regional programs. In order to do this DEH is developing the *Biodiversity Plan for the Mount Lofty Ranges, South Australia*. This plan will become a guide for the community and government on the biodiversity assets of the region, major threats and recommendations on priority management strategies for conservation. It will provide information on the priority areas, vegetation types and species of the region, and strategic actions to assist in maintaining biodiversity for the future.

The Greater Mount Lofty Parklands

Brownhill Creek and other reserves within the Adelaide Region are being managed in the broader context of a planning initiative known as The Greater Mount Lofty Parklands 'Yurrebilla'. The name was assigned in recognition of Kaurna culture and heritage. The aim of this project is to establish an integrated and cooperative management framework for approximately 40,000 hectares of land throughout the Mount Lofty Ranges that is variously managed by DEH, Forestry SA, SA Water, and Planning SA. 'Yurrebilla' can also include local government land and voluntarily nominated, privately owned areas.

This initiative seeks to identify common natural, heritage and recreation resources and to develop regional-level policies that will enable a consistent management approach to be adopted throughout the region.

Heritage Agreements

Within the local region, there are several private properties protected by Heritage Agreements under the *Native Vegetation Act 1991*, that assist with the preservation of biodiversity in the Mount Lofty Ranges (Figure 1). These protected areas provide stepping stones or links that can facilitate movement of species, improve overall genetic diversity and boost ecosystem sustainability.

Furthermore, some substantial blocks of land adjacent or near to the reserve are managed for conservation by the University of Adelaide, Waite Institute (Figure 2).

Local Government Area

Brownhill Creek Recreation Park is in the City of Mitcham council electorate and is surrounded by residential properties and council reserves (Figure 2). Access to several properties adjoining the park is restricted to the DEH managed internal road that dissects the park.

Brownhill Creek Recreation Park falls within the Hills Face Zone (Figure 3) as delineated in the City of Mitcham Development Plan. Stretching from Willunga to Gawler, the Hills Face Zone encompasses much of the western slopes of the Mount Lofty Ranges and includes important national parks, reserves and open spaces. The Hills Face Zone was developed to guide future development and prevent the loss of remnant vegetation, open space and visual amenity.

The main objectives under the Hills Face Zone development principles are as follows:

Objective 1 A zone in which the natural character is reserved and enhanced or in which a natural character is re-established in order to:

- a) Provide a natural backdrop to the Adelaide plains and a contrast to the urban area;
- b) Preserve and develop native vegetation and fauna habitats close to metropolitan Adelaide;
- c) Provide for passive recreation in an area of natural character close to the metropolitan area
- d) Provide a part of the buffer area between metropolitan districts and prevent the urban areas extending into the western slopes of the Mount Lofty Ranges; and
- e) Ensure that the community is not required to bear the cost of provided services to land in the zone.

Objective 2 A zone accommodating low-intensity agricultural activities and public/private open space and one where structures are located and designed in such a way to:

- a) Preserve and enhance the natural character or assist in the re-establishment of a natural character in the zone;
- b) Limit the visual intrusion of development in the zone, particularly when viewed from roads within the zones or from the Adelaide plains;
- c) Not create, either in themselves, or in association with other developments, a potential demand for the provision of service at a cost to the community; and
- d) Prevent the loss of life and property resulting from bushfires.

All building works or changes in land use within the park must be consistent with the policies of the Hills Face Zone.

Moreover, due to the park's location within the Hills Face Zone and proximity to residential properties, management of Brownhill Creek Recreation Park must consider the broader regional pattern of land use, community activity and values including:

- the impact of off-park land use and the application of the *Development Act 1993* to control upstream and neighbouring development proposals;
- the need for pest plant and animal control, water catchment and soil conservation, fire management and other regionally based land management practices to be integrated with the efforts of neighbouring land owners;
- the importance of maintaining liaison with key stakeholders and others who have an interest in how the park is managed, including neighbouring property owners;
- the importance of the park to regional history, and the recreation it provides for local residents and tourists.

With these principles in mind, it is important to establish and maintain formal and informal links between park management and other authorities responsible for natural resource management within the Mount Lofty Ranges, including volunteer organisations and local residents. The purpose of these links is to facilitate sharing information as well as implementing effective regional environmental planning initiatives. The Department for Environment and Heritage will involve organisations including the Department for State Aboriginal Affairs, Native Title Claimants, the representative Kurna Aboriginal Heritage Committee, City of Mitcham, Patawalonga Catchment Water Management Board, the Heritage branch of DEH, Office for Recreation Sport & Racing, the Mount Lofty Ranges Catchment Program, the Friends of Brownhill Creek, the wider community and other relevant bodies, in discussions regarding the implementation of this management plan.

3.4 History of Reserve Management

Brownhill Creek Recreation Park is one of Adelaide's oldest reserves and a popular recreation destination for generations of South Australians.

Brown Hill itself appears as one of the trig points on survey maps dated in 1839 that were published by the British Parliamentary House of Commons in 1841.

Brownhill Creek Reserve was set aside originally in 1841 for "public purposes" after a specimen of freestone was obtained from a quarry recently opened near Brownhill Creek (see 4.3.2 Colonial History). The land surrounding the reserve was progressively surveyed up until 1854, consequently the Brownhill Creek Reserve did not appear on maps for the area until 1858.

In 1889 the reserve was placed under the control of the District Council of Mitcham by proclamation made under the *Crown Lands Act 1888* and the *District Councils Act 1887* (see Appendix B). While under the control of the Mitcham Council, two sets of manure pits were built, one in 1891 and another in 1893, to prevent pollution of the creek. Only the 1891 set remains, which is on the State Heritage Register. In 1894, swimming baths were constructed for public recreation and in the immediate area surrounding Brownhill Creek, Mitcham Council administered the leases for several quarry operations on behalf of the Crown, including a quarry just west of the Lions Club picnic ground, which operated until 1911.

Mitcham Council continued management until 1915, when the reserve was dedicated a National Pleasure Resort. In 1954 a campground was declared near the entrance of the Brownhill Creek valley, which included 2 toilets, ablution blocks and a laundry built from Horsnell Gully freestone.

Brownhill Creek was later proclaimed a Recreation Park under the *National Parks and Wildlife Act 1972* and management transferred to DEH. The provision of services and facilities for visitors has been further developed to include a kiosk, swimming pool, tennis courts, walking trails and interpretive information.

Unfortunately, invasion by introduced species has reduced the quality of the natural environment and in its current state, Brownhill Creek Recreation Park is considered to have relatively low biodiversity values when compared to other *National Parks and Wildlife Act* reserves within the region. However, the park's historic value is considerable, with several historic remnants which contribute an important part of the park's heritage value.

The following management actions have occurred in the absence of a management plan:

- Establishment of an active Friends of Brownhill Creek Recreation Park.
- Improved knowledge of natural and cultural resources and threatening processes.
- Ongoing weed management and bushfire prevention measures.
- Development of park information brochure and interpretive services.
- Transfer of caravan park operation to a lease agreement.
- Construction of a road to bypass the caravan park to increase safety.
- Restoration of the Manure Pits.
- Preparation of the *Brownhill Creek Recreation Park Vegetation Management Plan* (Kinnear *et al* 2001).

3.5 Existing Management Arrangements

The Brownhill Creek Caravan Park operates under a lease agreement and provides caravan and camping opportunities for visitors, including a kiosk and recreation facilities. Due to seasonal fluctuations in visitor numbers, some caravans are managed under long-term lease arrangements.

Due to the suburban location of the park, there are a number of sites and items of infrastructure relating to telecommunications, power supply and civic facilities such as refuse collection. Operators of these are provided ongoing rights of access and maintenance.

Park management has also established working relationships with the following agencies and community groups:

- Friends of Brownhill Creek Recreation Park – coordinate and conduct volunteer work in liaison with park managers including revegetation, weed removal, walking trail development and established the 'Adopt a piece of park' initiative, which encourages individuals, groups, schools and clubs to become involved in ongoing revegetation under the direction of the Friends of Brownhill Creek. Groups involved are all financial members of the Friends of Brownhill Creek.

The following groups participate in 'Adopt a piece of park':

- Brownhill Creek Horseriders – maintain the horse arena and are progressively screening this area with native plantings.
- 2nd Adelaide Scout Group – revegetation surrounding the carpark upstream of the 7 sisters.
- Mount Barker Rotaract – restoration of the Manure Pits.
- Mitcham Historical Society – restoration of the Manure Pits.
- Mitcham Lions Club – maintenance of the Lions Club picnic ground.
- City of Mitcham – currently provides road repair and has collaborated with DEH for maintenance of the Brownhill Creek bridge.
- Patawalonga Catchment Water Management Board – involved in programs to improve water quality and undertake watercourse restoration, including revegetation demonstration sites.

- Urban Forest Biodiversity Program – a program which encourages, supports and coordinates the protection and restoration of native vegetation projects conducted by landholders and community groups.
- Brownhill Creek Association - property owners within the vicinity of the park, who have been undertaking land and water rehabilitation over the past decade.
- Department of Correctional Services – provide human resources for woody weed control.
- Rotary Club – involved in weed removal and revegetation of the creek and its surrounds.

3.6 Management Philosophy & Strategic Directions

The role of reserves is predicated by the twin aims of the *National Parks and Wildlife Act 1972*; to provide for public benefit and enjoyment and to conserve wildlife in a natural environment.

Recreation parks in particular are proclaimed under the Act to be conserved and managed “for public recreation and enjoyment.” Increasingly, however, the importance of biodiversity conservation is being recognised and the future use and management of all reserves must address this issue.

Brownhill Creek Recreation Park provides social benefit because it offers a ‘natural’ experience in an urban environment. Park management needs to strike a balance between conservation and recreation to maintain and protect the very resource that provides the attraction. Leisure trends and changing perceptions of the nature and role of a Recreation Park will also need to be considered in decisions regarding the suitability of any recreational activity and on the provision of facilities in the park.

Brownhill Creek Recreation Park will be managed according to DEH policies and priorities. Strategic directions for the DEH are outlined in the *Department for Environment and Heritage - Strategic Plan 2002 - 2005*, which endeavours to achieve:

- *A Sustainable and Eco-efficient Society* – Viable, innovative and sustainable communities where individuals, households, businesses and government use resources efficiently, with minimal waste and minimal other environmental impacts.
- *Clean Air, Water and Land* – Healthy environments capable of supporting richly diverse life into the future.
- *Conserved Ecosystems* - viable populations of native plants and animals and viable ecosystems for future generations.
- *Conserved and Celebrated Heritage* - Conservation of significant heritage to identify and celebrate the landscapes, human history and sense of place of the land now known as South Australia.
- *Sustainable Use of Natural Assets and Resources* - Sustainable use and enjoyment of natural assets and resources to enhance prosperity, a sense of community and quality of life.

DEH aims to optimise the use of limited resources available for the conservation and maintenance of reserves, with priorities set on a statewide and then regional perspective.

Within the Adelaide region, most resources are allocated to the maintenance of areas of mature, stable, biologically diverse habitats containing species or communities of state significance and to locations with intensive, concentrated public use. It is recognised that, in allocating resources for annual work programs, Brownhill Creek Recreation Park competes with other regional and state priorities.

However, in partnership with the community and other agencies, DEH believes that considerable progress can be made towards increasing protection of biological and cultural values, while providing quality recreational opportunities for visitors.

To achieve this, DEH recognises the importance of community and volunteer organisations and will continue to provide ongoing support and assistance. DEH will also engage in formal discussions to explore partnership arrangements with the City of Mitcham, the Patawalonga Catchment Water Management Board, Native Title Claimants, the representative Kurna Heritage Committee as nominated by the State Aboriginal Heritage Committee and any other organisation that has an interest in the management of the park.

4 MANAGEMENT PRESCRIPTION

4.1 Zoning

Section 39 of the *National Parks and Wildlife Act 1972* provides for the designation of zones in a reserve and constrains the use of land in those zones to the conditions specified in an adopted management plan. Zoning aims to ensure that public use and management actions remain compatible with the protection of park values.

The management zones described below and shown in Figure 3, establish a framework for the sustainable use of the reserve during the life of this plan.

Objectives

Zone Brownhill Creek Recreation Park to ensure appropriate public use, landscape protection and the conservation of wildlife habitats and cultural features.

Actions

- Designate and adopt the following zones as shown on Figure 3:

Recreation Zone

The recreation zone contains the majority of the park including the Lions Club picnic ground, the horse-training arena, allocated walking trails, carparks and Brownhill Creek Road. The recreation zone is intended to permit a range of recreation activities and to provide facilities and services for visitors, with some infrastructure for park management. However, every effort will be made to minimise disturbance.

Preferred sites for any development of facilities, including walking trail construction, are those with established infrastructure or in areas where past disturbance has already caused significant impact.

Dogs are permitted throughout the Recreation Zone only if restrained on a lead and directly under the control of a responsible person. Horses are also permitted on the road and the horse training arena.

Conservation Zone and Heritage Sites

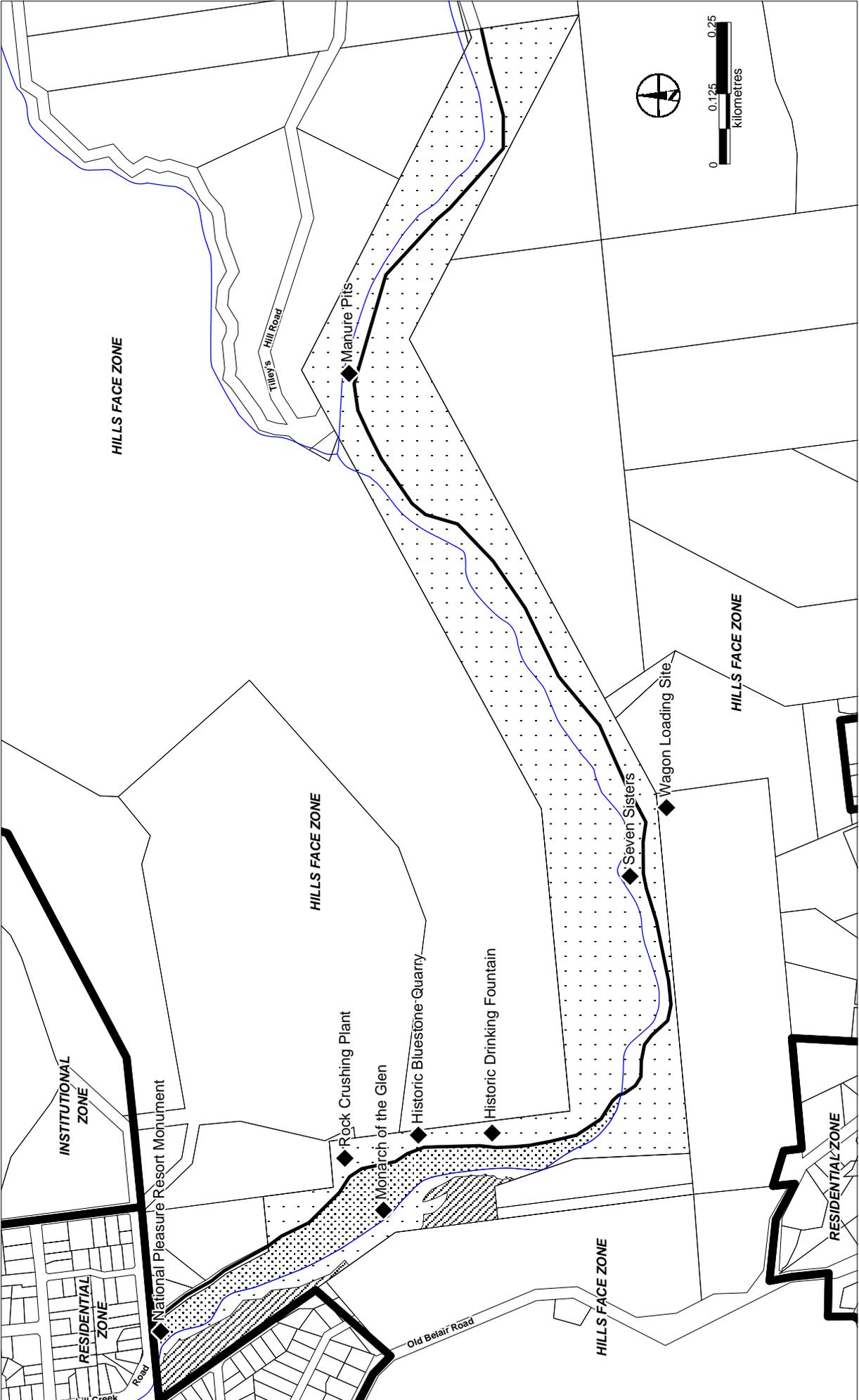
The conservation zone and heritage sites occur within the recreation zone, but have been set aside to conserve biodiversity and cultural values. Heritage sites include a number of significant heritage features including the manure pits, the Monarch of the Glen historic tree, Viney's bluestone quarry, remnant foundations of Mundy's rock crushing plant and will also include any other newly identified historic sites or significant cultural features.

Construction at heritage sites is restricted to restoration of heritage items, interpretive information and works as a result of safety requirements.

The conservation zone incorporates the grey box habitat identified within the *Brownhill Creek Recreation Park Vegetation Management Plan* (Kinneer *et al* 2001) as being of high conservation significance. No developments are permitted within this zone other than maintenance of existing walking trails and signs. Any further development of tracks within this zone will be subject to a biological assessment. Any newly recognised habitats of conservation significance will be included in this zone and managed accordingly.

Leased Zone

This zone contains the Brownhill Creek Caravan Park, leased by DEH to a private operator. DEH recognises the long-term lease and supports the continued operation of the caravan park. The lessee will be encouraged to upgrade facilities according to the Hills Face Zone principles. The current lessee does not permit dogs in the leased zone.



LEGEND

- Road
- ▬ Council Zone Boundary
- ~ Creepline
- ▨ Conservation Zone
- ◊ Heritage Site
- ▭ Recreation Zone
- ▭ Leased Zone

Figure 3
Brownhill Creek Recreation Park
Zoning

4.2 Natural Resources

4.2.1 Geology, Soils and Landform

Background

Rocks that make up the Mount Lofty Ranges began to form some 800 million years ago. Siltstone and limestone was deposited in shallow seas that once covered the area. Intense geological activities changed the physical structure of sediments to form slate and quartzite. Over time, Brownhill Creek has carved a steep wide valley depositing fertile alluvial soils through the valley and onto the plains.

According to a geotechnical report prepared by Golder Associates (1998) and the Adelaide geological map sheet (scale 1:50,000) prepared by the Department of Mines and Energy, the creek bank is underlain by Mitcham quartzite, with quaternary alluvium in the lower part of the gully near the creek. Furthermore, according to Plan L74-1 "Location of Main Geological Faults" prepared by the Department of Mines and Energy, an interred fault "Brownhill Creek Fault" dissects the park in the vicinity of Whites Bridge (see Figure 2) in a north east to south west direction.

The Unley-Beaumont-Belair-Brownhill Creek Soil Map 1970, Department of Mines 1:15840 describes the soil classification within the park as Slopewash. Soils within the park strongly reflect valley erosion processes and are often shallow and overlaying bedrock. Within the creek, poorly drained black, self-cracking clays are apparent with a high organic content. The sides of the gully tend to have well drained, shallow, red brown earths without profile development that are vulnerable to erosion, particularly on steeper slopes subject to disturbance, for example where walking trails require maintenance.

Unauthorised activities such as horse riding, mountain bike riding and irresponsible driving off designated tracks can cause localised but often severe soil erosion and soil compaction.

Visitors should be informed of the erosion-prone areas and requested to avoid unnecessary intrusion by using the designated tracks provided. Appropriate barriers should also be erected to reduce erosion in sensitive and high impact areas.

Refer to 4.2.2 Hydrology for streambed and streambank erosion.

Objectives

Protect soils from adverse impacts and limit erosion to natural processes.

Actions

- Assess soil type and properties, including erosion potential, when planning for visitor access or undertaking management activities and development works.
- Permit bicycle and horse riding on designated tracks only and restrict access to sensitive areas by erecting appropriate barriers.
- Provide and update interpretive material to encourage visitors to use existing walking trails and to avoid erosion-prone areas.
- Identify existing areas of erosion and undertake remedial work that includes natural regeneration, revegetation and pest plant removal, in accordance with the *Brownhill Creek Recreation Park Vegetation Management Plan* (Kinnear *et al* 2001).
- Improve, repair and maintain walking trails to stabilise soil as required.

4.2.2 Hydrology

Background

Brownhill creek flows generally toward the north west, directly through the park. The creek is heavily infested with introduced species including weeping willow (*Salix babylonica*), desert ash (*Fraxinus rotundifolia ssp. rotundifolia*), and bridal creeper (*Myrsiphyllum asparagoides*).

The Friends of Brownhill Creek participate in Waterwatch, a national volunteer-based water monitoring and education program that aims to raise awareness and encourage local communities to take responsibility for improving and maintaining water quality in catchments. The program involves regular water analysis tests and ongoing monitoring, and has been conducted by the Friends of Brownhill Creek for the last 3 years.

The Patawalonga Catchment Water Management Board (PCWMB), who are responsible for improving water quality through improved catchment management practices, assist park management by ensuring that all activities along the creek of the catchment are compatible with the preservation of natural flows and the conservation of biodiversity. This ensures that all aspects of the natural resources of the catchment will be effectively managed for the benefit of the public and the natural environment. (BC Tonkin 1997)

Under natural conditions, creeks have some inherent degree of fluidity as they meander across their floodplain. An equilibrium would have existed between natural erosion forces and the original floodplain and catchment land cover. Extensive changes to land cover have disturbed this balance and the stream system has initiated a new cycle of instability and erosion.

Historic vegetation clearance and drainage modification through development (roads, buildings, drains etc) in the Brownhill Creek catchment has caused altered stream flows, which are now causing excessive streambank and streambed erosion. Uncontrolled public use and loss of aquatic and riparian vegetation exacerbate this. Erosion is so severe that it threatens to undercut the road in several places.

Due to Adelaide's Mediterranean climate and environment of slopes and plains, changes to ground cover and drainage can also lead to rapid run-off when it rains. Historic evidence and hydrological modelling produced by PCWMB indicate that the Brownhill Creek catchment is susceptible to flooding.

Flooding is most likely to occur after a long duration of rainfall, due to the combined effects of runoff from the urban area and a substantial contribution from the rural catchment, which becomes saturated in these long duration storms.

DEH should collaborate with the PCWMB and the City of Mitcham to implement flood mitigation measures, which may contribute to the reduction of flood damage in the Brownhill Creek catchment, outlined in the *Brownhill Creek and Environs Action Plan - Technical Report No.4 Flood Management* (PCWMB *et al* 1998). Extensive mitigation measures will be subject to public consultation.

Objectives

Restore and maintain natural hydrology as far as possible.

Actions

- Participate in regional catchment management programs in partnership with the PCWMB to minimise negative impacts to the Brownhill Creek catchment.
- Collaborate with the PCWMB to identify and repair existing areas of erosion through coordinated revegetation and pest plant eradication programs, in accordance with the *Brownhill Creek Recreation Vegetation Management Plan* (Kinnear *et al* 2001).
- Continue to encourage and support the involvement of the Friends of Brownhill Creek and other volunteers in revegetation programs and the monitoring of water quality.

- Continue to support the environmental restoration of Brownhill Creek and manage the terrestrial areas of the reserve in a manner that positively contributes to water quality in Brownhill Creek.
- Contribute to and support flood mitigation schemes outlined in the *Brownhill Creek and Environs Action Plan - Technical Report No.4 Flood Management* (PCWMB *et al* 1998).

4.2.3 Native Vegetation

Native vegetation in the park is sparsely distributed and suffers from severe competition from a variety of introduced species. According to the Reserves' Database (2003) and a recent survey (Kinnear *et al* 2001), there are 99 native plant species recorded for the park, including 27 of conservation significance (see Appendix C). A more comprehensive description of vegetation associations can be found in the *Brownhill Creek Recreation Park Vegetation Management Plan* (Kinnear *et al* 2001).

River Red Gums (*Eucalyptus camaldulensis*), Swamp Wattle (*Acacia retinodes var. retinodes*) and Swamp Club Rush (*Isolepis inundata*) occur along the creek flats amongst numerous woody weed species.

Drooping Sheoaks (*Allocasuarina verticillata*) are present on the hill slopes, with Grey Box (*Eucalyptus microcarpa*) woodland in the northwest portion of the park. South Australian Blue Gum (*Eucalyptus leucoxylon*) woodland remains over much of the remaining hillslopes along with a few native shrubs, including Kangaroo Thorn (*Acacia paradoxa*) and Golden Wattle (*Acacia pycnantha*).

Groundcover plants are almost entirely confined to higher areas of the park and include Dense-flowered Mat Rush (*Lomandra densiflora*), with two New Holland Daisy species (*Vittadinia blackii*) and (*Vittadinia australasica*). Grasses include, Brush Wire Grass (*Aristida behriana*), Black-head Grass (*Enneapogon nigricans*), Kangaroo Grass (*Themeda triandra*), at least four species of Spear Grass (*Stipa* spp) and several Wallaby Grass (*Danthonia caespitosa*) species. Several clumps of Bulrush (*Typha domingensis*) exist along the creek.

Grey Box (*Eucalyptus microcarpa*) is rated uncommon in the southern Mount Lofty Ranges and has been accorded a high priority for conservation (Neagle 1995). Grey Box once grew as woodland that extended into the foothills, but today it has been lost to development, except for remnant pockets on the western face of the foothills. One pocket occurs in the north west portion of the park and occupies approximately 20% of the total park area. In a recent survey (Kinnear *et al* 2001), several native species were recorded within the Grey Box association including Sticky Sword-sedge (*Lepidosperma viscidum*), Gold Dust Wattle (*Acacia acinacea*), Native Cranberry (*Astroloma humifusum*), Sweet Bursaria (*Bursaria spinosa*) and a number of annual and perennial weed species including Olive (*Olea europaea*), Large Quaking Grass (*Briza maxima*), False Brome (*Brachypodium distachyon*) and Boneseed (*Chrysanthemoides monilifera*).

In terms of weed invasion the Grey Box community appears the least affected and rehabilitation efforts have been conducted by the Friends of Brownhill Creek using bushcare principles of minimal disturbance and direct seeding. Species of native vegetation associated with Grey Box woodland are described in the *Brownhill Creek Recreation Park Vegetation Management Plan* (Kinnear *et al* 2001).

The main threat to plant biodiversity conservation is perceived to be the high level of introduced species. To help define future management actions, a 400 x 50 metre demonstration site was established along the creek within the reserve in 1998/99, where introduced plants were removed and a revegetation strategy implemented. The project was established to demonstrate the standard of rehabilitation that could be achieved along the length of the creek with appropriate management. The project was a successful joint exercise between the Patawalonga Catchment Water Management Board, the City of Mitcham, local community service groups and DEH. However, the site has received minimal ongoing maintenance and introduced plants are now threatening its integrity.

Ongoing maintenance of the demonstration site is required to retain the value of the works undertaken, especially through ongoing weed control (see 4.2.5 Introduced Plants). DEH would also support and encourage the area being extended as resources become available.

Recently, the *Brownhill Creek Recreation Park Vegetation Management Plan* (Kinnear *et al* 2001) was produced for DEH and PWCMB. The management of native vegetation within the park will be guided by this document, which advocates a strategic approach to conservation management and recommends actions to control the spread of introduced plants, identifies communities of conservation significance and recommends strategies to ensure their survival.

Revegetation conducted by the Friends of Brownhill Creek has involved planting trees and shrubs from tubestock to selected sites. Weed control work prior to replanting has been an integral part of their projects. It is important to establish future native vegetation management programs according to recommendations and priorities in the *Brownhill Creek Recreation Park Vegetation Management Plan* (Kinnear *et al* 2001).

DEH also has an interest in landowners adjacent to the reserve and upstream of the reserve managing remnant native vegetation in a manner that protects and improves natural biodiversity and contributes to the creation of biological corridors and improved catchment water quality.

Objectives

Conserve native vegetation in the park and reduce threats, particularly to plants of conservation significance.

Actions

- Assess natural regeneration, identify rehabilitation priorities and integrate weed control programs according to recommendations in the *Brownhill Creek Vegetation Management Plan* (Kinnear *et al* 2001).
- Implement the *Brownhill Creek Vegetation Management Plan* (Kinnear *et al* 2001) to effectively protect and enhance native vegetation and species of conservation value.
- Record on a database with GIS capability, the location and distribution of existing and newly discovered plants or habitats of conservation significance, monitor their populations and implement species management programs if necessary.
- Support and encourage the Friends of Brownhill Creek and other volunteer organisations and individuals, to continue revegetation programs and to assist with monitoring species of conservation significance in collaboration with DEH.
- Encourage and participate in ongoing maintenance of the PCWMB demonstration site and support the establishment of future sites.

4.2.4 Native Fauna

Background

Although the park is surrounded by residential properties and significantly disturbed by human activity, Brownhill Creek nevertheless functions as a refuge for wildlife, making the identification and protection of native fauna habitat important.

Mammals

Opportunistic sightings have been made of 7 native mammal species, including several sightings of the Southern Brown Bandicoot (*Isoodon obesulus*), classified as endangered on a national scale under the *Environment Protection and Biodiversity Conservation Act 1999* and vulnerable in South Australia under *Schedule 8* of the *National Park and Wildlife Act 1972*. A comprehensive survey has not yet been undertaken and the list of animal species is likely to increase with further investigation. The following mammals have been recorded for the park:

Table 1: Native Mammal Species

Species	Common Name	EPBC Act	NP&W Act
<i>Isoodon obesulus</i>	Southern Brown Bandicoot	E	V
<i>Trichosurus vulpecula</i>	Brush-tail Possum		
<i>Phascolarctos cinereus</i>	Koala *		R
<i>Pseudocheirus peregrinus</i>	Ring-tail Possum		
<i>Rattus lutreolus</i>	Swamp Rat		
<i>Rattus fuscipes</i>	Bush Rat		
<i>Tachyglossus aculeatus</i>	Echidna		

* Note: Brownhill Creek is not considered part of the former distribution range of the koala.
See Appendix F For Conservation Status Codes

The Southern Brown Bandicoot was once widespread across the Mount Lofty Ranges, but due to heavy predation by foxes, numbers have declined dramatically. Today, the range and distribution of bandicoots is concentrated along blackberry-infested creeklines. Recent sightings from neighbouring landowners suggest that a population could exist in the Brownhill Creek Catchment.

The status of bats within the park is inconclusive, but there have been several opportunistic sightings in the park, and species found at Belair and Black Hill are likely to occur at Brownhill Creek (Reardon pers com). The following bat species are likely to occur in the park:

Table 2: Native Bat Species

Species	Common Name	EPBC Act	NP&W Act
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat		
<i>Chalinolobus morio</i>	Chocolate Wattled Bat		
<i>Mormopterus planiceps</i>	Southern Freetail Bat		
<i>Nyctophilus geoffroyi</i>	Lesser Long Eared Bat		
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail Bat		R
<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat		R
<i>Tadarida australis</i>	White-striped Freetail Bat		
<i>Vespadelus darlingtoni</i>	Large Forest Bat		
<i>Vespadelus regulus</i>	Southern Forest bat		
<i>Vespadelus vulturnus</i>	Little Forest Bat		

Note: See Appendix F For Conservation Status Codes

Birds

There are 37 native bird species recorded for the park (see Appendix E) including the Little Wattlebird (*Anthochaera chrysoptera*), Superb Fairy-wren (*Malurus cyaneus*), Rainbow Lorikeet (*Trichoglossus haematodus*), White-faced Heron (*Egretta novaehollandiae*) and the Yellow-tailed Black Cockatoo (*Clyptorhynchus funereus*), considered vulnerable in South Australia.

With the loss of native vegetation, Aleppo Pine (*Pinus halepensis*) seeds have become a major source of food for the cockatoos. Chewed cones under the pine trees are a valuable indicator of the birds presence in an area. The colour of the chewed cones can also indicate how recently they visited the tree. Native plant seeds commonly consumed by the cockatoos include those from *Hakea rugosa* and *Hakea cycloptera*. Information obtained from the dietary research is assisting in the selection of plant species for revegetation programs in key areas. South Australian research has also highlighted the need to retain some stands of Aleppo Pines until revegetated areas can support the population (van Weenan pers com). The removal of Aleppo pines from the park must be staged and in coordination with revegetation of a native food source. (see also 4.2.5 Introduced Plants)

Reptiles and Amphibians

There are 7 species of reptile opportunistically recorded for the park, including the Eastern Brown Snake (*Pseudonaja textilis*), Sleepy Lizard (*Tiliqua rugosa*), Eastern Bearded Dragon (*Pogona barbata*) Eastern Blue-tongue (*Tiliqua scincoides*), Barking Gecko (*Nephrurus milii*), Adelaide Snake-lizard (*Delma mollerii*) and the Creamed–striped Shining Skink (*Chrysolepharus virgatus*).

The park's amphibian population includes the Common Froglet (*Crinia signifera*), the Bull Frog (*Limnodynastes dumerili*) and Brown Tree Frog (*Litoria ewingi*), recorded opportunistically by local residents and/or during the annual frog census conducted by the Friends of Brownhill Creek. There are 7 species of frog in the Mount Lofty Ranges, with the Common Froglet the most common.

Fish

The introduction of exotic species of fish into watercourses has been to the detriment of native species. The Big Headed Gudgeon (*Philypnodon grandiceps*), Mountain Galaxias (*Galaxias olidus*) and Climbing Galaxias (*Galaxias brevipinnis*) the only known remaining native species.

Objectives

Identify, manage and protect all indigenous fauna inhabiting or using the park.

Actions

- Encourage approved volunteer groups and individuals to conduct fauna surveys and population monitoring.
- Record on a database with GIS capability, animal species and habitats, including opportunistic sightings of rare and endangered fauna, and monitor these populations to ensure their conservation.
- Identify and protect significant fauna habitats/food requirements and integrate habitat restoration with native revegetation efforts and weed management programs.
- Investigate opportunistic sightings to verify species identification.

4.2.5 Introduced Plants

Background

Brownhill Creek Recreation Park has 109 introduced plant species recorded (Appendix D), 9 of which are proclaimed under the *Animal and Plant Control Act (Agricultural Protection and Other Purposes) 1986* that require control under Section 57(2).

Weeds are regarded as one of the major threats to indigenous plant communities and weed invasion is seen as both a symptom and cause of degradation of native plant communities in Brownhill Creek.

The creek line is heavily infested with woody weeds, dominated by Desert Ash (*Fraxinus rotundifolia ssp. rotundifolia*) and Weeping Willow (*Salix babylonica*). Consequently, the creek line is deeply shaded with low plant species diversity, except where weeds have been removed as part of the demonstration site for weed eradication and revegetation.

Creek flats within the park are highly modified and, apart from emergent River Red Gums (*Eucalyptus camaldulensis*) and a small number of other native species, contain numerous weed species ranging from large trees and perennial shrubs to annual grasses, forbs and herbs.

Woody exotics such as Hawthorn (*Crateagus monogyna*) and Desert Ash (*Fraxinus rotundifolia ssp. rotundifolia*) tend to form dense low thickets, while many non-indigenous Australian plantings, such as Sugar Gums (*Eucalyptus cladocalyx*) are now large old trees.

Different vegetation associations establish as a result of soil type, aspect and slope. Grey Box (*Eucalyptus microcarpa*) woodland occur on the hillslopes in the northwest portion of the park, while Blue Gum (*Eucalyptus leucoxylon*) woodland occur over the remaining hill slopes, along with areas dominated by woody exotics including Olive (*Olea europaea ssp. europaea*), Hawthorn (*Crateagus monogyna*) and Aleppo Pine (*Pinus halepensis*). Differences in exposure and perhaps the influence of past land use have resulted in these weed species forming dense thickets in some locations and more open shrubland in others.

The following proclaimed plants occur in the park and require control under the *Animal and Plant Control (Agricultural Protection and Other Purposes) Act 1986*:

Table 3: Proclaimed Plants

Species	Common Name	Proclaimed
<i>Cynara cardunculus</i>	Wild Artichoke	✓
<i>Echium plantagineum</i>	Salvation Jane	✓
<i>Genista monspessulana</i>	Montpellier Broom	✓
<i>Homeria flaccida</i>	One-leaf Cape Tulip	✓
<i>Myrsiphyllum asparagoides</i>	Bridal Creeper	✓
<i>Olea europaea ssp. europaea</i>	Olive	✓
<i>Pinus halepensis</i>	Aleppo Pine	✓
<i>Rosa canina</i>	Dog Rose	✓
<i>Rubus spp.</i>	Blackberry	✓

As previously discussed (4.2.3 Native Vegetation), a demonstration site for weed eradication and revegetation was developed with involvement from DEH, the Patawalonga Catchment Water Management Board, the City of Mitcham, the Friends of Brownhill Creek and the wider community. This site and the remainder of the park require the ongoing commitment of wide-scale weed removal and control with subsequent revegetation and ongoing weed management as resources become available.

To effectively control the spread and threat of weeds, a regional integrated weed control program involving the surrounding property owners, City of Mitcham, Animal and Plant Control Board, Patawalonga Catchment Water Management Board and DEH, needs to be developed. Weed control programs should be coordinated according to priorities outlined in the *Brownhill Creek Recreation Park Vegetation Management Plan* (Kinnear *et al* 2001), and the *Animal and Plant Control Act (Agricultural Protection and Other Purposes) 1986*.

There are a number of trees within the park that have been planted. During the 1960's a number of non-indigenous Australian species were planted including Sugar Gums (*Eucalyptus cladocalyx*). However, judging by the size of individual trees, some plantings of sugar gum pre-date this effort. According to the Heritage branch of DEH, some of the first plantings of sugar gums in Adelaide were around the Waite Institute, planted by Peter Waite in the 1890's. The sugar gums at Brownhill Creek may date from a similar period.

Other planted species were commemorative plantings and considered part of the park's cultural heritage. These include a group of Stone Pines (*Pinus pinea*) named "The Seven Sisters", believed to have been planted by dignitaries to commemorate Federation in 1901. Of the original seven, only five remain, three of which are living.

2001 marked the centenary of the establishment of the Federation of Australia. It would be appropriate to replace these now senile trees with a more appropriate species, for example River Red Gum (*Eucalyptus camaldulensis*). However, some planted non-indigenous trees are considered significant and protected under the *Development Act 1993* and any replacement plans contemplated for the Seven Sisters must consider these requirements.

DEH is responsible for the conservation of trees that are significant for their natural or cultural values. However, where a tree is causing damage to property or is considered a safety hazard, appropriate steps, including removal if necessary, will be taken to ensure safety requirements are maintained. The removal of hazardous trees will be undertaken according to current safety procedures.

Furthermore, Aleppo Pines (*Pinus halepensis*) are an important food source for the Yellow-tailed Black Cockatoo (*Clyptorhynchus funereus*) (see 4.2.4 Native Fauna). Removal of Aleppo Pines will need to be staged and in coordination with planting their native food source Dwarf Hakea (*Hakea rugosa*) and/or Elm-seed Hakea (*Hakea cycloptera*).

The following non-indigenous species have been planted in the park:

Table 4: Non-indigenous Planted Species

Species Name	Common Name
<i>Ceratonia siliqua</i>	Carob
<i>Eucalyptus citriodora</i>	Lemon Scented Gum
<i>Eucalyptus cladocalyx</i>	Sugar Gum
<i>Eucalyptus ficifolia</i>	Red Flowered Gum
<i>Ficus macrophylla</i>	Moreton Bay Fig
<i>Fraxinus rotundifolia</i> ssp <i>rotundifolia</i>	Desert Ash
<i>Pinus halepensis</i>	Aleppo Pine
<i>Pinus pinea</i>	Stone Pine
<i>Platanus x acerifolia</i>	London Plane
<i>Populus nigra</i>	Lombardy Poplar
<i>Quercus robur</i>	English Oak
<i>Robinia pseudoacacia</i>	White Acacia
<i>Salix babylonica</i>	Weeping Willow
<i>Salix discolor</i>	Willow
<i>Ulmus suber</i>	Cork Elm

Note: It is unlikely that hawthorn and olive were originally planted in the park, but propagated by seed from outside the park. Some other planted species are also now propagating by seed.

Objectives

Control and if possible eliminate proclaimed plants and minimise the impact of introduced species.

Actions

- Fulfil the obligations of the *Animal and Plant Control (Agricultural Protection and Other Purposes) Act 1986* within allocated resources.
- Encourage the development of and contribute to integrated regional weed control programs that will establish pest plant control priorities and actions, and combine weed control with native revegetation efforts.
- Implement the *Brownhill Creek Recreation Park Vegetation Management Plan* (Kinnear *et al* 2001), which sets long-term, achievable, measurable goals and includes programs for coordinated pest control, land rehabilitation and revegetation.
- Investigate the replacement of the remaining Seven Sisters commemorative plantings with seven red gums to commemorate the Centenary of Federation.
- Provide adequate protection for significant trees and collaborate with the Heritage branch of DEH, Mitcham City Council and others to identify trees considered significant under the *Development Act 1993* and/or the *Heritage Act 1993*.
- Ensure correct safety procedures and precautions are undertaken when removing trees causing damage to property or considered a safety hazard.
- Provide interpretive information on the adverse impacts of introduced plants to increase public awareness.
- Investigate the potential for alternative funding for weed management.
- Stage the removal of Aleppo Pines (*Pinus halepensis*) in coordination with revegetation programs using native food species Dwarf Hakea (*Hakea rugosa*) and/or Elm-seed Hakea (*Hakea cycloptera*) for the Yellow-tailed Black Cockatoo.

4.2.6 Introduced Animals

Background

Given the park's proximity to residential properties, there have been no comprehensive introduced animal control programs operating in the park due to the risk of domestic animals inadvertently consuming bait targeted for introduced species.

Predators such as foxes and cats have a considerable impact on indigenous animals, birds, reptiles and invertebrates. Careful management through integrated pest control programs is necessary to ensure that pest numbers are reduced with minimal impact on native flora and fauna.

The following introduced animals have been sighted in the park:

Table 5: Introduced Animal Species

Species	Common Name
<u>Fish</u>	
<i>Salmo trutta</i>	Brown Trout
<u>Mammals</u>	
<i>Felis catus</i>	Feral Cat
<i>Lepus capensis</i>	Brown Hare
<i>Mus musculus</i>	House Mouse
<i>Oryctolagus cuniculus</i>	European Rabbit
<i>Rattus rattus</i>	Black Rat
<i>Vulpes vulpes</i>	Fox
<u>Birds</u>	
<i>Anus spp</i>	Mallard/Pacific Black Duck Hybrid
<i>Carduelis carduelis</i>	European Goldfinch
<i>Columbe livia</i>	Feral Pigeon
<i>Passer domesticus</i>	House Sparrow
<i>Streptopelia chinensis</i>	Spotted Turtle Dove
<i>Sturnus vulgaris</i>	Common Starling
<i>Turdus merula</i>	Common Blackbird

Objectives

Provide the effective control of introduced animals.

Actions

- Determine the extent of introduced animal populations and their relative impact on native flora and fauna.
- Monitor introduced animal populations within the park and undertake pest control programs in accordance with priorities based on their impact to native wildlife.
- If control programs are necessary, work in cooperation with adjoining landowners, Pest Plant and Animal Control Authorities, the City of Mitcham, the Friends of Brownhill Creek and the wider community to achieve effective pest animal control programs.
- Provide interpretive information on the adverse impacts of introduced animals to increase public awareness.

4.3 Cultural Heritage

4.3.1 Aboriginal Heritage

Dreaming

For Aboriginal people, land and waters have many interconnected complex meanings and values. The significance of land and waters is central to Aboriginal people's lives: at birth, death, ceremonies and socially, whilst hunting, gathering camping, and travelling. The term "Dreaming" is the term used to describe the combination of these aspects of life, religion, mythology, law and history which includes the past, the present and the future.

The land or waters that an Aboriginal person has a traditional or contemporary association with is commonly referred to as "Country." Both "Country" and "Dreaming" are complex concepts that are difficult for Non-Indigenous people to understand. For example "Dreaming" can be a site located in song, in physical space or embodied in an object. Its physical, social or psychological importance can vary according to the speaker's traditional country, gender, age and personal experience. For these reasons the "Dreaming" is rarely mapped in the western sense but the significance of a site is integral for Aboriginal people.

Furthermore, mythological sites associated with these stories are known only to the Aboriginal people with cultural knowledge of the area. These sites are often landscape features which can be one or many trees, rocky outcrops, riverbeds or water holes. These sites physically represent the ancestors and their activities in the story with the knowledge and "Dreamings" associated with these sites passed down through stories of travellers, ancestors and mythological beings. Many "Dreaming Stories" travel throughout an area and may be known as a "Dreaming Trail" or "Track". Some stories focus on specific "sacred sites". These stories and traditions exclusively belong to Aboriginal people. Who tells them, where they are told, to whom they are told and when, are all a part of their culture and must be respected.

At present, no Dreaming stories are interpreted within Brownhill Creek Recreation Park, however, according to Cockburn (1984), 'Wirraparinga', is the name given to the creek by the Kaurna Aboriginal people and was the name chosen for the main walking trail through the park.

Aboriginal Occupation

The Kaurna people occupied the land now conserved by Brownhill Creek Recreation Park (Tindale 1974). The environment provided important resources for the Kaurna, and according to the reminiscences by Pastor Finlayson (Finlayson 1902-3), "Brownhill Creek, where it issues from the hills, was a gathering place for Aboriginal people with as many as a hundred and fifty camping there at any one time."

Along with colonial settlement in 1936, came disease, dispersal, and the occupation of land and water supplies, which often resulted in violent conflict. The Kaurna people were progressively dispossessed and their ability to maintain a traditional lifestyle diminished, which led to segregation and the loss of language, traditional stories, ceremonies, significant and sacred sites, hunting and gathering techniques, and many other important cultural and heritage aspects of their lifestyle. Within 50 years of colonial settlement the Kaurna people no longer lived a traditional life close to Adelaide (National Parks and Wildlife SA, 1999).

Today, Kaurna people live on their country and practice their culture and language. Some of the language and traditional stories have been recorded, however, to date the full extent of Aboriginal heritage at Brownhill Creek has not been comprehensively researched. Furthermore, due to historical or cultural reasons, any knowledge of the of the cultural heritage of the region may be privileged to selected Kaurna people and therefore unable to be recorded.

Given the lack of existing information, it is considered important that further research be undertaken in order to gain a better understanding of the Aboriginal occupancy and use of the area.

Aboriginal Heritage Act 1988

The *Aboriginal Heritage Act 1988* defines a site as ‘An area of land that is of significance to Aboriginal tradition, Aboriginal archaeology, anthropology or history.’ Site types include:

- **Archaeological sites, campsites, middens, artefact manufacturing sites.** These may occur in isolation or in conjunction with other sites. These may contain scattered pieces of stone leftover from the manufacture of tools, stone or clay hearths, and food remains such as shellfish or animal bone. Middens are characterised by large deposits of shells. They may also contain animal bone, charcoal, stone tools and possibly skeletal remains.
- **Burial sites.** Can be historic or pre Contact. In some areas burials are marked with stones, logs or brushwood at the head or sides of the grave, however most burial sites are only recognisable when they become exposed by erosion or by disturbance. Many are found in sandy areas where they are readily exposed through erosion.
- **Quarry sites - stone tool, grindstone and ochre quarries.** Quarries can be identified from signs of chipping or hammering on suitable rock outcrops and from associated surface scatters of flaked stone.
- **Stone arrangements- ceremonial, hunting hides, and fish traps.** Arrangements can be made out of stone timber or earth. They are distinguished by large or small arrangements of stones laid out in patterns on relatively clear ground, but can also be found across watercourses as fish traps.
- **Mythological sites.** Mythological sites are dreaming sites. These may include natural features in the landscape, such as single trees, rock formations and waterholes to mountain ranges.
- **Historic sites.** Historic sites can include missions; ration depots, birthplaces and fringe camps.
- **Paintings and engravings.** Painting and engraving sites are widely distributed and are found in a range of environments where suitable rock surfaces, shelters and overhangs are found.
- **Scar trees.** Scar trees exhibit scars on the trunk or limbs where bark has been removed for various purposes to make canoes, shields, dishes or shelters. These are also termed Culturally Modified Trees.

Any land, developed or undeveloped can contain sites. Sites relate to living patterns and use of environmental resources such as water, animal and vegetable foods and stone by Aboriginal people. They also relate to spiritual beliefs, and ceremonial activities.

Certain landforms at Brownhill Creek likely to contain evidence of Aboriginal pre-historic occupation include:

- *Claypans, lakes, creeks and estuaries* (stone artefact scatters, shell middens, rock art, stone arrangements, campsites or ovens)
- *Rocky outcrops* (quarries, rock art, rock holes, stone arrangements, ceremonial religious sites, stone artefact scatters)
- *Bush or forested areas* (stone artefact scatters, campsites or ovens)

The South Australian Government is responsible for the protection and preservation of sites, objects and remains of significance to Aboriginal people. The Department for Aboriginal Affairs and Reconciliation maintains a Central Archive of some 6000 site recordings of Aboriginal sites.

Currently one site is listed on the Central Archive for Brownhill Creek Recreation Park. This site is a scarred tree, commonly referred to as the “Monarch of the Glen”. This recording does not reflect a comprehensive survey of the park. To promote better cultural heritage management at Brownhill Creek Recreation Park further research needs to be undertaken to identify and record sites of significance on the park.

To ensure the protection of sites and to avoid inadvertent damage, DEH shall consult with DAARE and other relevant Aboriginal authorities before commencement of any development works.

Management of Aboriginal sites is largely at the direction of authorised Aboriginal Heritage Committees, constituted under the *Aboriginal Heritage Act 1988*. DEH has, and will continue to, liaise with Aboriginal people with an interest in the area.

4.3.2 Colonial Heritage

Quarrying

According to historic accounts recorded at the Mitcham Heritage Research Centre, the SA Company established the No.1 Sheep Station in 1837 along the Brownhill Creek valley in 1837 until it divested its interest in stock in the early 1840's. This was before any surveying had taken place in the hills and it was not until 1858 that the land appeared on maps as a reserve and formally dedicated as a reserve for public recreation purposes and placed under the control of the District Council of Mitcham.

It was reported in the *Adelaide Independent* newspaper on 28 October 1841 that a specimen of freestone, considered to be of excellent quality, was obtained from a quarry recently opened near Brownhill Creek. This is one of the earliest references to quarrying in the area. A decade later, quarrying near Brownhill Creek provided employment and was set to become a major industry for the district by providing building material, road metal and ballast for the railways and Outer Harbour breakwater for the next 100 years.

In November 1841, one month after the newspaper report, Arthur Hardy, who had purchased a land order in England in 1838, wrote to the surveyor general to take up his land. He was particularly interested in the creek running from the south side of Brownhill, however he was informed "that the reservation of the Brownhill Creek for public purposes not having been abandonedbut is still being the intention of the government to appropriate it to the purposes for which it has been set apart." The public purposes alluded to could have included the potential building stone, water or timber, all necessary commodities for securing settlement in the colony at that time.

Historic accounts indicate that Viney's bluestone quarry, situated on the east side of the road past the caravan park (see Figure 2), once provided a source of especially large blocks for colonial buildings in the nearby Mitcham village, Parkside, Eastwood and no doubt elsewhere. Further up the gully on the south side of the park are the foundations of Mundy's rock crushing plant from which road metal was obtained. To preserve the cultural significance of the bluestone quarry and the rock crushing plant, overgrown introduced species need to be removed and interpretive information provided to explain their significance to visitors.

Parcels of land surrounding Brownhill Creek Recreation Park were originally purchased between 1846 and 1854 by John Grainger, who eventually owned 700 acres, including a quarry situated near the entrance of the park, from which he donated £400 in the form of building stone towards the construction of St Michael's Church in 1848.

Mitcham Council also operated a quarry just west of the Lions Club picnic ground from 1860 to 1911, which provided stone (sandstone and quartzite) for roads and buildings around Mitcham. The site later became a rubbish dump.

Market Gardening

John Grainger leased much of his property to tiersmen, who turned to farming as they cleared the land. Later generations established more profitable market gardens, encouraged by the rich alluvial soils of the of the creek flats.

A letter to the Mitcham Council in 1869 from Mr John Calf brought attention to the quantity of manure that market gardeners were depositing on the reserve. A decision was made to investigate this issue, but it was not until 1891, after being lobbied by concerned gardeners, that Mr Alf Terry, on behalf of the Mitcham Council, built two sets of stone and pug pits to store horse manure used as fertiliser for local market gardens. The manure pits prevented pollution of Brownhill Creek.

Of the several bays of manure pits built by the Mitcham Council, only one set remains, which is now on the State Heritage Register.

Over the years, the Manure Pits were overgrown with introduced species and became structurally unstable. During 2001, the remaining Manure Pits were extensively restored and upgraded by the Friends of Brownhill Creek from a DEH Grant. This involved the removal of introduced plant species, stabilising of pit walls and the erection of an interpretive sign. Due to weathering, vandalism and unintentional damage, the pits will continue to disintegrate. Ongoing suitable protection measures are required to ensure the preservation of this historic installation.

Brownhill Creek Chapel

The only community building to be constructed in the Brownhill Creek area was the Brownhill Creek Chapel, built outside the park boundary at the junction of Tilley's Hill and Brownhill Creek Roads. The Chapel was built in 1874 as a branch of the Mitcham Baptist Church. Mrs Joseph Grigg, as one of the oldest residents in Brownhill Creek at the time, had the honour of installing the foundation stone. From 1893, the chapel was used as a school for children who lived on the market gardens. The building was then used as a private home until 1942 when it was burned down in a bushfire and vandalised, leaving only the foundation stone. Until recently the remnant stone was located to the base of the old gum tree known as the Monarch of the Glen, but it has recently been removed.

Monarch of the Glen

The Monarch of the Glen is a giant river red gum, estimated to be over 400 years old, situated in the caravan park. When the first pioneering families came to live in Brownhill Creek the inside of the trunk had already been burnt out, suggesting that it was probably occupied by the Kaurna Aboriginal people. Settler families who camped near the creek used the hollow trunk as a temporary home and several early settlers gave birth within the hollow trunk.

At present, the Monarch to the Glen is obscured by several caravan sites and is not readily visible from the road. For visitors to appreciate the significance of the historic gum, surrounding caravan sites will need to be relocated.

Public Swimming Baths

Brownhill Creek was frequently used for bathing during the hot summer months and in 1893 a portion of the Brownhill Creek Reserve was dammed and dedicated for the purposes of public swimming baths. However, Mitcham Council minutes of 1 December 1902 record complaints by market gardener T Newey that the baths were interfering with the natural flow of the creek and market gardening operations. The council resolved that "all dams on the creek be destroyed and no further bathing allowed." This led to the closure of the public swimming baths and in 1912 the land grant was cancelled (see Appendix B).

Brownhill Creek Road and White's Bridge

The road that dissects the park can be traced back to a letter received by the Mitcham Council in 1869 from quarry owner and resident H Mundy asking permission to cut a road through the reserve to his house. The request was approved and a formal road was constructed.

White's Bridge, as it is referred to by local residents, was originally a wooden colonial structure until 1919, when Mitcham Council received a government grant to build a new reinforced concrete bridge with the contribution of local rate payers, making it one of the earliest such structures in South Australia. In the late 1990's, the reinforced concrete sidewalls and posts were removed and replaced with metal highway railing (see 4.6.2 Vehicle Access).

Stone Monument and Drinking Fountain

Other historic items include the stone memorial located at the entrance of the park, where a hanging sign displaying the name of the park originally swung. A plaque remains declaring Brownhill Creek Reserve a National Pleasure Resort on 15 July 1915. Furthermore, an historic drinking fountain, installed after water reticulation in 1880, remains in the northern side of the park.

With the support of the Heritage branch of DEH and the Mitcham Heritage Research Centre, research to reinstate these items will need to be conducted.

Objectives

Conserve significant archaeological, cultural or historical sites and provide suitable interpretive material.

Actions

- Consult Kurna people who have a traditional association with the land, Native Title Claimants and relevant State and Federal Aboriginal heritage authorities, in decisions regarding the management of Kurna cultural heritage.
- Before proceeding with any development works within the reserve, obtain an assessment and clearance from the appropriate authority, under the provisions of the *Aboriginal Heritage Act 1988*.
- Identify, record, protect, restore and monitor known or relocated sites and items of archaeological, anthropological, cultural and historical significance located in the park, in cooperation with the Department for Aboriginal Affairs and Reconciliation, the Heritage branch of DEH and other relevant authorities and organisations. Kurna and historic cultural heritage sites require conservation plans to facilitate appropriate management.
- In consultation with the Kurna community, the Heritage branch of DEH and other relevant authorities, research and inventory, cultural and historic sites and stories that relate to the park and where appropriate, develop interpretive material, including cultural heritage themes, to increase public awareness. Interpretive material may include brochures, site signage and displays.
- Encourage and support archaeological, anthropological and historic studies within the park. All sites located should during these surveys should be recorded to the standards set by the Heritage branch of DEH and/or DAARE and submitted for inclusion on the DAARE Central Archive and/or State Heritage Register.
- Negotiate with the caravan park lessee to relocate caravan sites that obscure the Monarch of the Glen.

4.4 Fire Management

Background

Fire management mechanisms are a necessary component of park management considering the park's relative location to neighbouring properties and residential areas, and considering that much of the terrain is well vegetated.

Most fires in the park have been started illegally. Fires are not permitted in the park and only gas barbecues may be used except on total fire ban days when all types of fire including gas barbecues are prohibited. On days of extreme fire danger, the park may be closed to the general public.

Some fires in the park have been started by timber falling on powerlines from over hanging trees. Trees adjacent to powerlines that are likely to collapse or cause interference should be removed or maintained to prevent the incidence of fire (see 4.8.1 Electricity, Telecommunications and Water). Fires have also been caused by stolen cars being dumped in the park and burnt out. This has been significantly reduced by regular security patrols conducted during summer. This initiative is funded by local government and should be encouraged to continue. To assist local government patrols and to deter people from entering the park at night, a clear sign should be erected at the entrance of the park to indicate the park's closure at dusk to the general public.

Park staff conduct an annual bushfire prevention program that involves slashing and prescribed burning which is used as a management tool to strategically manage fuel loads. A Fire Management Statement will be prepared in consultation with adjoining Country Fire Service Groups and Bushfire Prevention Committees to integrate district fire prevention efforts. The statement will contain a detailed park description, fire prevention information, pre-planned fire suppression objectives and strategies.

To coordinate district fire prevention, the City of Mitcham has prepared the Mitcham Bushfire Prevention Plan, which has resulted in the removal of highly flammable introduced species and the establishment and maintenance of firebreaks on land controlled by the City of Mitcham. Cleared areas are inspected regularly for regrowth and combined with the establishment of native indigenous species to reduce the infestation of exotic flammable plants.

According to Gill, Groves and Noble (1981), fire is one of the most important natural environmental variables in determining the structure and composition of Australian vegetation, and maintaining biodiversity conservation. For DEH to use fire as an active ecological management tool, research must be conducted into developing a general understanding of the fire ecology of an area and to determine if fire is necessary or beneficial for biodiversity conservation in Brownhill Creek. Research should address issues such as frequency, timing and size of fires, impact to neighbouring properties and residential areas and the effect of fires on biodiversity values of the area.

Objectives

Prevent the threat of wildfire and protect lives and property within and surrounding the park.

Actions

- Comply with provisions of the *Country Fires Act 1989* and the Mitcham Bushfire Prevention Plan.
- Continue to conduct annual fire prevention works.
- Develop and implement a Fire Management Statement, in collaboration with the Country Fire Service and Bushfire Prevention committees that specifies annual fire prevention works, bushfire control procedures and monitoring, to integrate district fire prevention efforts.
- Ensure visitors comply with fire restrictions and fire ban season between December 1 and April 30, by monitoring visitor use.
- Encourage local government to continue regular security patrols through the park at night, to prevent the incidence of fire caused by stolen cars being dumped in the park and burnt out.
- Consider the use of fire as a management tool if research indicates that it is necessary for biodiversity conservation.

4.5 Recreation and Tourism

4.5.1 Visitor Use

Brownhill Creek Recreation Park provides a range of recreational settings for day visitors or overnight stays at the Brownhill Creek Caravan Park. The park is popular with nearby urban residents and other visitors who enjoy the walking trails, cultural and historic features, nature study opportunities and the Lions Club picnic ground. Visitors to the caravan park can utilise the tennis courts, swimming pool and children's play equipment.

According to the Caravan park operator, Brownhill Creek Recreation Park receives approximately 30-40 000 visitors per year, with the majority of park visitors from South Australia. The most popular times are on weekends, with the caravan park receiving high visitation during the Easter and October long weekends, and the Christmas holiday period.

4.5.2 Vehicle Access

Visitors may enter the park by vehicle from Brownhill Creek Road. From Adelaide, head south along Fullarton Road, turn right at Taylors Road and then left into Brownhill Creek Road. A narrow bitumen road provides conventional vehicle access into the park and low level parking facilities are located throughout the park.

If the road were used exclusively for park access, DEH would close the road to through vehicular traffic except for bikes, horses, and walkers but retain the road for maintenance of park infrastructure and emergency purposes only. However, it is recognised that Brownhill Creek Road is the only through road to approximately 30 properties in the City of Mitcham and that residents and those servicing these homes require ongoing access through the park.

In the past, maintenance and minor works on Brownhill Creek Road have been undertaken by DEH, with City of Mitcham also undertaking minor patch up work when required. In its present condition, the road requires urgent attention and a safety audit has been commissioned. It is proposed that for all future maintenance and repairs, an arrangement between the City of Mitcham and DEH, based on proportional use, is required.

In the 1980's, the road passed through the centre of the caravan park. To increase safety for caravan park residents, DEH funded the construction of an access road for private residents to bypass the caravan park. While this alleviated the danger for caravan park residents, other park users including pedestrians and vehicle traffic share Brownhill Creek Road, and the only access across the creek is over a narrow bridge. Pedestrian and vehicle traffic simultaneously using the road and bridge is dangerous, with several near miss instances reported.

In order to improve visitor safety and accessibility through the park, DEH will investigate options for the construction of improved visitor access, designed according to current wheelchair specifications.

The speed limit is restricted to 30 kph adjacent to the caravan park, then increases to 40 kph through the remainder of the park, but visitors continue to exceed this limit, creating safety concerns for other park users. DEH will investigate options and undertake measures to prevent speeding, including the erection of speed limit signs at strategic locations. Other options may include the use of chicanes, speed humps, speed cameras and if possible the assistance of increased Traffic Police monitoring.

Existing parking and the suitability of bollards need to be assessed and improved to meet current visitor requirements. The bollards and logs that currently define carparks have, on several occasions, been removed by vandals, resulting in soil erosion and vegetation damage. Planting trees and shrubs to provide natural barriers could enhance the effectiveness of bollards.

Objectives

Provide and maintain safe, functional access facilities for park visitors, management purposes and neighbouring residents.

Actions

- Continue to consult with the City of Mitcham concerning vehicle access and road management.
- Negotiate an agreed funding arrangement with the City of Mitcham for the reconstruction and ongoing maintenance of Brownhill Creek Road.
- Investigate options and implement measures to reduce speeding and improve safety standards.
- Investigate an alternate access for visitors that complies with current Australian standards.
- Assess the suitability of bollards to prevent off road damage and investigate alternative options.
- Provide additional carpark facilities where appropriate to support visitor numbers.

4.5.3 Walking and Multi-Use Trails

Walking trails of varying lengths provide visitors with an opportunity to explore the park. The Wirraparinga Trail is the only formal walking trail established in the park, while informal short trails are provided to features of interest. In 2001, the trails were closed after a Risk Assessment was undertaken by DEH staff. Several limitations and safety issues were identified with the existing walking trail network and it is necessary to develop a detailed trail plan to address some of these problems and improve the overall standard of walking trails within the park.

Existing track surfaces are reasonable but are often impinged by overgrowing vegetation, have loose surface material and in some places there is evidence of erosion. For ease of use and visitor safety, the walking trails require improvement and ongoing maintenance.

An increase in the number of visitors utilising the park for mountain bike riding has resulted in accelerated track erosion in recent years. This activity often conflicts with the enjoyment and safety of walkers and, while mountain bike riding is prohibited within the park, it is difficult to regulate.

Ongoing consultation with the community, Bicycle SA, the Office for Recreation and Sport and other relevant stakeholders, will help overcome these problems and identify opportunities for recreational cycling through the park. It will also facilitate the creation of appropriate links where regional cycling trails exist.

In Brownhill Creek, a comprehensive solution may lie in the development of a multi-use trail that allows mountain bike and horse riding, but which also incorporates environmental protection and public safety features.

The development of a multi-use trail would be in accordance with the provisions of the *State Mountain Bike Plan for South Australia, Mount Lofty Ranges Region 2001 – 2005*, which promotes a coordinated approach between Government and industry for the development of integrated and sustainable mountain bike opportunities. The plan aims to provide a network of legal cycling opportunities, utilising existing trails, where appropriate, and providing new opportunities for cycling and shared trail use through best practice techniques for trail location, design, management and use.

Existing walking trails also fail to connect features of interest. The suggested route for a multi-use trail has been designed with the Friends of Brownhill Creek to improve access to features of interest and to provide opportunities to interpret these for visitors (Figure 4). The proposed route incorporates a small section of the Wirraparinga Trail from the manure pits to the carpark at the eastern end of the park. This section of the Wirraparinga Trail is not connected with the main trail and would merge with the proposed multi-use trail (see Figure 4).

The proposed route will be subject to a risk assessment, and if determined to be unfeasible, with regard to environmental protection, public safety and ongoing maintenance costs, the suggested route could be developed into a formal walking trail with horse and mountain bike riding prohibited.

To complement trails within the park, the Greater Mount Lofty Parklands Initiative, “Yurrebilla”, aims to rationalise and integrate trails between Brownhill Creek Recreation Park and other parks in the parkland network. This will provide increased opportunities for the community to access a diverse range of recreational, educational and cultural activities. The provision of additional visitor facilities (eg carparks) for any increase in visitation will also be assessed and implemented if deemed necessary (see also 5.4.2 Vehicle Access).

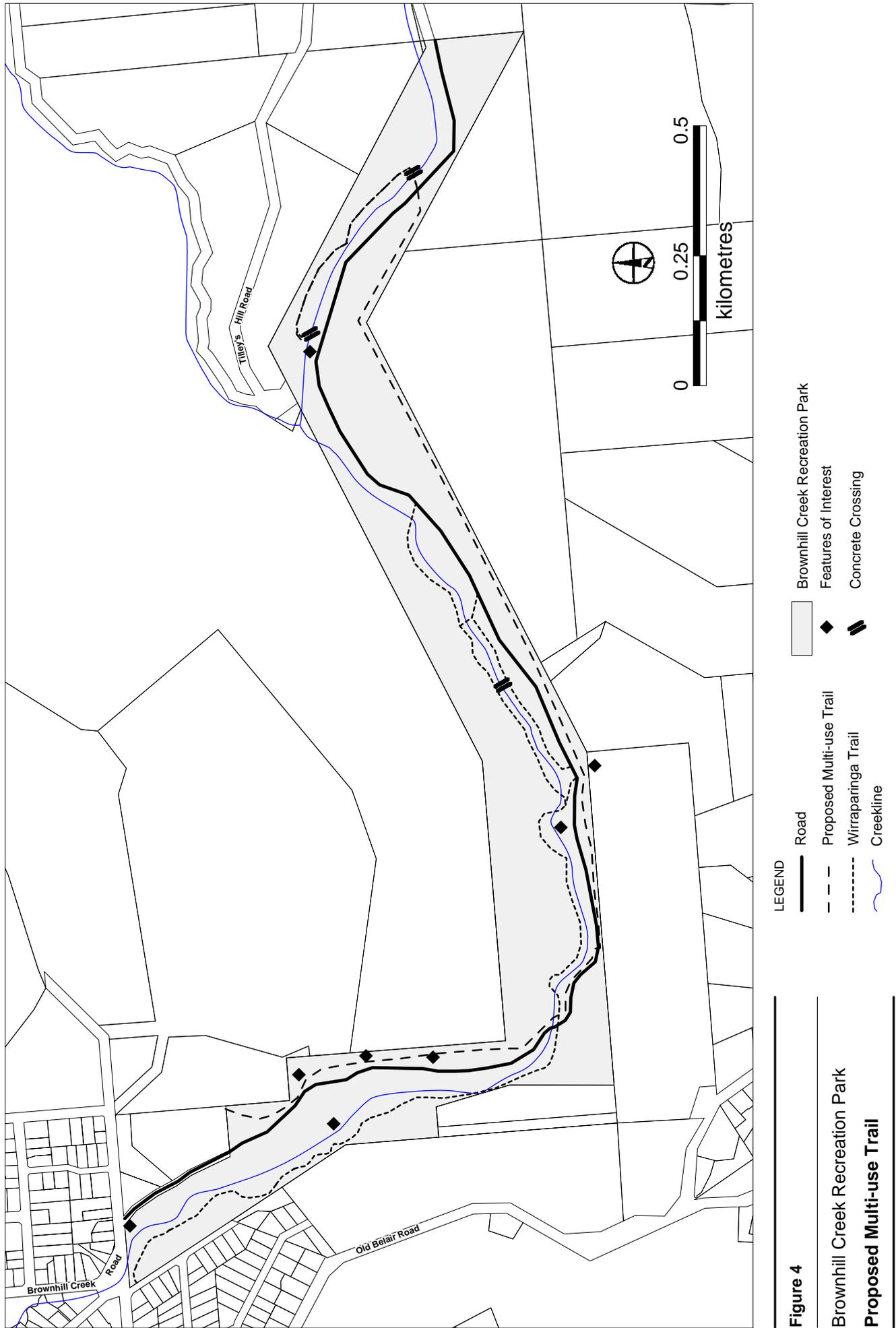
For the time being, mountain bike and horse riding will continue to be prohibited on existing walking trails.

Objectives

Provide safe access trails that are integrated with regional trails and which provide opportunities for visitors to explore the natural and cultural assets of the park, without adversely impacting sensitive areas.

Actions

- Develop and implement a detailed trail plan for the park that complies with all OHSW issues and policies.
- Establish a trail maintenance program and provide clearly defined, safe trails for visitors.



- In consultation with Bicycle SA and Office for Recreation Sport & Racing, conduct a risk assessment and if deemed feasible;
 - investigate options for the development of a multi-use trail that uses best practice techniques for visitor safety and environmental protection.
 - designate the eastern end of the Wirraparinga Trail from the manure pits to the car park as part of the proposed multi-use trail.
- Develop and incorporate interpretive information at places of interest along trails.
- Identify appropriate interpretive themes and arrange for the development of trail-head and trail-side interpretive and directional signs where appropriate.
- Facilitate the connection of internal park trails with the regional trail network and liaise with adjoining landowners to investigate the possibility of future linkages.
- Monitor visitor numbers and if necessary provide additional visitor facilities (eg carparks etc) to accommodate demand.

4.5.4 Horse-Riding and Horse Arena

An informal horse arena has been established in the park to provide an area for local residents to exercise their horses. Prior to being a horse arena, the area was subject to severe soil erosion caused by irresponsible off road driving. Rather than allowing this uncontrolled activity to continue, local residents in conjunction with DEH fenced the area for local horse riders.

Members of the Friends of Brownhill Creek and local community who use the arena are committed to the removal of manure, weed control and screen plantings to prevent soil erosion and to create an area where drums and rails are hidden.

To encourage compliance with park policy on horse riding, one solution that has been successful in other parks, is the development of a code of practice for horse riders, jointly developed between DEH, Office for Recreation Sport & Racing, Horse SA and local riders. The code of practice will include a methodology for the removal of horse manure and the confinement of horses to designated areas. The construction of a multi-use trail would also encourage riders to avoid sensitive areas (see 4.5.3 Walking Trails).

Another issue raised is the location of the horse arena in relation to the watercourse and the increased likelihood of water pollution caused by manure. If poorly managed, the nutrients in manure can be a major source of watercourse pollution and although the horse riders are committed to the removal of manure, this should be monitored. The impact of soil erosion and soil compaction on the watercourse should also be investigated. DEH needs to monitor the impact of horses using the arena and if necessary relocate the horse arena outside the park.

Objective

Provide for the continuation of horse riding within the park within an agreed code of conduct and management framework.

Actions

- Develop and implement an agreed horse riding code of conduct between DEH, Office for Recreation Sport & Racing, Horse SA and local riders.
- Prohibit horse riding off designated tracks to avoid sensitive areas and minimise environmental impact.
- Monitor the impact of horses on the watercourse and investigate the feasibility of relocating the horse arena to a more suitable location if necessary.
- Encourage and support the continued commitment of the Friends of Brownhill Creek and local riders to minimise the impact of horses and the horse arena.

4.5.5 Day Visit Areas

Background

The Lions Club picnic ground provides picnic tables and a maintained lawn, attracting a range of visitors including families, bushwalkers and organisations who hold annual functions.

Annual functions within and outside the Lions Club picnic ground are subject to an application approval and specific conditions. To minimise problems in relation to noise, boisterous activity, excessive drinking and environmental damage caused by individuals attending a function, DEH will retain the option to decline future applications by the offending organisation.

Public facilities supplied by DEH are minimal and the demand for improved day visit facilities, particularly access to toilets has been raised. However, the cost of establishing facilities and the high incidence of vandalism has made DEH reluctant to create sites that may prove costly to maintain. There are limited departmental resources allocated to Brownhill Creek, but in partnership with the community and other agencies, the provision of quality visitor facilities, including access to toilets could be negotiated.

Objectives

Provide day visit facilities for visitors that offer an enjoyable experience without compromising the conservation of natural values.

Actions

- Monitor functions held within and outside the Lions Club picnic ground and if, in the opinion of DEH, behaviour becomes unacceptable (in terms of environmental damage or unacceptable social disturbance), DEH reserves the right to decline future applications.
- Continue the existing arrangement with the Lions Club to maintain the picnic grounds.
- Investigate options and negotiate partnership arrangements with interested stakeholders in the development and maintenance of visitor facilities and access to toilets for park users.
- Consider the provision of additional facilities based on visitor demand, and implement subject to available resources and statewide priorities.
- Maintain adequate visitor facilities that comply with Hills Face Zone principles.

4.5.6 Interpretive Information

Interpretive information has been limited to the provision of relatively low key signs identifying the park at the main entrance on Brownhill Creek Road and displaying appropriate behaviour in the park.

Information signs are located at some features of interest and directional signs are placed at strategic locations along the Wirraparinga Walking Trail.

Brochures are available from the District Office at Belair National Park, the Environment Shop (77 Grenfell Street, Adelaide). Information may also be obtained from the ParksWeb internet site <http://www.parks.sa.gov.au/>.

The development of an integrated interpretation approach is needed to convey information regarding the historic, cultural and natural features of the park, pest animals and plants, the impacts of inappropriate behaviour and the need to minimise access to sensitive vegetation and wildlife habitat. This can be integrated with walking trail development, to enable visitors to walk to various features of interest throughout the park.

Objectives

Provide information to visitors to enhance their visit and to regulate behaviour that might compromise natural values.

Actions

- Develop, implement and maintain up to date interpretive information, including brochures, signs and interpretive panels that:
 - convey orientation and basic facility information;
 - highlight special values and features of the park;
 - convey information on introduced plants and animals;
 - include visitor safety information;
 - indicate acceptable behaviour.
- Integrate walking trail development with interpretive information.

4.6 Commercial Activities and Other Landuse

4.6.1 Caravan Park and Campground

Background

Caravan and camping facilities are available in the Brownhill Creek Caravan Park and include a kiosk, toilet/shower/laundry complex, swimming pool, playground equipment, tennis court and barbecues. While some facilities, including the tennis courts and swimming pool, are available exclusively to caravan park patrons, access to historic features situated within the caravan park, including the Monarch of the Glen, is open to the general public. The kiosk also serves members of the public during operation hours.

Brownhill Creek Caravan Park occupies a significant portion of the park and is popular with visitors. To ensure caravan park facilities are maintained and operation is consistent with the natural and historic values of the park, DEH need to maintain ongoing liaison with the lessee and regularly review lease conditions.

During the term of the current lease agreement, DEH had developed a policy relating to new developments which stated that all new infrastructure must comply with Hills Face Zone Principles. This will continue to apply to all new developments within the park and DEH will encourage the current lessee to upgrade caravan park facilities, when required, in an aesthetic manner that is sympathetic to the local environment.

Objectives

Maintain the operation of Brownhill Creek Caravan Park within an agreed lease agreement and management framework, that is mutually beneficial to all parties.

Actions

- Monitor and regularly review lease conditions as required to ensure their operation is consistent with the natural and historic values of the park.
- Maintain ongoing liaison with the lessee of the Brownhill Creek Caravan Park.
- Encourage the sensitive upgrade of caravan park facilities to comply with Hills Face Zone principles.

4.6.2 Electricity, Telecommunications and Water

Background

There are numerous easements for power, water and telecommunication utilities throughout the park. Underground telephone cables follow the road and electricity services are both underground and on overhead poles. Trees that interfere with overhead power lines can create a fire hazard and DEH need to ensure they are removed and maintained by ETSA utilities.

Furthermore, there is potential for park maintenance work damaging services and equally there is potential for park values to be degraded by maintenance work conducted by utility companies. To avoid this, DEH need to maintain liaison with utility managers to ensure that maintenance or development works do not interfere with utility services or impact on park values.

Objectives

Ensure that the operation and maintenance of utility services within the park does not compromise park values.

Actions

- Maintain accurate records of underground and overhead services to minimise damage through park maintenance and development work.
- Maintain liaison with utility companies and periodically review maintenance programs.
- Ensure that trees adjacent to power lines are pruned regularly to minimise bushfire risk.
- Investigate the potential for power to be routed exclusively underground, perhaps as part of the road upgrade (see Vehicle Access 4.5.2).

4.7 Management Arrangements

4.7.1 Partnerships and Cooperative Management

Background

The Department for Environment and Heritage supports and promotes partnerships and cooperative management arrangements to establish integrated natural resource management. This requires the development of substantial working relationships with government agencies, local authorities and local communities.

With regard to Brownhill Creek Recreation Park, this requires ongoing management links with the City of Mitcham, PCWMB, Native Title Claimants, the representative Aboriginal Heritage Committee as nominated by the State Aboriginal Heritage Committee, Office for Recreation Sport & Racing and key community stake-holders. DEH also recognises the importance of participating in regional management programs and contributing to community organisations and boards including, Landcare groups, Soil Conservation Boards and Animal and Plant Control Boards.

Partnership arrangements should be developed to provide a positive direction for the shared development, maintenance and management of the park and to improve the resourcing and funding capability to manage the park in accordance with the objectives of this plan.

City of Mitcham

Brownhill Creek Recreation Park is in the City of Mitcham Council electorate and bordered on the west and south sides by residential properties, rural land use on the east and a council reserve on the north. DEH and the City of Mitcham share ongoing land and road management issues, with access provided to several properties through the internal road that dissects the park and with the management of the council reserve adjacent to the park.

DEH and City of Mitcham may benefit from cooperative management or partnership arrangements on matters of common interest relating to integrated natural resource management and road maintenance to ensure safety for park visitors and nearby residents that commute daily through the park.

Patawalonga Catchment Water Management Board

The park benefits from the environmental restoration of Brownhill Creek conducted by the PCWMB, who have developed demonstration sites to improve catchment management and water quality within the reserve. To facilitate integrated natural resource management throughout the catchment, DEH recognises the importance of developing ongoing partnership arrangement with officers of the PCWMB and participating in regional catchment management programs.

Aboriginal Partnerships

DEH is committed to reconciliation and to the development of partnerships with the Kurna community to effectively manage parks and wildlife in a way that respects contemporary and traditional culture, knowledge and skills. Partnerships involve the delivery of programs that promote reconciliation, cultural awareness, Indigenous employment and training, cooperative management and Indigenous cultural heritage management in parks.

Furthermore, the South Australian Government is keen to pursue Indigenous Land Use Agreements (ILUAs) which are voluntary agreements between native title groups and other people about the use and management of country. For Brownhill Creek Recreation Park such agreements would be between the Kurna Meyunna Aboriginal Heritage Committee for the land comprising the park and the South Australian Government.

Objectives

Support partnerships and/or working relationships with organisations, statutory bodies and others to assist with the management of the park and help fulfil the reserve's potential without compromising its natural values.

Actions

- Continue to consult with the City of Mitcham, the PCWMB, and other relevant bodies to explore the benefits of partnership arrangements that will support future management decisions on issues of common interest.
- Encourage and contribute to the development of partnership arrangements, to integrate biodiversity and recreation management in the Mount Lofty Ranges, with organisations that have an interest in contributing to the sustainable management of the park.
- Involve the Kurna Heritage Committee as nominated by the State Aboriginal Heritage Committee, in the cooperative management of the reserve and their Indigenous cultural heritage.

4.7.2 Community and Volunteer Involvement

Volunteer support and community based involvement that conserves and improves biodiversity and cultural values, and establishes quality management of recreational use is an essential component of park management.

The Friends of Brownhill Creek Recreation Park have been involved in ongoing park support programs. Their achievements include:

- flora and fauna surveys;
- weed removal and ongoing control;
- planting trees and shrubs grown from seed collected and cared for by members;
- erosion control, revegetation and rehabilitation, including significant grey box areas;
- encourage and coordinate community volunteer programs;
- walking trail construction and maintenance;
- restoration of the manure pits; and
- participation in the annual Waterwatch catchment program and frog census.

This volunteer contribution has been invaluable and DEH gratefully acknowledge their dedication and enthusiasm. It is important for DEH to consult with Friends members and provide continuous support and assistance including legal and policy advice, technical, planning and management direction.

Other community programs, organisations and individuals, including Urban Forest Biodiversity Program, local schools, Scout groups and adjoining property owners, contribute to restoration, revegetation and weed control projects that support park management.

Volunteers often require the provision of materials, equipment and supervision by park staff. Therefore, it is important for DEH to maintain liaison with volunteers to provide support and encouragement, and to ensure their efforts are consistent with park management objectives and work programs.

DEH recognises that an integrated approach to coordinate priorities for conservation in consultation with the Friends of Brownhill Creek, adjoining property owners and other volunteer organisations and individuals is required.

Objectives

Encourage and support the involvement of the local community, volunteer organisations and individuals in the development of conservation programs in collaboration with DEH.

Actions

- Support and encourage the Friends of Brownhill Creek Recreation Park and other suitable volunteers to continue their voluntary contribution to park management.
- In consultation with the Friends of Brownhill Creek Recreation Park and other major volunteer groups, review the direction of work activities based on the initiatives outlined in this plan of management and the *Brownhill Creek Recreation Park Vegetation Management Plan* (Kinnear *et al* 2001).
- In consultation with the Friends of Brownhill Creek, integrate annual work programs of the Friends Group into the proposed DEH management programs for the reserve.
- Provide additional training opportunities for the Friends Group based upon a mutual recognition of needs.
- Encourage and facilitate the involvement of schools and universities in research and volunteer programs.
- Encourage neighbouring property owners to coordinate revegetation and weed removal efforts with park programs.

4.8 Future Directions

4.8.1 Additional Land

Background

The *National Pleasure Resorts Act 1914* was repealed by the passing of the *National Parks and Wildlife Act 1972* and all land vested in the Minister for *National Pleasure Resorts* was transferred to the Minister for National Parks.

Allotment 83 is an adjoining parcel of land that was once included in the Brownhill Creek National Pleasure Resort but not dedicated in the Brownhill Creek Recreation Park proclamation. The parcel is still registered under the ownership of the Minister of Crown of National Pleasure Resorts.

Allotment 83 covers 6.4 hectares, is undulating to very steep with two small creeks running in a north south direction. A major weed control program would be required to eradicate major weed infestations including olive, pine and boneseed.

Native vegetation includes eucalyptus and acacia species along the ridges, and the Friends of Brownhill Creek have identified and compiled a list of native species that occur, including species of conservation significance.

To be dedicated as part of the park, Allotment 83 will undergo a detailed biodiversity assessment under the CARRS (Comprehensive Adequate Representative Reserve System) principles. Scientific criteria assessed includes site condition, habitat quality, threatening processes, threatened species and communities, an assessment of gaps in the existing reserve system, IBRA regions (Interim Biogeographic Regionalisation for Australia) and Environmental Associations.

A formal strategic investigation will also be conducted including management issues, social and economic values, integration with and locality to other reserves, to determine its suitability for inclusion.

Objectives

Achieve maximum biodiversity conservation and optimal reserve boundaries for management purposes.

Actions

- Conduct a CARRS assessment and detailed investigation of the suitability of including land in allotment 83 in the hundred of Adelaide, previously included in Brownhill Creek National Pleasure Resort, but omitted from the dedication of Brownhill Creek Recreation Park.
- Any review for additional land will be based on both strategic and biodiversity perspective's.
- Any sections added to the park will be managed in accordance with this management plan.
- Investigate options for appropriate use of Allotment 83 if strategic and biodiversity assessment determines it is not suitable or inclusion in the park.



Figure 5
 Brownhill Creek Recreation Park
 Additional Land

LEGEND
 — Road
 ~ Creekline
 [Stippled Box] Allotment 83

5 SUMMARY OF MANAGEMENT ACTIONS

ACTION	PRIORITY	DURATION
Zoning		
Designate and adopt the zones as shown on Figure 3.	High	Short
Natural Resources		
Geology, Soils and Landform		
Assess soil type and properties, including erosion potential, when planning for visitor access or undertaking management activities and development works.	High	Short
Permit bicycle and horse riding on designated tracks only and restrict access to sensitive areas by erecting appropriate barriers.	High	Ongoing
Provide and update interpretive material to encourage visitors to use existing walking trails and to avoid erosion-prone areas.	Medium	Occasional
Identify existing areas of erosion and undertake remedial work that includes natural regeneration, revegetation and pest plant removal, in accordance with the <i>Brownhill Creek Recreation Park Vegetation Management Plan</i> (Kinnear <i>et al</i> 2001).	High	Occasional
Improve, repair and maintain walking trails to stabilise soil as required.	High	Ongoing
Hydrology		
Participate in regional catchment management programs in partnership with the PCWMB to minimise negative impacts to the Brownhill Creek catchment.	High	Ongoing
Collaborate with the PCWMB to identify and repair existing areas of erosion through coordinated revegetation and pest plant eradication programs, in accordance with the <i>Brownhill Creek Recreation Vegetation Management Plan</i> (Kinnear <i>et al</i> 2001).	High	Occasional
Continue to encourage and support the involvement of the Friends of Brownhill Creek and other volunteers in revegetation programs and the monitoring of water quality.	High	Ongoing
Continue to support the environmental restoration of Brownhill Creek and manage the terrestrial areas of the reserve in a manner that positively contributes to water quality in Brownhill Creek.	High	Ongoing
Contribute to and support flood mitigation schemes outlined in the <i>Brownhill Creek and Environs Action Plan - Technical Report No.4 Flood Management</i> (PCWMB <i>et al</i> 1998).	High	Ongoing

ACTION	PRIORITY	DURATION
Native Vegetation		
Assess natural regeneration, identify rehabilitation priorities and integrate weed control programs according to recommendations in the <i>Brownhill Creek Vegetation Management Plan</i> (Kinnear <i>et al</i> 2001).	High	Ongoing
Implement the <i>Brownhill Creek Vegetation Management Plan</i> (Kinnear <i>et al</i> 2001) to effectively protect and enhance native vegetation and species of conservation value.	High	Ongoing
Record on a database with GIS capability, the location and distribution of existing and newly discovered plants or habitats of conservation significance, monitor their populations and implement species management programs if necessary.	Medium	Ongoing
Support and encourage the Friends of Brownhill Creek and other volunteer organisations and individuals, to continue revegetation programs and to assist with monitoring species of conservation significance in collaboration with DEH.	High	Ongoing
Encourage and participate in ongoing maintenance of the PCWMB demonstration site and support the establishment of future sites.	High	Ongoing
Native Fauna		
Encourage approved volunteer groups and individuals to conduct fauna surveys and population monitoring.	Medium	Ongoing
Record on a database with GIS capability, animal species and habitats, including opportunistic sightings of rare and endangered fauna, and monitor these populations to ensure their conservation.	Medium	Ongoing
Identify and protect significant fauna habitats/food requirements and integrate habitat restoration with native revegetation efforts and weed management programs.	High	Ongoing
Investigate opportunistic sightings to verify species identification.	Medium	Occasional
Introduced Plants		
Fulfil the obligations of the <i>Animal and Plant Control (Agricultural Protection and Other Purposes) Act 1986</i> within allocated resources.	High	Ongoing
Encourage the development of and contribute to integrated regional weed control programs that will establish pest plant control priorities and actions, and combine weed control with native revegetation efforts.	High	Ongoing
Implement the <i>Brownhill Creek Recreation Park Vegetation Management Plan</i> (Kinnear <i>et al</i> 2001), which sets long-term, achievable, measurable goals and includes programs for coordinated pest control, land rehabilitation and revegetation.	High	Ongoing
Investigate the replacement of the remaining Seven Sisters commemorative plantings with seven red gums to commemorate the Centenary of Federation.	Medium	Short

ACTION	PRIORITY	DURATION
Provide adequate protection for significant trees and collaborate with the Heritage branch of DEH, Mitcham City Council and others to identify trees considered significant under the <i>Development Act 1993</i> and/or the <i>Heritage Act 1993</i> .	High	Ongoing
Provide interpretive information on the adverse impacts of introduced plants to increase public awareness.	Medium	Short
Investigate the potential for alternative funding for weed management.	High	Short
Stage the removal of Aleppo Pines (<i>Pinus halepensis</i>) in coordination with revegetation programs using native food species Dwarf Hakea (<i>Hakea rugosa</i>) and/or Elm-seed Hakea (<i>Hakea cycloptera</i>) for the Yellow-tailed Black Cockatoo.	High	Moderate
Introduced Animals		
Determine the extent of introduced animal populations and their relative impact on native flora and fauna.	Medium	Ongoing
Monitor introduced animal populations within the park and undertake pest control programs in accordance with priorities based on their impact to native wildlife.	Medium	Ongoing
If control programs are necessary, work in cooperation with adjoining landowners, Pest Plant and Animal Control Authorities, the City of Mitcham, the Friends of Brownhill Creek and the wider community to achieve effective pest animal control programs.	Medium	Ongoing
Provide interpretive information on the adverse impacts of introduced animals to increase public awareness.	Medium	Short
Cultural Heritage		
Consult Kurna people who have a traditional association with the land, Native Title Claimants and relevant State and Federal Aboriginal heritage authorities, in decisions regarding the management of Kurna cultural heritage.	High	Ongoing
Before proceeding with any development works within the reserve, obtain an assessment and clearance from the appropriate authority, under the provisions of the <i>Aboriginal Heritage Act 1988</i> .	High	Short
Identify, record, protect, restore and monitor known or relocated sites and items of archaeological, anthropological, cultural and historical significance located in the park, in cooperation with the Department for Aboriginal Affairs and Reconciliation, the Heritage branch of DEH and other relevant authorities and organisations. Kurna and historic cultural heritage sites require conservation plans to facilitate appropriate management.	High	Ongoing
In consultation with the Kurna community, the Heritage branch of DEH and other relevant authorities, research and inventory, cultural and historic sites and stories that relate to the park and where appropriate, develop interpretive material, including cultural heritage themes, to increase public awareness. Interpretive material may include brochures, site signage and displays.	Medium	Ongoing

ACTION	PRIORITY	DURATION
Encourage and support archaeological, anthropological and historic studies within the park. All sites located should during these surveys should be recorded to the standards set by the Heritage branch of DEH and/or DAARE and submitted for inclusion on the DAARE Central Archive and/or State Heritage Register.	Medium	Ongoing
Negotiate with the caravan park lessee to relocate caravan sites that obscure the Monarch of the Glen.	High	Short
Fire Management		
Comply with provisions of the <i>Country Fires Act 1989</i> and the Mitcham Bushfire Prevention Plan.	High	Ongoing
Continue to conduct annual fire prevention works.	High	Ongoing
Develop and implement a Fire Management Statement, in collaboration with the Country Fire Service and Bushfire Prevention committees that specifies annual fire prevention works, bushfire control procedures and monitoring, to integrate district fire prevention efforts.	Medium	Short
Ensure visitors comply with fire restrictions and fire ban season between December 1 and April 30, by monitoring visitor use.	High	Ongoing
Encourage local government to continue regular security patrols through the park at night, to prevent the incidence of fire caused by stolen cars being dumped in the park and burnt out.	High	Ongoing
Consider the use of fire as a management tool if research indicates that it is necessary for biodiversity conservation.	Medium	Occasional
Recreation and Tourism		
Vehicle Access		
Continue to consult with the City of Mitcham concerning vehicle access and road management.	High	Ongoing
Negotiate an agreed funding arrangement with the City of Mitcham for the reconstruction and ongoing maintenance of Brownhill Creek Road.	High	Moderate
Investigate options and implement measures to reduce speeding and improve safety standards.	High	Short
Investigate an alternate access for visitors that complies with current Australian standards.	High	Short
Assess the suitability of bollards to prevent off road damage and investigate alternative options.	Medium	Short
Provide additional carpark facilities where appropriate to support visitor numbers.	Medium	Moderate

ACTION	PRIORITY	DURATION
Walking Trails and Multi-Use Trails		
Develop and implement a detailed trail plan for the park that complies with all OHSW issues and policies.	Medium	Moderate
Establish a trail maintenance program and provide clearly defined, safe trails for visitors.	Medium	Ongoing
<p>In consultation with Bicycle SA and Office for Recreation Sport & Racing, conduct a risk assessment and if deemed feasible;</p> <ul style="list-style-type: none"> - investigate options for the development of a multi-use trail that uses best practice techniques for visitor safety and environmental protection. - designate the eastern end of the Wirraparinga Trail from the manure pits to the car park as part of the proposed multi-use trail. 	Medium	Moderate
Develop and incorporate interpretive information at places of interest along trails.	Medium	Short
Identify appropriate interpretive themes and arrange for the development of trail-head and trail-side interpretive and directional signs where appropriate.	Medium	Moderate
Facilitate the connection of internal park trails with the regional trail network and liaise with adjoining landowners to investigate the possibility of future linkages.	Medium	Ongoing
Monitor visitor numbers and if necessary provide additional visitor facilities (eg carparks etc) to accommodate demand.	Medium	Ongoing
Horse Riding and Horse Arena		
Develop and implement an agreed horse riding code of conduct between DEH, Office for Recreation Sport & Racing, Horse SA and local riders.	High	Short
Prohibit horse riding off designated tracks to avoid sensitive areas and minimise environmental impact.	High	Short
Monitor the impact of horses on the watercourse and investigate the feasibility of relocating the horse arena to a more suitable location if necessary.	High	Moderate
Encourage and support the continued commitment of the Friends of Brownhill Creek and local riders to minimise the impact of horses and the horse arena.	High	Ongoing

ACTION	PRIORITY	DURATION
Day Visit Areas		
Monitor functions held within and outside the Lions Club picnic ground and if, in the opinion of DEH, behaviour becomes unacceptable (in terms of environmental damage or unacceptable social disturbance), DEH reserves the right to decline future applications.	Medium	Ongoing
Continue the existing arrangement with the Lions Club to maintain the picnic grounds.	High	Ongoing
Investigate options and negotiate partnership arrangements with interested stakeholders in the development and maintenance of visitor facilities and access to toilets for park users.	High	Short
Consider the provision of additional facilities based on visitor demand, and implement subject to available resources and statewide priorities.	Medium	Ongoing
Maintain adequate visitor facilities that comply with Hills Face Zone principles.	Medium	Ongoing
Interpretive Information		
Develop, implement and maintain up to date interpretive information, including brochures, signs and interpretive panels that: <ul style="list-style-type: none"> – convey orientation and basic facility information; – highlight special values and features of the park; – convey information on introduced plants and animals; – include visitor safety information; – indicate acceptable behaviour. 	Medium	Ongoing
Integrate walking trail development with interpretive information.	Medium	Ongoing
Commercial Activities and Other Landuse		
Caravan Park and Campground		
Monitor and regularly review lease conditions as required to ensure their operation is consistent with the natural and historic values of the park.	High	Occasional
Maintain ongoing liaison with the lessee of the Brownhill Creek Caravan Park.	High	Ongoing
Encourage the sensitive upgrade of caravan park facilities to comply with Hills Face Zone principles.	High	Occasional

ACTION	PRIORITY	DURATION
Electricity, Telecommunication and Water		
Maintain accurate records of underground and overhead services to minimise damage through park maintenance and development work.	Medium	Ongoing
Maintain liaison with utility companies and periodically review maintenance programs.	Medium	Ongoing
Ensure that trees adjacent to power lines are pruned regularly to minimise bushfire risk.	High	Ongoing
Investigate the potential for power to be routed exclusively underground, perhaps as part of the road upgrade (see Vehicle Access 4.5.2).	Medium	Short
Management Arrangements		
Partnerships and Cooperative Management		
Continue to consult with the City of Mitcham, the PCWMB, and other relevant bodies to explore the benefits of partnership arrangements that will support future management decisions on issues of common interest.	High	Ongoing
Encourage and contribute to the development of partnership arrangements, to integrate biodiversity and recreation management in the Mount Lofty Ranges, with organisations that have an interest in contributing to the sustainable management of the park.	High	Ongoing
Involve the Kurna Heritage Committee as nominated by the State Aboriginal Heritage Committee, in the cooperative management of the reserve and their Indigenous cultural heritage.	High	Ongoing
Community and Volunteer Involvement		
Support and encourage the Friends of Brownhill Creek Recreation Park and other suitable volunteers to continue their voluntary contribution to park management.	High	Ongoing
In consultation with the Friends of Brownhill Creek Recreation Park and other major volunteer groups, review the direction of work activities based on the initiatives outlined in this plan of management and the <i>Brownhill Creek Recreation Park Vegetation Management Plan</i> (Kinnear <i>et al</i> 2001).	High	Ongoing
In consultation with the Friends of Brownhill Creek, integrate annual work programs of the Friends Group into the proposed DEH management programs for the reserve.	High	Ongoing
Provide additional training opportunities for the Friends Group based upon a mutual recognition of needs.	High	Occasional
Encourage and facilitate the involvement of schools and universities in research and volunteer programs.	Medium	Ongoing
Encourage neighbouring property owners to coordinate revegetation and weed removal efforts with park programs.	High	Ongoing

ACTION	PRIORITY	DURATION
Future Directions		
Additional Land		
Conduct a CARRS assessment and detailed investigation of the suitability of including land in allotment 83 in the hundred of Adelaide, previously included in Brownhill Creek National Pleasure Resort, but omitted from the dedication of Brownhill Creek Recreation Park.	High	Short
Any review for additional land will be based on both strategic and biodiversity perspective's.	High	Short
Any sections added to the park will be managed in accordance with this management plan.	High	Ongoing
Investigate options for appropriate use of Allotment 83 if strategic and biodiversity assessment determines it is not suitable or inclusion in the park.	High	Short

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APPENDIX A : LEGISLATION, CONVENTIONS AND AGREEMENTS

South Australia
<i>Aboriginal Heritage Act 1988</i>
<i>Animal and Plant Control Act (Agricultural Protection and Other Purposes) 1986</i>
<i>Biological Control Act 1986</i>
<i>Catchment Water Management Act 1995</i>
<i>Coast Protection Act 1972</i>
<i>Country Fires Act 1989</i>
<i>Equal Opportunity Act 1984</i>
<i>Environment Protection Act 1993</i>
<i>Development Act 1993</i>
<i>Harbors and Navigation Act 1993</i>
<i>Heritage Act 1993</i>
<i>Historic Shipwrecks Act 1981</i>
<i>Mining Act 1971</i>
<i>National Trust of South Australia Act 1955</i>
<i>Native Title (South Australia) Act 1994</i>
<i>Native Vegetation Act 1991</i>
<i>Occupational Health, Safety and Welfare Act 1986</i>
<i>Petroleum Act 1940</i>
<i>Prevention of Cruelty to Animals Act 1985</i>
<i>Roads (Opening and Closing) Act 1991</i>
<i>Recreational Greenways Act 2000</i>
<i>Soil Conservation and Land Care Act 1989</i>
<i>Water Resources Act 1997</i>
<i>Wilderness Protection Act 1992</i>
Commonwealth
<i>Aboriginal and Torres Strait Islander Heritage Protection Act 1984</i>
<i>Disability Discrimination Act 1992</i>
<i>Environment Protection and Biodiversity Conservation Act 1999</i>
<i>Native Title Act 1993</i>
<i>Natural Heritage Trust Act 1996</i>
International
Japan / China Australia Migratory Bird Agreements (JAMBA, CAMBA)
Ramsar Convention
World Heritage Convention

APPENDIX B : LAND TENURE HISTORY

Brownhill Creek Recreation Park

The recreation area at Brownhill Creek, Mitcham, comprises :-

Section 676, Hundred of Adelaide, described in Crown Record Volume 5758 Folio 609 as "Land declared for Recreation Park purposes pursuant to the *National Parks and Wildlife Act 1972*, known as Brown Hill Creek Recreation Park"; and

Allotment 83 of Filed Plan 150938, the fee simple of which is held under Certificate of Title Volume 5843 Folio 173 in the name of "The Minister of the Crown to whom, for the time, the administration of the *National Pleasure Resorts Act 1914* is committed by the Governor".

Section 676, Hundred of Adelaide

The Hundred of Adelaide was proclaimed on 29th October 1846.

The first survey of the Brown Hill Creek area was made in September 1846 but it was not until the area was resurveyed in 1858 that land was set aside for reserve along the Brown Hill Creek (DBp.45).

The history of the land which is now Section 676, Hundred of Adelaide, is as follows -

21st March 1889

The unnumbered parcel of land set aside as a reserve along the Brown Hill Creek in 1858 was dedicated as a Reserve for Public Recreation purposes and placed under the control of the District Council of Mitcham by proclamation made under the *Crown Lands Act 1888* and the *District Councils Act 1887* (DBp. 45).

11th May 1893

Portion of the Brown Hill Creek Reserve was resumed and dedicated for the purposes of Public Swimming Baths (see Plan A).

Land Grant Volume 579 Folio 200 was issued over the resumed land to The District Council of Mitcham to be used as a site for Public Swimming Baths (cancelled 09/05/1912).

15th March 1894

Blocks B and D were dedicated as additions to the Public Recreation Reserve and placed under the care control and management of the District Council of Mitcham (see Plan A).

14th September 1911

The Brown Hill Creek Recreation Reserve was resumed from the control of the District Council of Mitcham.

9th May 1912

The Land Grant Volume 579 Folio 200 previously issued to the D.C. Mitcham for Public Swimming Baths was cancelled.

15th July 1915

The whole of the land which is now Section 676 was granted to the Attorney-General for the purpose of being used by the public as a Pleasure Resort, Park or Recreation Ground by proclamation under the *National Pleasure Resorts Act 1914*.

1972

The land comprised in the Brown Hill Creek Pleasure Resort was numbered as Section 676, Hundred of Adelaide.

12th December 1974

Section 676, Hundred of Adelaide was constituted as Brownhill Creek Recreation Park under the provisions of Section 33(1) of the *National Parks and Wildlife Act 1972* (Act 56 of 1972).

Allotment 83 of Filed Plan 150938.

The Hundred of Adelaide was proclaimed on 29th October 1846.

The parcel of land which is now Allotment 83 of Filed Plan 150938 is made up of parts of original Sections 890 and 1095 that were granted to private people between 1849 and 1859 (see Certificate of Title Volume 209 Folio 120).

Allotment 83 of Filed Plan 150938 was part of Sections 890 and 1095 as transferred in 1968 to "The Minister of the Crown to whom for the time being the administration of the *National Pleasure Resorts Act 1914 - 1960* is committed by the Governor" (Certificate of Title Volume 3584 Folio 155).

Disposal of portion of the land caused the issue of a new Certificate of Title Volume 3587 Folio 154 which was subsequently cancelled to allow the issue of a computerised certificate of title Volume 5843 Folio 173.

Certificate of Title Volume 5843 Folio 173 has been issued in the name of "The Minister of the Crown to whom, for the time, the administration of the *National Pleasure Resorts Act 1914* is committed by the Governor"

This description requires correction as the *National Pleasure Resorts Act* was repealed by the passing of Act 56 of 1972 (*National Parks and Wildlife Act*).

Allotment 83 of Filed Plan 150938 and Section 676, Hundred of Adelaide are within The Kaurna People Native Title Claim SG 6001/00.

P A Smith

Tenure History Search Unit

30/04/2001

Enclosures

Crown Record Volume 5758 Folio 609

Public Map Hundred of Adelaide 1:005

Survey Diagrams pp. 26, 45 & 63

Certificates of Title Vol.209 Fol.220, Fol. 579 Fol.200, Vol. 3584 Fol.155, Vol. 3587 Fol.154 &

Vol. 5843 Fol. 173

Govt. Gaz. Notices 21/03/1889,11/05/1893,15/03/1894,14/09/1911, 09/05/1912 & 15/07/1915

The National Pleasure Resorts Act (1173 of 1914)

Extract National Parks and Wildlife Act (56 of 1972)

(Report prepared for B Moore Senior Planner Reserve Planning DEH)

APPENDIX C : BROWNHILL CREEK RECREATION PARK – NATIVE PLANTS

Species	Common Name	Conservation Status		
		EPBC Act	NP&W Act	Southern Lofty Region
<i>Acacia acinacea</i>	Wreath Wattle			N
<i>Acacia melanoxylon</i>	Blackwood			
<i>Acacia paradoxa</i>	Kangaroo Thorn			
<i>Acacia pycnantha</i>	Golden Wattle			
<i>Acacia retinodes</i> var. <i>retinodes</i> (swamp form)	Swamp Wattle			
<i>Acaena agnipila</i>	Downy Sheep's Burr		U	U
<i>Acaena echinata</i>	Sheep's Burr			
<i>Acaena novae-zelandiae</i>	Biddy Biddy			
<i>Acrotriche fasciculiflora</i>	Mount Lofty Ground-berry			U
<i>Allocasuarina verticillata</i>	Drooping Sheoak			
<i>Aristida behriana</i>	Brush Wire-grass			U
<i>Arthropodium strictum</i>	Common Vanilla-lily			
<i>Asperula conferta</i>	Common Woodruff			
<i>Astroloma humifusum</i>	Cranberry Heath			
<i>Bothriochloa macra</i>	Red-leg Grass		V	R
<i>Bursaria spinosa</i>	Sweet Bursaria			
<i>Calystegia sepium</i>	Large Bindweed			U
<i>Carex appressa</i>	Tall Sedge			
<i>Carex bichenoviana</i>	Notched Sedge			U
<i>Carex breviculmis</i>	Short-stem Sedge			
<i>Carex fascicularis</i>	Tassel Sedge			U
<i>Cheilanthes austrotenuifolia</i>	Annual Rock-fern			
<i>Convolvulus erubescens</i>	Australian Bindweed			
<i>Cruciferae</i> sp.	Cress Family			
<i>Cyperus gymnocaulos</i>	Spiny Flat-sedge			
<i>Cyperus vaginatus</i>	Stiff Flat-sedge			
<i>Danthonia auriculata</i>	Lobed Wallaby-grass			N
<i>Danthonia caespitosa</i>	Common Wallaby-grass			
<i>Danthonia linkii</i> var. <i>fulva</i>	Leafy Wallaby-grass			U
<i>Danthonia pilosa</i> var. <i>pilosa</i>	Velvet Wallaby-grass			
<i>Danthonia racemosa</i> var. <i>racemosa</i>	Slender Wallaby-grass			
<i>Danthonia setacea</i> var. <i>setacea</i>	Small-flower Wallaby-grass			
<i>Dianella longifolia</i> var. <i>grandis</i>	Pale Flax-lily		R	V
<i>Dianella revoluta</i> var. <i>revoluta</i>	Black-anther Flax-lily			
<i>Dichondra repens</i>	Kidney Weed			
<i>Dodonaea viscosa</i> ssp. <i>spatulata</i>	Sticky Hop-bush			
<i>Drosera peltata</i>	Pale Sundew			
<i>Drosera whittakeri</i> ssp. <i>whittakeri</i>	Sundew			
<i>Elymus scabrus</i> var. <i>scabrus</i>	Native Wheat-grass			

Species	Common Name	Conservation Status		
		EPBC Act	NP&W Act	Southern Lofty Region
<i>Enneapogon nigricans</i>	Black-head Grass			
<i>Eucalyptus camaldulensis</i> var. <i>camaldulensis</i>	River Red Gum			
<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	South Australian Blue Gum			
<i>Eucalyptus microcarpa</i>	Grey Box			U
<i>Eucalyptus viminalis</i> ssp. <i>cygnetensis</i>	Rough-bark Manna Gum			
<i>Geranium potentilloides</i> var. <i>potentilloides</i>	Downy Geranium			K
<i>Geranium retrorsum</i>	Grassland Geranium			
<i>Glycine clandestina</i> var. <i>sericea</i>	Twining Glycine			
<i>Goodenia albiflora</i>	White Goodenia			U
<i>Goodenia ovata</i>	Hop Goodenia			
<i>Goodenia varia</i>	Sticky Goodenia			K
<i>Isolepis cernua</i>	Nodding Club-rush			
<i>Isolepis inundata</i>	Swamp Club-rush			
<i>Juncus bufonius</i>	Toad Rush			
<i>Juncus caespiticius</i>	Grassy Rush			
<i>Juncus pallidus</i>	Pale Rush			
<i>Juncus pauciflorus</i>	Loose-flower Rush			
<i>Juncus subsecundus</i>	Finger Rush			
<i>Labiatae</i> sp.	Mint Family			
<i>Lagenifera huegelii</i>	Coarse Bottle-daisy			
<i>Lepidosperma laterale</i> s.str.	Tall Sword-sedge			U
<i>Lepidosperma viscidum</i>	Sticky Sword-sedge			
<i>Linum marginale</i>	Native Flax			
<i>Lobelia alata</i>	Angled Lobelia			
<i>Lomandra densiflora</i>	Soft Tussock Mat-rush			
<i>Lomandra nana</i>	Small Mat-rush			N
<i>Lomandra sororia</i>	Sword Mat-rush			U
<i>Lycopus australis</i>	Australian Gipsywort			R
<i>Lythrum hyssopifolia</i>	Lesser Loosestrife			
<i>Maireana enchylaenoides</i>	Wingless Fissure-plant			U
<i>Olearia ramulosa</i>	Twiggy Daisy-bush			
<i>Oxalis perennans</i>	Native Sorrel			
<i>Paspalum distichum</i>	Water Couch			
<i>Persicaria decipiens</i>	Slender Knotweed			
<i>Phragmites australis</i>	Common Reed			
<i>Pittosporum phylliraeoides</i> var. <i>microcarpa</i>	Native Apricot			R
<i>Pleurosorus rutifolius</i>	Blanket Fern			U
<i>Poa clelandii</i>	Matted Tussock-grass			
<i>Poa labillardieri</i> var. <i>labillardieri</i>	Common Tussock-grass			

Brownhill Creek Recreation Park Management Plan

Species	Common Name	Conservation Status		
		EPBC Act	NP&W Act	Southern Lofty Region
<i>Prunella vulgaris</i>	Self-heal			
<i>Pteridium esculentum</i>	Bracken Fern			
<i>Pultenaea largiflorens</i>	Twiggy Bush-pea			
<i>Ranunculus lappaceus</i>	Native Buttercup			
<i>Rubus parvifolius</i>	Native Raspberry			U
<i>Rumex sp.</i>	Dock			
<i>Schoenus apogon</i>	Common Bog-rush			
<i>Stackhousia monogyna</i>	Creamy Candles			
<i>Stipa curticoma</i>	Short-crest Spear-grass			U
<i>Stipa flavescens</i>	Coast Spear-grass			
<i>Stipa multispiculis</i>	Small-seed Spear-grass		R	R
<i>Stipa nodosa</i>	Tall Spear-grass			
<i>Stipa puberula</i>	Fine-hairy Spear-grass		R	R
<i>Stipa scabra</i>	Rough Spear-grass			
<i>Stipa scabra ssp. falcata</i>	Slender Spear-grass			
<i>Stipa setacea</i>	Corkscrew Spear-grass			U
<i>Thelymitra nuda</i>	Scented Sun-orchid			
<i>Themeda triandra</i>	Kangaroo Grass			
<i>Typha domingensis</i>	Narrow-leaf Bulrush			
<i>Vittadinia cuneata var. cuneata forma cuneata</i>	Fuzzy New Holland Daisy			
<i>Wahlenbergia stricta ssp. stricta</i>	Tall Bluebell			
99			5	27

APPENDIX D : BROWNHILL CREEK RECREATION PARK – INTRODUCED PLANTS

Species	Common name	Proclaimed
<i>Agrostis capillaris</i> var. <i>capillaris</i>	Brown-top Bent	
<i>Allium triquetrum</i>	Three-cornered Garlic	
<i>Asclepias rotundifolia</i>	Broad-leaf Cotton-bush	
<i>Aster subulatus</i>	Aster-weed	
<i>Avena barbata</i>	Bearded Oat	
<i>Brachypodium distachyon</i>	False Brome	
<i>Briza maxima</i>	Large Quaking-grass	
<i>Briza minor</i>	Lesser Quaking-grass	
<i>Bromus diandrus</i>	Great Brome	
<i>Bromus madritensis</i>	Compact Brome	
<i>Bromus rubens</i>	Red Brome	
<i>Callitriche stagnalis</i>	Common Water Starwort	
<i>Carduus tenuiflorus</i>	Slender Thistle	
<i>Carthamus lanatus</i>	Saffron Thistle	
<i>Centaurium tenuiflorum</i>	Branched Centaury	
<i>Ceratonia siliqua</i>	Carob Tree	
<i>Conyza albida</i>	Tall Fleabane	
<i>Crataegus monogyna</i>	Hawthorn	
<i>Crataegus sinaica</i>	Hawthorn	
<i>Critesion murinum</i> ssp. <i>glaucum</i>	Blue Barley-grass	
<i>Cynara cardunculus</i>	Artichoke Thistle	✓
<i>Cynodon dactylon</i>	Couch	
<i>Cynosurus echinatus</i>	Rough Dog's-tail Grass	
<i>Dactylis glomerata</i>	Cocksfoot	
<i>Echium plantagineum</i>	Salvation Jane	✓
<i>Ehrharta erecta</i>	Panic Veldt Grass	
<i>Ehrharta longiflora</i>	Annual Veldt Grass	
<i>Eucalyptus citriodora</i>	Lemon Scented Gum	
<i>Eucalyptus cladocalyx</i>	Sugar Gum	
<i>Eucalyptus ficifolia</i>	Red Flowered Gum	
<i>Euphorbia peplus</i>	Petty Spurge	
<i>Ficus carica</i>	Edible Fig	
<i>Ficus macrophylla</i>	Moreton Bay Fig	
<i>Foeniculum vulgare</i>	Fennel	
<i>Fraxinus rotundifolia</i> ssp. <i>rotundifolia</i>	Desert Ash	
<i>Fumaria capreolata</i> ssp. <i>capreolata</i>	White-flower Fumitory	
<i>Galium aparine</i>	Cleavers	
<i>Galium divaricatum</i>	Slender Bedstraw	
<i>Gastridium phleoides</i>	Nit-grass	
<i>Genista monspessulana</i>	Montpellier Broom	✓
<i>Geranium molle</i> var. <i>molle</i>	Soft Geranium	

Species	Common name	Proclaimed
<i>Gynandriris setifolia</i>	Thread Iris	
<i>Holcus lanatus</i>	Yorkshire Fog	
<i>Homeria flaccida</i>	One-leaf Cape Tulip	✓
<i>Hypericum perforatum</i>	St John's Wort	
<i>Hypochaeris radicata</i>	Rough Cat's Ear	
<i>Ipomoea indica</i>	Purple Morning-glory	
<i>Juncus articulatus</i>	Jointed Rush	
<i>Kickxia elatine ssp. elatine</i>	Woolly Toadflax	
<i>Lactuca serriola</i>	Prickly Lettuce	
<i>Lathyrus tingitanus</i>	Tangier Pea	
<i>Linum trigynum</i>	French Flax	
<i>Lolium perenne</i>	Perennial Ryegrass	
<i>Medicago arabica</i>	Spotted Medic	
<i>Medicago truncatula</i>	Barrel Medic	
<i>Mentha x piperita var. x citrata</i>	Lemon Mint	
<i>Monadenia bracteata</i>	African Weed Orchid	
<i>Myrsiphyllum asparagoides</i>	Bridal Creeper	✓
<i>Olea europaea ssp. europaea</i>	Olive	✓
<i>Panicum capillare var. brevifolium</i>	Witch-grass	
<i>Paspalum dilatatum</i>	Paspalum	
<i>Pennisetum clandestinum</i>	Kikuyu	
<i>Phalaris aquatica</i>	Phalaris	
<i>Pinus halepensis</i>	Aleppo Pine	✓
<i>Pinus pinea</i>	Stone Pine	
<i>Piptatherum miliaceum</i>	Rice Millet	
<i>Plantago lanceolata var. lanceolata</i>	Ribwort	
<i>Plantago major</i>	Greater Plantain	
<i>Platanus x acerifolia</i>	London Plane	
<i>Polygonum aviculare</i>	Wireweed	
<i>Populus nigra</i>	Lombardy Poplar	
<i>Potamogeton crispus</i>	Curly Pondweed	
<i>Prunus sp.</i>	Plum	
<i>Quercus robur</i>	English Oak	
<i>Ranunculus repens</i>	Creeping Buttercup	
<i>Rhamnus alaternus</i>	Blowfly Bush	
<i>Ricinus communis</i>	Castor Oil Plant	
<i>Robinia pseudoacacia</i>	White Acacia	
<i>Romulea rosea var. australis</i>	Common Onion-grass	
<i>Rorippa nasturtium-aquaticum</i>	Watercress	
<i>Rosa canina</i>	Dog Rose	✓
<i>Rubus spp.</i>	Blackberry	✓
<i>Rumex crispus</i>	Curled Dock	

Species	Common name	Proclaimed
<i>Rumex pulcher ssp. pulcher</i>	Fiddle Dock	
<i>Salix babylonica</i>	Weeping Willow	
<i>Salix discolor</i>	Willow	
<i>Scabiosa atropurpurea</i>	Pincushion	
<i>Senecio mikanioides</i>	Cape Ivy	
<i>Senecio pterophorus var. pterophorus</i>	African Daisy	
<i>Setaria verticillata</i>	Whorled Pigeon-grass	
<i>Solanum nigrum</i>	Black Nightshade	
<i>Sonchus asper ssp. glaucescens</i>	Rough Sow-thistle	
<i>Sonchus oleraceus</i>	Common Sow-thistle	
<i>Sparaxis bulbifera</i>	Sparaxis	
<i>Sporobolus indicus var. capensis</i>	Rat-tail Grass	
<i>Taraxacum officinale</i>	Dandelion	
<i>Trifolium angustifolium</i>	Narrow-leaf Clover	
<i>Trifolium arvense var. arvense</i>	Hare's-foot Clover	
<i>Trifolium campestre</i>	Hop Clover	
<i>Trifolium resupinatum</i>	Shaftal Clover	
<i>Tropaeolum majus</i>	Nasturtium	
<i>Ulmus suber</i>	Cork Elm	
<i>Urospermum picroides</i>	False Hawkbit	
<i>Verbascum virgatum</i>	Twiggy Mullein	
<i>Vicia sativa ssp. sativa</i>	Common Vetch	
<i>Vinca major</i>	Blue Periwinkle	
<i>Vulpia myuros</i>	Fescue	
<i>Watsonia meriana cv. Bulbillifera</i>	Bulbil Watsonia	
<i>Zantedeschia aethiopica</i>	White Arum Lily	
109		9

APPENDIX E : BROWNHILL CREEK RECREATION PARK – NATIVE BIRDS

Species	Common Name	Conservation Status		
		EPBC Act	NP&W Act	Mount Lofty Region
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill			
<i>Acanthiza lineata</i>	Striated Thornbill			
<i>Anas superciliosa</i>	Pacific Black Duck			
<i>Anthochaera carunculata</i>	Red Wattlebird			
<i>Anthochaera chrysoptera</i>	Little Wattlebird			U
<i>Cacatua roseicapilla</i>	Galah			
<i>Cincloramphus cruralis</i>	Brown Songlark			
<i>Climacteris picumnus</i>	Brown Treecreeper			V
<i>Clyptorhynchus funereus</i>	Yellow-tailed Black Cockatoo		V	V
<i>Corvus coronoides</i>	Australian Raven			
<i>Corvus mellori</i>	Little Raven			
<i>Dacelo novaeguineae</i>	Laughing Kookaburra			
<i>Daphoenositta chrysoptera</i>	Varied Sittella			
<i>Egretta novaehollandiae</i>	White-faced Heron			
<i>Falco berigora</i>	Brown Falcon			
<i>Glossopsitta concinna</i>	Musk Lorikeet			
<i>Grallina cyanoleuca</i>	Magpie-lark			
<i>Gymnorhina tibicen</i>	Australian Magpie			
<i>Hirundo neoxena</i>	Welcome Swallow			
<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater			
<i>Malurus cyaneus</i>	Superb Fairy-wren			
<i>Manorina melanocephala</i>	Noisy Miner			
<i>Melithreptus lunatus</i>	White-naped Honeyeater			
<i>Microeca fascinans</i>	Jacky Winter			V
<i>Neochima temporalis</i>	Red-browed Finch			
<i>Ocyphaps lophotes</i>	Crested Pigeon			
<i>Pardalotus punctatus</i>	Spotted Pardalote			U
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater			
<i>Platycercus elegans</i>	Crimson Rosella			
<i>Platycercus eximius</i>	Eastern Rosella			
<i>Psephotus haematonotus</i>	Red-rumped Parrot			
<i>Rhipidura albiscapa</i>	Grey Fantail			
<i>Rhipidura leucophrys</i>	Willie Wagtail			
<i>Sericornis frontalis</i>	White-browed Scrubwren			U
<i>Strepera versicolor</i>	Grey Currawong			U
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet			
<i>Zosterops lateralis</i>	Silvereye			
37			1	7

APPENDIX F : CONSERVATION STATUS CODES

Australian Conservation Status Codes

The following codes are based on the current listing of species under Section 179 of the *Environmental Protection and Biodiversity Conservation Act 1999*.

- EX Extinct:** there is no reasonable doubt that the last member of the species has died.
- EW Extinct in the Wild:** known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CE Critically Endangered:** facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- E Endangered:** facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- V Vulnerable:** facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
- CD Conservation Dependent:** the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

Note: Prescribed criteria as defined under the IUCN Red List of Threatened Species.

South Australian Conservation Status Codes

The following codes are based on the current listing of species under Schedules of the *National Parks and Wildlife Act 1972*, as amended in 2000.

- E Endangered:** (Schedule 7) in danger of becoming extinct in the wild.
- V Vulnerable:** (Schedule 8) at risk from potential or long term threats which could cause the species to become endangered in the future.
- R Rare:** (Schedule 9) 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 threats, but warrants monitoring and protective measures to prevent reduction of population sizes.

Regional Status Codes

The categories below apply to the species distribution at a regional level.

Mammals, Reptiles & Amphibians

There are no regional conservation status categories developed for mammals, reptiles or amphibians to date (2003).

Birds

Regional conservation status for birds follow Carpenter and Reid (1998) *The Status of Native Birds in the Agricultural Areas of South Australia*;

The regions are defined as follows;

ML	Mount Lofty	MN	Mid-North	SE	South-Eastern	KI	Kangaroo Island
MM	Murray Mallee	EP	Eyre Peninsula	YP	Yorke Peninsula		

Plants

Regional conservation ratings for plants follow:

Lang, P.J. & Kraehenbuehl, D.N. (2001). Plants of Particular Conservation Significance in South Australia's Agricultural Regions.

June (2003) update of unpublished database: Florlist. Department for Environment and Heritage.

The regions are as defined by the State Herbarium (Plant Biodiversity Centre), illustrated in the back cover of 'A List of the Vascular Plants of South Australia (Edition IV)' (Ed. Jessop, 1993).

NW North-Western	FR Flinders Ranges	NL Northern Lofty	SL Southern Lofty
LE Lake Eyre	EA Eastern	MU Murray	KI Kangaroo Island
NU Nullarbor	EP Eyre Peninsula	YP Yorke Peninsula	SE South-Eastern
GT Gairdner-Torrens			

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:** (*Plants only*) 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.
- N** **Not of particular significance** (*Plants only*) Also indicated by a blank entry.
- C** **Common** (*Birds only*) Also indicated by a blank entry.
- O** **Occasional Visitor Only** (*Birds only*) Not considered of conservational status.

