Department for Environment and Heritage

Management Plan

Sturt Gorge Recreation Park

2008

Government of South Australia

www.environment.sa.gov.au

This plan of management was adopted on **1 December 2008** and was prepared pursuant to section 38 of the *National Parks and Wildlife Act 1972*.

For further information please contact:
Department for Environment and Heritage
Phone Information Line (08) 8204 1910, or
see SA White Pages for your local
Department for Environment and Heritage office.

This management plan is also available at: http://www.environment.sa.gov.au/parks/management/plans.html

Front Cover: Sturt River (photo by C. Lovering, DEH).

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Government of South Australia
Department for Environment and Heritage

FOREWORD

Sturt Gorge Recreation Park conserves 244 hectares of densely vegetated hill slopes and open space. The park protects the heritage-listed Sturt Gorge Glaciation Geological Site, a site recognised as one of the first in the world to show evidence of glaciation in the southern hemisphere.

Sturt Gorge Recreation Park has long been cherished by South Australians, who frequent the park to enjoy recreation in a natural environment. The land comprising the park is especially significant to Kaurna people.

DEH has negotiated the inclusion of land previously belonging to Minda Inc., along with some tracts of Council reserve to the east of the park to increase the conservation value of the region. When this land is added, the total area of Sturt Gorge Recreation Park will be approximately 444 hectares.

The plan defines a series of objectives and actions for the future management and use of this park and facilitates the development and implementation of high quality conservation programs and visitor facility improvements.

Many people have contributed to the development of this plan of management. Their interest and helpful suggestions are gratefully acknowledged.

I now formally adopt the plan of management for Sturt Gorge Recreation Park under the provisions of section 38 of the *National Parks and Wildlife Act 1972*. I encourage you to read the plan and visit and enjoy this park.

Jay Weatherill

HON JAY WEATHERILL MP

MINISTER FOR ENVIRONMENT AND CONSERVATION

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ACKNOWLEDGEMENTS

DEH acknowledges the advice and valuable input provided for the development of this plan by members of the Sturt Gorge Community Reference Group, the Sturt Gorge Recreation Park Project Team and the Sturt Gorge Recreation Park Management Plan Steering Committee.

1 PARK LOCATION AND FEATURES

Sturt Gorge Recreation Park was proclaimed in 1973 to ensure the significant glacial landforms in the Gorge would be protected in perpetuity. Today, the amenity value of its open space to the people living in surrounding residential areas, plus its remnant biodiversity and recreational values, have assumed similar importance.

The land around and including Sturt Gorge Recreation Park has significant connections to Dreaming for the Kaurna people, the first people of the Adelaide plains. Most Kaurna people regard the Tjilbruke Dreaming, and the sites associated with it, as one of the most important elements of their cultural heritage and identity.

In 1980, Minda Incorporated offered 55 hectares of their Craigburn Farm property to the Government for inclusion in Sturt Gorge Recreation Park. This was part of an agreement by which Minda Incorporated was given planning permission to subdivide land on Black Road, Happy Valley. The remainder of Craigburn (350 hectares) was to be retained as open space. The land added to Sturt Gorge Recreation Park was largely regrowth native vegetation and comprised parts of Sections 21, 22 and 23, now renumbered as Section 1665 (47 hectares). The land was proclaimed as an addition to the park in 1985 and was known as the Craigburn addition. Eight hectares of the gifted land were excluded for addition to Flagstaff Hill Primary School.

The park covers 244 hectares and is situated in the foothills of the southern Mount Lofty Ranges, about 13 kilometres south of the Adelaide CBD (Figure 1). More land additions are proposed for the park, which would contribute approximately 200 hectares to the north and east of the present park area. These proposed additions are currently under the ownership of the Minister for Urban Development and Planning and are known as the Craigburn Farm additions (Figure 2). For the sake of distinction this is what the land will be referred to throughout this document.

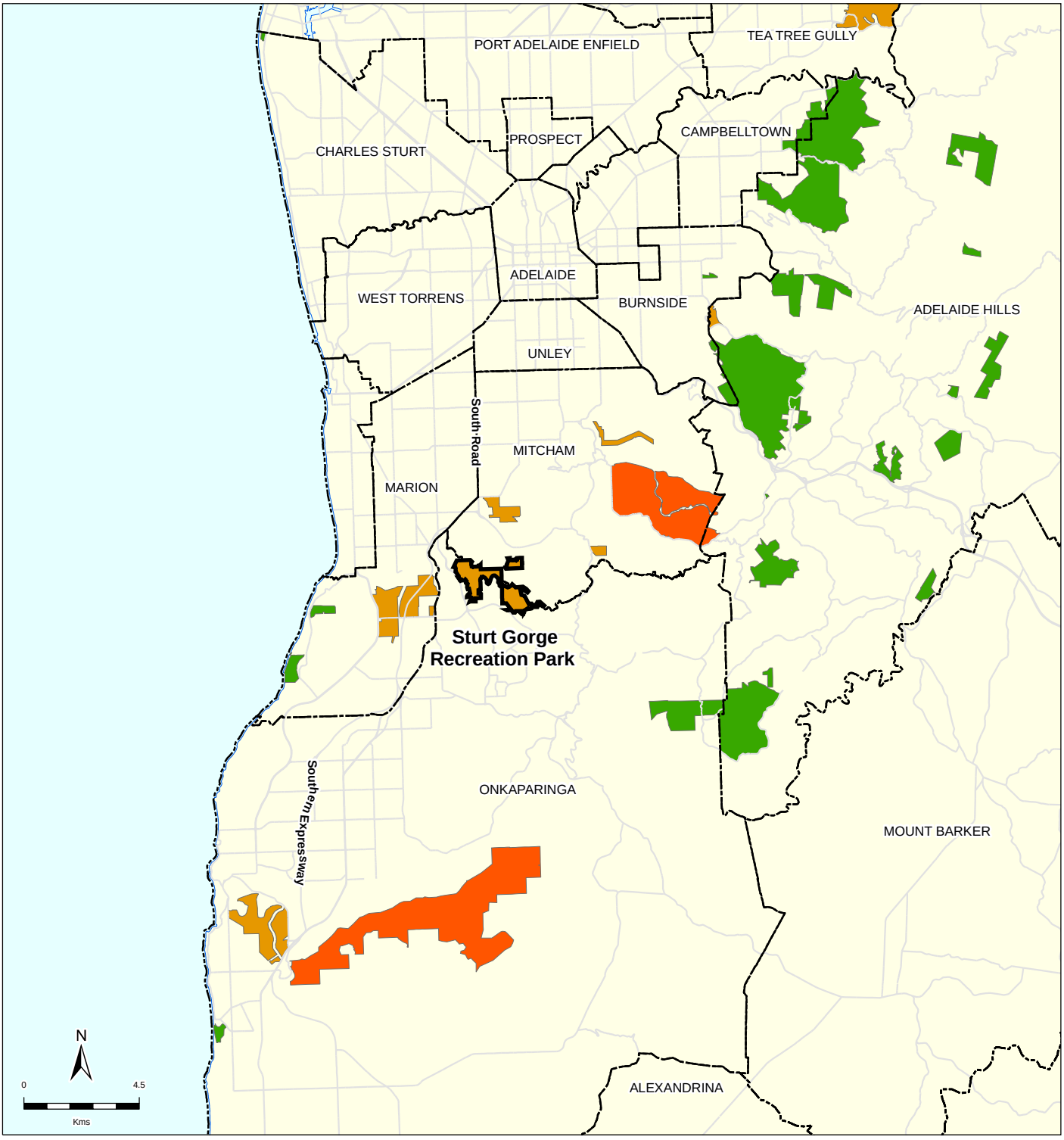
Sturt Gorge Recreation Park includes sites of great geological significance. Sections of the existing park were cleared and grazed, the remaining native vegetation includes Grey Box Woodland, which is poorly conserved in South Australia. This remnant native vegetation and the more recently revegetated areas provide wildlife habitat, particularly for bird species, and improve the amenity of the surrounding suburbs. The Craigburn Farm land comprises largely cleared, grazing land, with remnants of the original native vegetation.

The Sturt Gorge area experiences a typical Mediterranean climate with cool, wet winters and warm, dry summers. The average annual rainfall is around 610 mm. Rain falls mainly during the five coldest months of the year, from May through to September.

The park makes a valuable contribution to regional hydrology. It forms part of the catchment of the Sturt River system that flows on down through the Sturt Gorge itself. The Adelaide and Mount Lofty Ranges Natural Resource Management (AMLRNRM) Board is responsible for the natural resource management of this catchment area and is responsible for assessing and managing environmental water requirements for the Sturt River.

There is an area of land entirely encompassed by the Recreation Park which remains under the ownership of SA Water and co-management of SA Water and the AMLRNRM Board. It is proposed that the dam immediately upstream of the dam wall, as well as the dam wall and its associated infrastructure remain under the ownership of SA Water and that the remainder become part of the Recreation Park (Figure 2). SA Water will retain responsibility for the maintenance of the dam structures, and the AMLRNRM Board will continue with responsibility for the maintenance of the outlet works and detention basin, and through its contractors, inspect and clean the trash screens. The Board is also responsible for assessing and managing environmental water requirements for the Sturt River.

This management plan replaces the 1990 *Sturt Gorge Recreation Park Management Plan*.



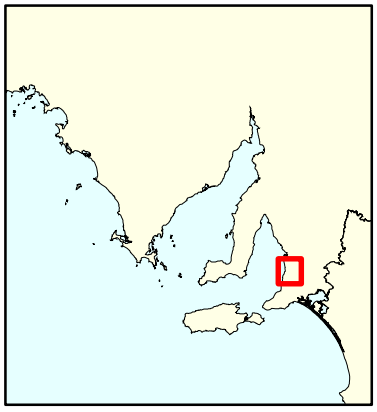


Figure 1

Sturt Gorge Recreation Park

Location

LEGEND

- Local Government Area
- Sturt Gorge Recreation Park
- Recreation Park
- National Park
- Conservation Park

Produced by	Land Management Branch Department for Environment and Heritage PO Box 1047 Adelaide SA 5000 www.parks.sa.gov.au
Data Source	DEH Spatial Database
Compiled	25 August 2008
Projection	Lambert Conformal Conic
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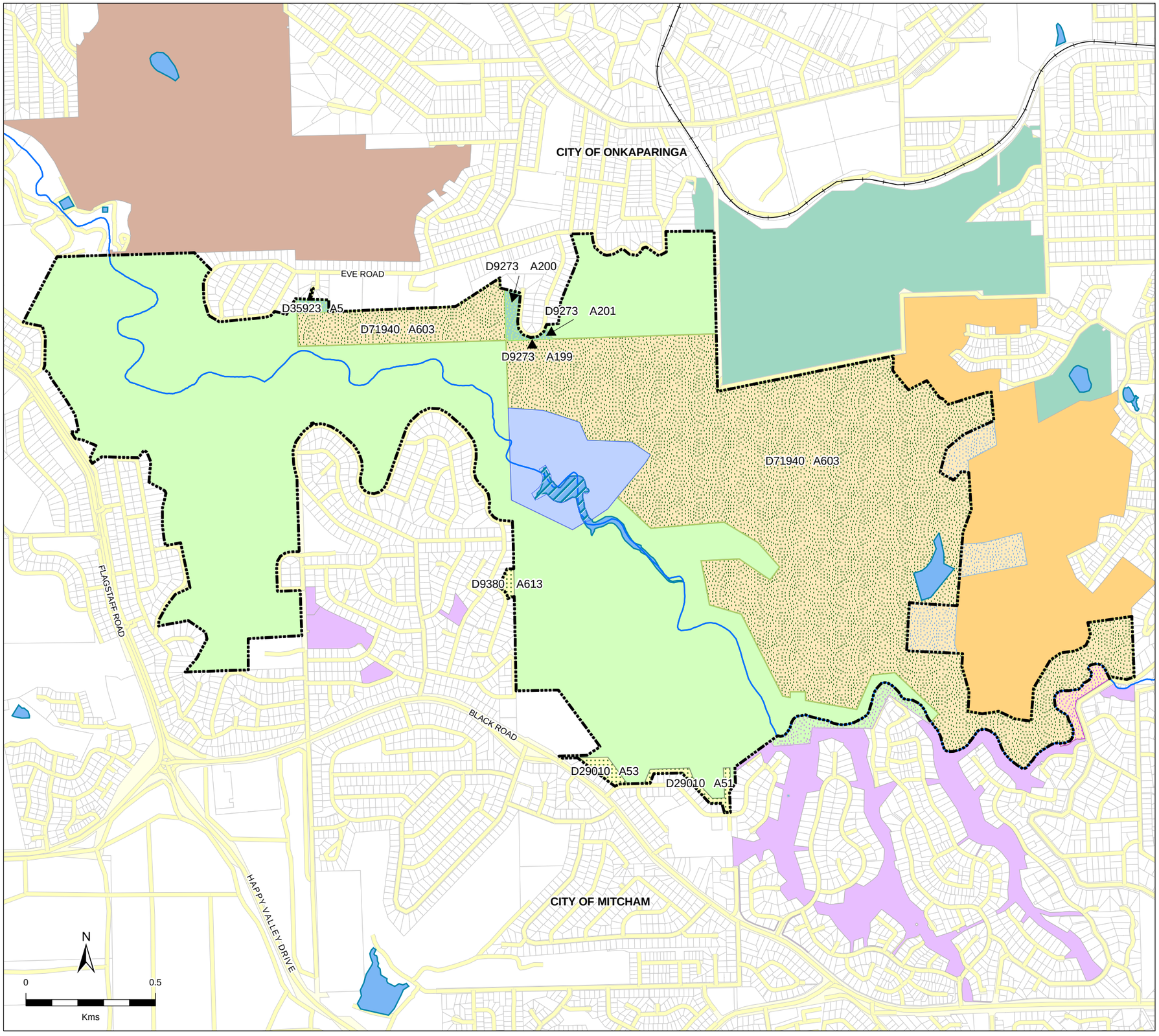

Figure 2

Sturt Gorge Recreation Park

Current Land Tenure and Proposed Park Boundary

LEGEND

- Roads
- Railway
- Proposed Sturt Gorge Recreation Park boundary
- Local Government Boundary (coincides with Sturt River)
- Dams
- Cadastre

Current Land Tenure

- City of Mitcham
- City of Onkaparinga
- Flinders University
- Minda Incorporated
- Minister for Environment and Conservation (MEC)
- Minister for Urban Developement and Planning (MUDP)
- SA Water

Proposed Land Exchanges

- SA Water to MEC
- City of Mitcham to MEC
- City of Onkaparinga to MEC
- MUDP to MEC
- MUDP to City of Mitcham
- MUDP to City of Onkaparinga
- MEC to City of Onkaparinga
- Remains SA Water
- Remains SA Water

Produced by	Land Management Branch Department for Environment and Heritage 1 Richmond Road, Keswick, SA 5035 http://www.environment.sa.gov.au/
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Note: this map displays proposed tenure arrangements that have been agreed to in principle but not yet finalised. See Section 10 of this management plan for further details.

DEH MapID: 2008-424

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2 LEGISLATIVE FRAMEWORK

2.1 National Parks and Wildlife Act 1972

Reserves are managed by the Director of National Parks and Wildlife subject to any direction by the Minister for Environment and Conservation or the Chief Executive of the Department for Environment and Heritage (DEH). When managing reserves, the Director is required under section 37 of the *National Parks and Wildlife Act 1972* to have regard to, and provide actions that are consistent with the following objectives of management 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 geographical, 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;
- generally, the promotion of the public interest; and
- preservation and protection of Aboriginal sites, features, objects and structures of spiritual or cultural significance within reserves.

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.

DEH is responsible for preparing management plans and undertaking the prescribed community consultation process for the park. A standard management planning process is mandated to ensure that all statutory obligations are met. Help and guidance with plan preparation is sought and obtained from individuals, community groups or relevant advisory committees, although the Minister ultimately decides whether to adopt a management plan.

The draft plan for Sturt Gorge Recreation Park was released for public exhibition in November 2006. At the close of the comment period, 42 submissions were received, raising issues including recreational access and zoning prescriptions. All comments and concerns were considered by the South Australian National Parks and Wildlife Council for advice before the plan was presented to the Minister for adoption.

In accordance with the Act, the provisions of this management plan must be carried out and no actions undertaken unless they are in accordance with this plan. In order to achieve this, each year park managers, taking regional and district priorities into account, draw up work programs to implement strategies proposed in management plans. Implementation of these projects is determined by, and subject to, the availability of resources (eg staffing and funding).

2.2 Native Title Act 1993

Native Title describes the rights and interests Aboriginal and Torres Strait Islander People have in land and waters according to their traditional laws and customs. Commonwealth legislation, in the form of 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.

This management plan is adopted and released subject to any native title rights and interests that may continue to exist in relation to the land and/or waters. Before undertaking any acts that might affect native title, DEH will follow the relevant provisions of the *Native Title Act 1993*.

3 VISION

Sturt Gorge Recreation Park is a key tract of public open space in the southern metropolitan area, highly valued by the community for its visual amenity, biodiversity, cultural and recreational values. The park is a vital link in the Adelaide Hills chain of reserves.

The over-arching vision for Sturt Gorge Recreation Park is to have a reserve that provides for recreation opportunities in a natural environment and contributes to the conservation of biological diversity.

DEH will collaborate with a number of groups and agencies in managing the park. It is envisaged that the local community, in particular, will be encouraged to continue to play a significant role in its ongoing care and management.

4 ZONING

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

The *Sturt Gorge Recreation Park Vegetation Management Plan 2003-2008* (Quarmby 2003; hereafter cited as Vegetation Management Plan) has been used to provide a scientific foundation for zoning the park that can guide and accommodate uses and activities by providing an underlying, ecological basis for decision making.

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

Conservation Zone

The Conservation Zone incorporates a central core area within the existing park, comprising those vegetation management units identified in the Vegetation Management Plan as being of highest conservation significance. This zone is a priority area for conservation management and complements the high biodiversity of the adjoining Blackwood Hill Reserve. Public use of this zone will be restricted to activities that do not impact detrimentally on natural and cultural values.

Some recreation activities will be allowed in this zone however the important natural and cultural values warrant a planned and cautious approach to ensure that all activities are sustainable. Wherever possible the Recreation Zone will be the focus for the majority of recreation activity. Visitors will be allowed to walk dogs on a lead.

Works undertaken to achieve conservation goals will be allowed and fire management works including prescribed burning, fire track and trail maintenance will be permitted. However, activities should not be allowed which may result in environmental degradation or where insufficient knowledge exists as to their potential environmental impact.

The Trails Master Plan (see Section 8.1 Visitor Access) will identify a route for the Sturt River Linear trail network in relation to Sturt Gorge Recreation Park. The route may pass through the Conservation Zone, in which case it will be the only multi-use trail within the zone. The trail would meet sustainable trail guidelines and environmental impacts would be managed.

Given that the Conservation Zone completely surrounds the SA Water land, SA Water may require use of a small section of this land for dam maintenance and construction. Any such activities that fall in the Conservation Zone must include close liaison between DEH staff and SA Water staff or contractors, to manage and minimise impacts on natural values.

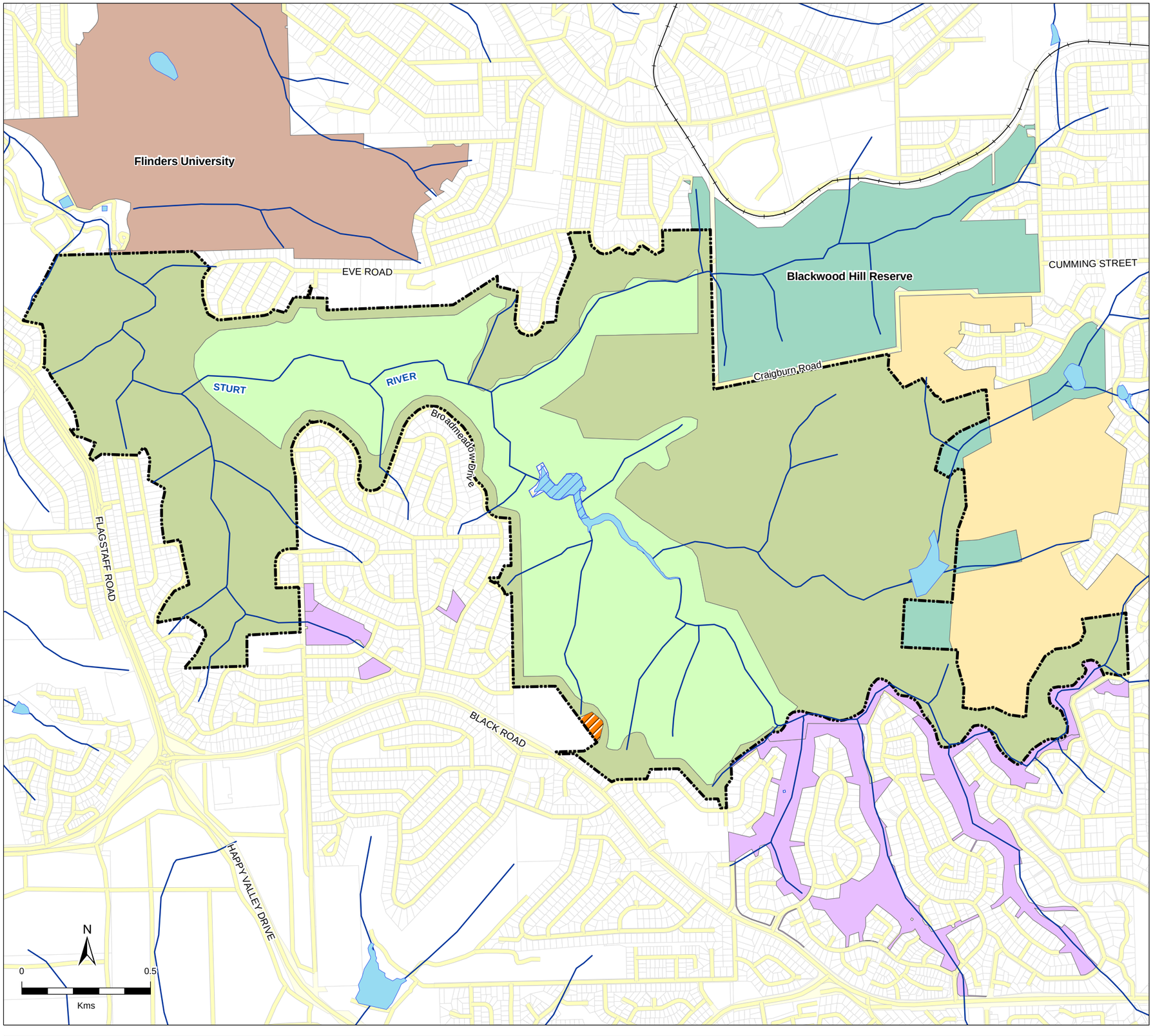

Figure 3

Sturt Gorge Recreation Park

Zoning and Features (for proposed park area)

LEGEND

- Watercourses
- Railways
- Roads
- Proposed Sturt Gorge RP boundary
- Water Bodies
- Cadastre
- Flinders University
- Minda Incorporated
- State Heritage Places

Sturt Gorge Zoning

- Conservation Zone
- Recreation Zone
- Leased Zone

Proposed Land Tenure

- City of Mitcham Reserves
- City of Onkaparinga Reserves
- SA Water

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Note: this map displays proposed tenure arrangements that have been agreed to in principle but not yet finalised. See Section 10 of this management plan for further details.

DEH MapID: 2008-431

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Prescription

- Give priority within this zone to the protection and enhancement (including revegetation) of native vegetation communities and fauna habitats. Focus available resources through the effective coordination and involvement of volunteer conservation groups.
- Raise the community's awareness of the environmental significance of this zone through the use of promotional material and installation of signs. Ensure all visitors to the park, including cyclists, horse riders and bush walkers, are aware of the zone's boundaries and management restrictions.
- Ensure that existing walking trails within the zone do not bisect communities of significant vegetation. Where this has occurred, the trail should be realigned or special techniques used to avoid impacting vegetation.
- Any new trails in the area should be designed responsibly and sustainably, such that they have minimal affect on the native vegetation and fauna, while providing maximum benefit to the community.
- Protect the environmental values of the zone through the exclusion of the following activities:
  - horse riding;
  - cycling (except on the multi-use trail that forms part of the Sturt River Linear trail network);
  - orienteering (unless events have written approval and take place during the appropriate season);
  - unrestrained dog exercising;
  - motor vehicular (including motor cycle) traffic except for management or emergency purposes; and
  - built structures (except for signs, fences and seating).

<u>Recreation Zone</u>

The Recreation Zone comprises most of the remainder of the park. The majority of the Craigburn Farm land added to the park will fall within the Recreation Zone. Although degraded, this area still supports natural values and recreational activities should be compatible with the environmental values of the area. The Recreation Zone entirely encompasses the Conservation Zone, creating a buffer from the edge of the park and recognising existing recreational use of the edges of the park.

The Recreation Zone has important natural and cultural values but will be the focus for sustainable recreation activity. This enables visitors to enjoy the park whilst ensuring that risks to the conservation zone are avoided. The construction and use of trails for a range of activities including walking, cycling and horse riding will be focused in the Recreation Zone. Detailed trails planning will be undertaken in conjunction with the community to ensure that these activities are sustainable.

Dogs are permitted in the zone, provided they are leashed and under control of a responsible person. Tracking dogs may be permitted off lead for special events by prior arrangement with the park manager. Motor vehicle use will be restricted to emergency and management activities, access by lessees or by special arrangement.

Some low key visitor facilities development may occur in the longer term. Any such development would occur only after extensive consultation with Councils and other stakeholders through the development of a Visitor Facilities and Services Plan.

Prescription

- Ensure that native vegetation communities and fauna habitats within the Recreation Zone are protected and enhanced and habitat restoration projects undertaken.
- Develop management strategies using the Recreation Zone as a buffer zone to minimise the impact of human activity and the spread of threatening processes on the borders of the Conservation Zone.
- Permit a range of recreation activities within the Recreation Zone, subject to DEH approval.

- Allow cycling and horse riding on designated trails.
- Permit orienteering with prior written approval.
- Dogs may be taken into the Recreation Zone provided they are restrained on leads. Tracking dogs may be allowed off lead for special events, subject to the prior approval of the park manager.
- Develop facilities only after extensive planning and consultation.

Leased Zone

Currently the only area leased to a third party is the Scout facility off Black Road. Depending on the terms and conditions of the leases negotiated, lessees are normally given virtually exclusive use and sole responsibility for the management of those areas (and responsibility for the provision of any utility services). Development and building works are permitted within a leased zone, subject to conditions in the lease agreement.

Prescription

- Allow for the continued operation of the Scout facility within its existing leased area during the term of this management plan.
- Permit bonfires on the Scout lease area outside of the fire danger season, subject to approval of the park manager.
- Ensure that any new leases elsewhere on the subject land and associated buildings or permanent structures are consistent with the intent of this management plan.
- Other than for groups with statutory rights, it is not envisaged for any new leases to be approved for the life of this plan.

State Heritage Place

The Sturt Gorge Glaciation Geological Site, Sturt Gorge Recreation Park is entered in the South Australian Heritage Register as a State Heritage Place, in accordance with the criteria in the *Heritage Places Act 1993*. The provisions of the *Development Act 1993* ensure heritage values of state heritage places are maintained. The border of the area follows the original boundaries of the Sturt Gorge Recreation Park, with smaller sites within this area identified as being of particular significance (Figure 3).

This geological site is a Sturt Tillite Precambrian glacial deposit. The glaciation represented at this site is now recognised as having been of worldwide extent. It is highly significant for understanding the worldwide Precambrian glacial period through the correlation of contemporary rocks elsewhere. In 1900 the pioneering South Australian geologist Walter Howchin first obtained evidence for the glacial origin of these rocks which was acclaimed as the first evidence of such an ancient glaciation in the southern hemisphere and one of the few then known anywhere in the world. The place is of very high significance for geological education and research and has been designated a Geological Monument by the Geological Society of Australia (South Australian Division).

Although the State Heritage Place is not a zone under the *National Parks and Wildlife Act 1972*, management directions should be aligned with maintaining the heritage values of this area, through the provisions of the *Development Act 1993*. Any on-ground works (including activities that materially affect the heritage values) will be subject to development approval.

Objective

Use zoning to maintain the natural and recreational values of Sturt Gorge Recreation Park.

Strategies

- Zone the park according to the above prescriptions.
- Maintain heritage values within the State Heritage Place.

5 MANAGING NATURAL HERITAGE

5.1 Geology, Soils and Landform

Most of the sedimentary rocks of the Adelaide Hills belong to the Burra Group, deposited in shallow Precambrian seas between 800 and 750 million years ago. Towards the end of this period, dramatic changes in climatic conditions occurred, with the onset of a great ice age that affected a large part of Australia. Sturt Gorge is an area of considerable geological significance that first came to prominence in 1900 when Professor Walter Howchin was able to demonstrate the glacial origin of some of the rock strata exposed there.

This Precambrian material, at least 750 million years old, is known as the Sturt Tillite. It holds the distinction of being the first evidence of glaciation at such an early stage in the geological history of the world. The occurrence of this formation in its type locality and exposed so close to Adelaide heightens the significance of the Gorge, particularly for educational purposes. Given their scientific significance, Sturt Tillite exposures should be protected from adverse impacts and information on their significance should be promoted to visitors. At some locations there appears to be damage, probably caused through use of geological hammers. As the site is a geological monument and State Heritage Place, samples must not be collected from the area.

Generally, the steep slopes of the existing park area have limited soil development and exhibit skeletal soils, largely without profile, developed from the local parent material. However, in areas associated with calcareous slates and dolomitic parent materials, there is a tendency towards the development of shallow, stony rendzina soils. Carbonate removed from the surface of these soils is concentrated to some extent as a layer of calcrete or calcareous silt overlying weathered parent material. Talus has developed below steep slopes where there has been an accumulation of soil and rock debris eroded from the slope above. These areas and the alluvial soils associated with the river flats along Sturt River and tributaries, provide the only exceptions to the skeletal soils prevailing in the existing park area.

On the Craigburn Farm land additions, an area of generally lower relief and gentler slopes, soil development is more advanced. Much of this land has a surface of sandy sediments deposited in Quaternary and Tertiary times. In this area, soils tend to comprise grey to brown-grey sands over bright yellow to reddish brown sandy clays, which in turn rest on weathered slate or sands and soft clayey sandstone. It is through soils of this type that some major erosion has occurred in the past and it would appear that this particular soil type is very susceptible to soil erosion once the vegetation cover has been disturbed.

The 1990 management plan noted that erosion on a scale that required active control measures was occurring at several locations within the park. In most cases, the problem had developed following the increase in water runoff associated with residential housing development. While some efforts were made to deal with this problem during the term of the first plan, they have only been partially successful. Remedial works should be undertaken and storm waters re-directed, with appropriate barriers installed to reduce erosion in sensitive and high impact areas.

Any on-park earth-works should be localised and carried out in a manner that does not increase the risk of erosion or silt run off into the creeks. This risk needs to be borne in mind particularly when undertaking weed control activities that involve the removal of substantial areas of non-indigenous vegetation. Recreational activities can also cause localised but potentially severe soil erosion and soil compaction if not managed effectively.

Visitors, particularly those people using the park for active recreation, should be informed of any existing or erosion-prone areas and requested to avoid unnecessary intrusion by using the designated trails. Construction of any new access routes requires care and the siting of trails should be done in such a way that the potential for soil erosion is minimised.

Objectives

Protect the internationally important geological assets of the park.

Protect the soils on the park from adverse impacts.

Strategies

- Educate visitors of the importance of the Sturt Tillite, and protect from damage. Allow no samples to be taken from the site.
- Assess soil type and properties, including soil erosion potential, when planning for future management activities (eg vegetation removal), visitor access or when undertaking management and development works (including trail construction).
- Maintain, improve, repair (or close temporarily, permanently or relocate) management access tracks and walking trails to stabilise soil as required.
- Identify existing areas of erosion and undertake remedial works that may include storm water re-direction, public exclusion, and pest plant removal combined with natural regeneration or revegetation.

5.2 Hydrology

The Sturt River is the main watercourse in the park and the largest stream in the Patawalonga Basin, which is one of the major catchments of the western Mount Lofty Ranges.

The AMLRNRM Board currently monitors water quantity, quality and river health for a variety of parameters: microbiological bacteria, nutrients, heavy metals, salinity, dissolved oxygen, pesticides and macro-invertebrates. The only monitoring site on-park is near the flood control dam. Records indicate that water quality in the Sturt River is generally poor though variable, depending on seasonal water flow factors. The level of *Escherichia coli* and faecal *Streptococci* recorded are extremely variable and are periodically quite high but not likely to endanger human health. Banning visitors from all water contact is not justified, but prudent risk management requires swimming should be prohibited. DEH should liaise closely with the AMLRNRM Board and be kept aware of the results of further water quality monitoring and continually reassess the risk situation. The flood control dam structure and the associated wet detention basin have significant implications in terms of public risk.

Several minor tributaries of the Sturt River drain areas of the park. The largest of these is known locally as Spring Creek and drains a valley known as Spring Gully, in the western section of the existing park. Magpie Creek drains into the park from the Blackwood Hill Reserve to the north (Figure 3). There is also a large dam located within the Craigburn Farm additions, which is proposed to become part of Sturt Gorge Recreation Park (Figure 3).

The potential for erosion and the resultant siltation/contamination of the Sturt River is seen as a park management issue. It would be a desirable long-term goal to restore the riverine environment in the park to a condition that approaches 'natural' and thereby ameliorate some of the impacts arising from elsewhere in the catchment. Riverbank stabilisation/restoration has been and should remain a priority for the term of this management plan.

The AMLRNRM Board is responsible for improving water quality through improved catchment management practices and can assist park managers by ensuring that all activities along the creeks of the catchment are compatible with the preservation of natural flows and the conservation of biodiversity. The AMLRNRM Board has been active in exotic tree and weed removal and stream rehabilitation along the Sturt River. The Board is also responsible for assessing and managing environmental water requirements generally. Strategies by DEH to address riparian management issues undertaken in the park need to continue in collaboration with the AMLRNRM Board and subject to the *Patawalonga Catchment Water Management Plan 2002-2007* (or its successor).

The AMLRNRM Board encouraged the development of the *Sturt River Linear Park Master Plan* from Belair National Park/Coromandel Valley (Frank Smith Dam/Wetland) downstream to the Patawalonga Lake. Recent work with the City of Marion has been productive and efforts now need to be concentrated on the upper reaches from South Road, Darlington, up to the Sturt Gorge Recreation Park and beyond in the jurisdiction of the Cities of Onkaparinga and Mitcham. It is understood that the Cities of Mitcham and Onkaparinga desire to negotiate better tenure to ensure proper watercourse management and establish the Sturt River Linear Park.

The portion of this proposal located on the subject land should enhance this concept and provide appropriate walking access. DEH should liaise with the AMLRNRM Board to further the concept of developing a series of linked wetlands on the proposed Craigburn Farm additions in the vicinity of the existing dam.

Adelaide's Mediterranean climate and topography of slopes and plains, plus human-induced changes to ground cover and drainage, can lead to rapid run-off when it rains. Flooding is most likely to occur after a long period of heavy rainfall, due to the combined effects of run off from the surrounding urban areas and a substantial contribution from the up-stream catchment, which becomes saturated in these long duration storms. The flood control dam on the Sturt River is an engineering response to such infrequent, but potentially devastating flood events. This structure was built in conjunction with the Sturt River Drain from Darlington to Glenelg.

In 1997 the then Patawalonga Catchment Water Management Board established the wet detention basin in the lower portion of the flood control dam to improve water quality downstream. This facility achieves that by settling sediments and other contaminants without impacting on the primary performance of the flood control function. The AMLRNRM Board now has responsibility for the maintenance of the outlet works and basin and inspects and cleans the trash screens periodically. From time to time, the basin will need to be desilted. Consequently both short term and ongoing debris maintenance should be allowed for. There is a requirement to secure a small area where debris material that is collected can be stockpiled over short periods to make the clearing operation viable. The small area needed could be located at the top of the management access track just inside or adjacent the previous SA Water/Craigburn Farm boundary (ie near the last gate on the way in). Contractors would be directed to remove this material (mainly logs, timber and reeds) on a regular basis.

Sediment management needs are likely to be longer term. From time to time it is anticipated that the Wet Detention Basin will trap significant volumes of silt and sediment washed down from upstream during high flow events. It is possible that the sediments will periodically need to be collected and removed from behind the dam. This spoil material can be used, subject to environmental checks. These sediments could be mounded and topped with soil in the existing grazed sections of the proposed Craigburn Farm additions near the SA Water entrance to the Flood Control Dam. This operation could fit with an AMLRNRM Board supported longer-term revegetation plan in a suitable designated area.

SA Water may need to access an area of land around the flood control dam to carry out upgrade works. If the proposed 10 metre boundary is insufficient, SA Water will liaise with DEH staff to ensure any infrastructure development impacts are minimised in the Conservation Zone.

DEH should continue to cooperate with SA Water, the AMLRNRM Board and the Cities of Mitcham and Onkaparinga to implement/maintain flood mitigation measures, stream restoration, debris management and desilting operations.

Objective

Manage catchment water to improve water quality and the ecosystems and hydrology of riverine environments of the Sturt River and other watercourses, restoring to as near 'natural' condition as possible and maintaining the highest water quality standards.

Strategies

- Manage on-park (and engage with other authorities and neighbours regarding off-park) activities to minimise adverse impacts on the Sturt River hydrology and creek systems. In particular, ensure that existing park management and recreation activities are compatible with maintaining environmental and hydrological values.
- Participate in regional catchment management programs, in partnership with the AMLRNRM Board and the Cities of Mitcham and Onkaparinga, in support of flood mitigation schemes, stormwater quality improvement and minimise any negative impacts to the park catchment.
- In collaboration with the AMLRNRM Board continue the environmental restoration of the Sturt River. Collaborate with the AMLRNRM Board and other authorities to identify and repair existing areas of erosion through coordinated revegetation and pest plant eradication programs.
- Incorporate a section of the Sturt River Linear Park though the park by making suitable provision, where appropriate, for walking and other types of public access for recreation, maintaining conservation values at all times.
- Continue to encourage and support the involvement of volunteers in revegetation programs in riverine areas and (potentially) the monitoring of water quality.
- Manage public risk associated with water quality and water management facilities and the nearby high-risk structure of the flood control dam and wet detention basin.

5.3 Native Vegetation

Prior to settlement it is thought that much of the subject land would have supported Sheoak (*Allocasuarina verticillata*) and Grey Box (*Eucalyptus microcarpa*) Woodland. Grassy Woodlands are recognised as amongst the most threatened habitats in Australia. It is now believed that much of the Grey Box Woodland that once extended across the Southern Mount Lofty Ranges was naturally sparse and open in nature, with a grassy understorey, and that the western portion of the Sturt Gorge Recreation Park was probably naturally open. River Red Gum (*E. camaldulensis*) Woodland occurred along the watercourses and while some large trees still survive in these locations, the riverine understorey is largely dominated by non-indigenous species. On the Craigburn Farm area, the only significant areas of native vegetation occur along the creek lines.

The Vegetation Management Plan has set out an ecologically based system that enables DEH (when undertaking conservation management) to direct resources to the highest priority vegetation areas. The park and key adjoining parcels of land have been divided into 32 vegetation management units, ranked according to rated species value, vegetation association integrity and environmental weed threat. Based on this analysis it has been possible to prescribe achievable management objectives for each vegetation management unit, aimed at maximising biodiversity conservation outcomes.

The Vegetation Management Plan was preceded by a comprehensive vegetation survey of both the current and pre-European vegetation communities. Craigburn Farm comprises mostly cleared grazing land with introduced pasture grasses, but there are a number of large South Australian Blue Gums (*Eucalyptus leucoxylon*) and Grey Box trees remaining. Further investigation may reveal other remnants of botanical interest along the creek lines on this land, in addition to the dominant River Red Gums.

The Sturt River and the creeks on the subject land that feed into it are important components of the Patawalonga Catchment area. During the term of the first management plan, substantial effort has been directed towards restoring this riverine environment to support its hydrological and biodiversity conservation functions.

It is evident from the vegetation surveys that the park still supports a wide variety of indigenous plant species, but grazing, timber cutting and cropping has severely modified the native vegetation associations. Since the cessation of grazing in 1966 regeneration of *Eucalyptus* and *Allocasuarina* species has occurred and extensive tree planting and revegetation projects have taken place.

There are nine native plant species considered to be of State conservation significance found on the park, including *Glycine tabacina*, *Bothriochloa macra*, *Dianella longifolia* var *grandis*, *Logania saxatilis*, *Austrostipa gibbosa*, and *Austrostipa multispiculis.* There are also 58 species of regional conservation significance found on the park. A complete list of species of conservation significance is included in the Vegetation Management Plan.

Because of the open and degraded nature of the western part of Sturt Gorge Recreation Park, plus its high visibility and proximity to residential areas, concerted efforts have been made since the 1970s to re-establish native vegetation. As a result, in some areas of the park there is now a dense cover of both indigenous and non-indigenous native shrubs and trees. Details of these revegetation efforts are included in the Vegetation Management Plan. In more recent years, the Cities of Mitcham and Onkaparinga and groups associated with the AMLRNRM Board have been active in restoring riparian habitats along the Sturt River corridor by removing woody weeds and replacing them with more appropriate native species.

The Vegetation Management Plan suggests that the type of revegetation undertaken in the past may have been misguided and could in fact be detrimental. Inappropriate revegetation efforts have come to be seen as a threat to the survival and regeneration of grassland communities. Many of the earlier projects, especially the larger scale projects, focussed on planting trees and shrubs along easily accessible trails, with the aim of establishing a dense cover of native vegetation.

Dense revegetation areas have come to constitute a considerable fire management risk, as they increase fuel loads and can compromise fire fighting capabilities due to their close proximity to fire access tracks. It is critical that any future revegetation strategies are planned with consideration to fire prevention and suppression, and to ensure fuel loads are not increased in high risk areas, near fire access tracks or park boundaries. Current recommended practice is to attempt

replicating the natural diversity and structure of pre-colonisation vegetation communities, paying particular attention to local variations in species diversity and habitat structure.

The Vegetation Management Plan provides a guide for species suitable for future revegetation that will ensure appropriate biodiversity conservation outcomes. DEH remains committed to supporting community groups and adjoining landowners in managing and regenerating native vegetation in a manner that protects and improves natural biodiversity and contributes to the creation of biological corridors and improved catchment water quality. The Blackwood Hill Reserve, managed by the City of Mitcham, is of high biodiversity value and a prime example of an area where collaborative management is desirable.

Large remnant native trees may be protected as 'significant trees' if they meet the criteria of the *Development Act 1993* (trunk circumference of two metres or greater). Although 'tree-damage' (see definition in section 5.5 Introduced Plants) is controlled, pruning and lopping of significant natives will be allowed only when deemed necessary for biodiversity management or when there is significant risk to life or property.

The Vegetation Management Plan identifies the control of environmental weeds as the highest priority for native vegetation management. Moreover, in some areas there are insufficient native seed reserves to enable successful natural regeneration and re-vegetation will still be required. As a general principle, it is recommended that where regeneration is unlikely to succeed, revegetation be used as a means of replenishing native seed reserves, reinstating natural regeneration and restoring native vegetation associations.

Phytophthora

Cinnamon Fungus (*Phytophthora cinnamomi*) and other species of *Phytophthora* are introduced plant pathogens that cause disease and death in a range of native plant species. *Phytophthora* is recognised by the Australian Government as a key threat to the survival of our native plants and animals and has developed a National Threat Abatement Plan (Environment Australia, 2001).

Symptoms of *Phytophthora* dieback have not been observed in Sturt Gorge Recreation Park, but are present elsewhere in the region. Unfortunately, there is no cure for infected plants and it is extremely difficult to prevent the spread of *Phytophthora* from an infested area. However, the risk of human activity spreading *Phytophthora* into new areas can be minimised using the management strategies outlined in the DEH Standard Operating Procedures for *Phytophthora* Threat Management, which apply to all users of reserves. These strategies are aimed at minimising the transfer of *Phytophthora* in soil, water and plant roots by controlling access, adopting hygiene procedures, modifying work plans and ensuring awareness of *Phytophthora.*

The potentially high level of recreational use (eg. by horses, bicycles and walkers) is also a factor here, given the means by which this disease is known to spread. A pro-active approach should be taken when selecting access routes and the installation of preventative devices at park entrances, as has been done elsewhere in the Adelaide Hills, may be a worthwhile measure. It is important to remember that Phytophthora is not the only threat that can be soil-borne. Good soil hygiene practices should be maintained through all works programs. Only soil or road-building material that is known to be free from pathogens, fungi or plant matter (including weeds and seeds) should be imported into, or moved around the park.

Objectives

Protect native vegetation, restore (where feasible) and reduce threats to biodiversity, particularly to communities of conservation significance.

Ensure any revegetation work undertaken is complementary to the existing, remnant native vegetation to ensure existing indigenous biodiversity and habitats are protected, and linkages to other remnant areas maintained or created.

Strategies

- Implement the Vegetation Management Plan against identified priorities; encourage natural regeneration and undertake revegetation, while integrating weed control programs according to the recommendations embodied in that plan. If necessary, review the existing Vegetation Management Plan in consultation with stakeholders.

- Develop and maintain partnership arrangements with other agencies, authorities, community groups and the owners of neighbouring properties to ensure that as far as is feasible, efforts at native vegetation management are integrated on a regional basis.
- Support and encourage the Friends of Sturt Gorge Recreation Park and other volunteer organisations and individuals, to continue regeneration/revegetation programs and to assist with monitoring species of conservation significance in collaboration with DEH. Continue to monitor and evaluate any programs undertaken.
- Manage significant vegetation for risk and biodiversity values.
- Take account of the potential for soil-borne pathogen and weed introductions/spread when planning public access routes (including the provision of information signs and cleaning stations) or management and development works (including track and trail construction) that may involve importing or movement of soil, or the use of heavy machinery.

5.4 Native Fauna

The spread of agriculture in the Mount Lofty Ranges after 1836 caused a dramatic decline in the number and abundance of native animals. Today, only a fraction of the pre-colonisation faunal biodiversity remains. Severe habitat modification through land clearing and the introduction of exotic species, both as predators and competitors for food and habitat, are believed to be the major factors contributing to the decimation of native wildlife.

Although Sturt Gorge Recreation Park is surrounded by residential properties and subject to disturbance from humans and their pets, it forms a useful habitat corridor. While it may provide only degraded habitat or revegetated habitat that is structurally and specifically different from the pre-colonisation condition, it still functions as a refuge and feeding area for many species of wildlife.

Birds seem to have fared the best, although a number of the avian species present at the time of settlement are now under threat or extinct. Some species have flourished with the alterations in habitat, benefiting from the revegetation efforts over the past three decades. DEH records show that 68 species of birds have been recorded in the park (sixty of which are native to the area), while some reports from the SA Ornithological Association (1970s – 2003) suggest that as many as 90 species may inhabit the park. The majority of bird species recorded are principally associated with the wooded habitats of the park.

While the park is not located within the natural distribution range of the Koala (*Phascolarctos cinereus*), they are often seen in the park. Lizards and snakes are common and it is known that tortoises inhabit the dam on Craigburn Farm.

Little direct management effort can be directed towards native fauna until habitats are restored, and threats abated. During the term of the new plan, park managers and groups undertaking vegetation management need to remain cognisant of the habitat requirements of native fauna species. Protection of existing habitat needs to be taken seriously, especially for the aquatic and amphibious species that inhabit the Sturt River and its tributaries.

Objective

Identify indigenous fauna inhabiting or using the park and protect threatened species.

Strategies

- Integrate fauna habitat restoration with native vegetation regeneration and revegetation efforts and pest plant management programs.
- Encourage approved volunteer groups and individuals to conduct fauna surveys and undertake population monitoring. Investigate opportunistic sightings to verify species identification.

5.5 Introduced Plants

Although Sturt Gorge Recreation Park has distinctive visual qualities, much of the park is dominated by introduced vegetation. Despite decades of weed removal effort, the park still supports a diverse population of non-indigenous plants.

In cleared areas, native grasses have mostly been replaced by exotic pasture species. The diversity of exotic species is significant along the banks of the creeks and Sturt River and species found in the riverine environments included Desert Ash (*Fraxinus rotundifolia*), Fennel (*Foeniculum vulgare*), Blackberry *(Rubus ulmifolius*), Hawthorn (*Crataegus monogyna*) and Willow (*Salix sp.*). Other exotic species of more general distribution throughout the park include: European Olive (*Olea europaea*), Boneseed *(Chrysanthemoides monilifera*), South African Daisy (*Senecio pterophorus*), Broad-leaved Cottonbush (*Asclepias rotundifolia*), African Boxthorn (*Lycium ferocissimum*), Aleppo Pine (*Pinus halepensis*), Salvation Jane (*Echium plantagineum*), Soursob (*Oxalis sp.*), St. Johns Wort *(Hypericum perforatum*), Wild Onion (*Asphodelus fistulosus*), Cape Weed (*Arctotheca calendula*), and Cape Tulip (*Homeria collina*).

Pest plant removal projects have only had limited success in restoring native plant diversity and require follow-up work and monitoring. On the other hand, smaller scale projects focussed on areas of higher biological integrity have been more successful in increasing native plant diversity and require a lower commitment of recurrent funding. More recently weed control programs with a more directed conservation focus have been initiated in a number of areas throughout the park.

Fuel reduction slashing, burning and chemical spraying have been conducted annually to protect park assets and surrounding residential areas from the threat of wildfire, particularly along the southern boundary. Some fire prevention strategies, such as the extensive removal of Olives from along Broadmeadow Drive have also facilitated regeneration of native species, but some areas that have been annually slashed, burnt or sprayed now have a higher incidence and diversity of introduced plants.

In 1997 a partnership between DEH and the then Patawalonga Catchment Water Management Board was formed, aimed at instigating a project to remove woody weeds below the flood mitigation dam on the Sturt River to improve water quality by reducing biological pollutants. Targeted species included Desert Ash, Broom, Blackberry, Olive, Dog Rose, Fennel and Figs. The impact of this project on the recovery of native plant species and the ecology of the riparian system has not been monitored, but it is recognised that an integrated follow-up program is necessary to ensure natural biodiversity is not adversely affected. As part of the Native Vegetation Council's approval for the wet detention basin, the Patawalonga Catchment Water Management Board contributed significantly to the control of olives along the Sturt River near the flood mitigation dam. Some of the areas targeted for weed control were on land added to Sturt Gorge Recreation Park in 2001.

Partnerships between DEH and the Urban Forest Biodiversity Program (UFBP) have also contributed to the control of environmental weed species in targeted areas. Projects have included the removal of olives from the park's lower western facing slopes and the north-eastern slopes. Woody weeds have also been targeted in the western portion of the riparian zone.

In 2001 the Metropolitan Parks Program (Woody Weeds Project) removed Aleppo Pines and olives from a target area on the north-western slopes of the park. This work has significantly reduced the cover of these species in the target area.

Since 1999 the Friends of Sturt Gorge Recreation Park have contributed significantly to the control of environmental weeds in the park. In 2001 the strategies of the group were focussed on restoring native vegetation in the Sturt River/Magpie Creek junction area. Since then sites along Broadmeadow Drive, Flagstaff Hill, and Gorge Road/Bushland Drive, Bellevue Heights have been the focus of ongoing exotic plant removal. In both areas the diversity and cover of native species has increased, and the incidence of exotic plant species has reduced considerably.

The extent of the environmental weed problem necessitates that priorities be set for any control work conducted on the subject land. Control efforts should be concentrated to the priority zones indicated in the Vegetation Management Plan, in those areas of highest biodiversity value where reasonably intact native vegetation remains. They should also be integrated with habitat regeneration activities. Actions should focus on species that have the greatest potential threat to the biodiversity of this park, as listed in the Vegetation Management Plan.

Weed control programs on park should be progressed according to priorities outlined in the Vegetation Management Plan. To achieve these outcomes, DEH has and will partner other agencies, community groups and landowners adjacent to the park in 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. DEH should inform park neighbours of invasive species likely to enter the park, via appropriate methods (eg information sheets) where feasible. Management programs should be monitored and evaluated. Longer term, to effectively manage the threat of weed reintroduction, a regional integrated weed control program is required, involving the owners/managers of surrounding properties, the Cities of Mitcham and Onkaparinga, AMLRNRM Board and DEH.

While removing non-indigenous plants is accepted practice in reserves, DEH recognises the need to conserve trees and vegetation that have significance for either natural or cultural reasons. Large non-native species may be protected as 'significant trees' if they meet the criteria of the *Development Act 1993* (trunk circumference of two metres or greater). Non-indigenous trees may be historical plantings and could be of historic value and therefore part of the park's cultural heritage. However, 'tree-damage' as outlined in the *Development Act 1993* (the killing or destruction of a tree; the removal of a tree; the severing of branches, limbs, stems or trunk of a tree; the ringbarking, topping or lopping of a tree; or any other substantial damage to a tree) will be allowed where deemed appropriate for management of biodiversity or risk.

DEH policy for plants recognised as historic is that they can remain, provided they are non-invasive or at least manageable. If species are by nature invasive (eg Ash, Hawthorn) they should be removed. Significant trees that are retained may be given proper arboricultural treatment, so that they remain in good health. However, where a tree is causing damage to property or is considered a public risk, appropriate steps must be taken to ensure safety requirements are maintained. In those situations, advice on their cultural or horticultural importance should be obtained from knowledgeable persons and any necessary approvals obtained before a decision is taken for retention or removal.

Objective

Control introduced plants posing a threat to biodiversity so that degraded environments, particularly the Sturt River and other water courses, are restored.

Strategies

- Implement the Vegetation Management Plan against long-term, achievable and measurable goals and include programs for coordinated pest plant control, land rehabilitation and revegetation with native species of local provenance.
- Work in cooperation with adjoining landowners, AMLRNRM Board, the Cities of Mitcham and Onkaparinga, the Friends of Sturt Gorge Recreation Park and the local community to achieve effective pest plant control, combining weed control with habitat regeneration efforts at a landscape scale. When contracting other organisations, ensure teams are adequately trained and supervised and use best practice methods.
- Monitor and evaluate the effectiveness of control programs.
- Provide adequate protection for any significant trees and collaborate with the Heritage Branch of DEH, Cities of Mitcham and Onkaparinga and other authorities to identify trees/plants considered significant for historic or horticultural reasons, or deemed to be 'significant' under the *Development Act 1993* and/or the *Heritage Places Act 1993*. Lop or remove exotics where necessary for biodiversity and/or risk management.

5.6 Introduced Animals

While no comprehensive mammal surveys have been undertaken for Sturt Gorge Recreation Park, a number of introduced mammal species occur in the wild throughout the Mount Lofty Ranges and have been seen in or near the park. The European Rabbit (*Oryctolagus cuniculus*), Brown Hare (*Lepus capensis*), House Mouse (*Mus musculus*), Black Rat (*Rattus rattus*), and Red Fox (*Vulpes vulpes*) have all been observed. Cats and dogs (probably domestic strays) are common. Introduced bird species are also common.

Predators such as foxes and cats have had a considerable impact on indigenous fauna and invertebrates. Careful management through integrated pest control programs is the best way to ensure that pest animal numbers are reduced with minimal impact on native flora and fauna.

Given the park's proximity to residential properties, broad-acre baiting programs are unlikely to be feasible. There may be opportunities in the future to cooperate with regional authorities and neighbouring land-owners to develop acceptable control programs. Pest animal control should remain on the management agenda.

Objective

Control introduced animals and mitigate their deleterious impacts on park values.

Strategies

- Undertake surveys to determine the extent of introduced animal populations and their relative impact on native flora and fauna.
- Monitor introduced animal populations within the park and devise pest control programs in accordance with priorities, taking into account the benefits versus the costs of possible adverse impacts to native wildlife and other off-target impacts of such programs.
- Work in cooperation with adjoining landowners, AMLRNRM Board, the Cities of Mitcham and Onkaparinga, the Friends of Sturt Gorge Recreation Park and the local community to achieve effective pest animal control.

6 MANAGING FIRE

Historical records show that during most summers prior to the park's proclamation in 1973, small fires occurred in Sturt Gorge. That pattern appears to have continued, with small fires (up to two hectares in extent) occurring every few years since then.

Fire is now known to be one of the most important natural environmental variables in determining the structure and composition of Australian vegetation, and maintaining biodiversity conservation. It is also recognised that Aboriginal people commonly used fire for habitat manipulation, although the actual extent of any such activity in the Sturt Gorge area is unknown to DEH as past land use has masked any evidence of Aboriginal fire. Use of fire as a means of hazard reduction and habitat manipulation has not been applied to a great extent in this park, but may be used more in the future subject to safety considerations. Where possible, integrating any such activity with the management of adjoining land would be ideal.

Fire management is a key component of park management. This is especially true of Sturt Gorge Recreation Park, in view of the close proximity of neighbouring properties (including aged care facilities) and suburban residential areas. Furthermore, the park is located in the bushfire prone Mount Lofty Ranges. As the park management plan does not enter into the detail necessary to plan for fire management, a fire management plan that incorporates the park has been prepared. DEH prepared the *Draft Reserves of the Southern Foothills, Mount Lofty Ranges Fire Management Plan* (2007), in consultation with adjoining Country Fire Service Groups and District Bushfire Prevention Committees, to integrate district fire management. Stakeholders and the wider community were consulted to ensure an understanding of the fire risks and mitigating strategies being proposed or undertaken in the park.

The fire management plan:

- identifies natural and cultural heritage values and built assets;
- provides a framework for the management of bushfire suppression, including identification of strategic access and control lines; and
- provides a framework for prescribed burning for ecological management and fuel reduction purposes.

Solid-fuel fires are not permitted in the park. No gas barbecues may be used, except with approval from the park manager for organised events, or on leased areas. On leased areas, wood fires may be permitted (outside of the fire danger season) subject to the prior approval of the District Ranger. Should fixed barbecues be installed in the Recreation Zone, these will be available for use except on days of extreme fire danger.

On days of extreme fire danger, the Director of National Parks and Wildlife has the authority to close reserves under the *National Parks and Wildlife Act 1972*. In emergency conditions, the State Coordinator (Commissioner of Police) may close reserves under the *Emergency Management Act 2004*.

Objective

Manage fire to ensure the protection of life and property, the maintenance of biodiversity and the protection of natural, cultural and built values.

Strategies

- Implement and review the existing *Draft Reserves of the Southern Foothills, Mount Lofty Ranges Fire Management Plan* (2007) in association with CFS and other stakeholders.
- Continue to work with relevant District Bushfire Prevention Committees and CFS to minimise risk to life and property within and surrounding the park.
- Continue to undertake annual fire prevention works and use planned fires, where appropriate, to reduce fuel hazards with the aim of protecting life and property.
- Use applied fire as a biodiversity management tool if research indicates that it is appropriate, and burning can be undertaken safely.
- Ensure visitors comply with any fire restrictions by providing information and monitoring visitor use.
- Prohibit the use of solid fuel fires all year round, other than in leased areas where wood fires may be permitted subject to the approval of the park managers.

7 MANAGING CULTURAL HERITAGE

7.1 Aboriginal Heritage

Kaurna Culture and Heritage

The land comprising Sturt Gorge Recreation Park forms part of the 'Country' of the Kaurna people (Tindale, 1974). The significance of land and waters for Kaurna people is central to their lives: at birth, death, ceremonies and socially, whilst hunting, gathering camping, and travelling. The Warriparinga area, just downstream from Sturt Gorge Recreation Park, is of great spiritual significance to Kaurna people through its connection with the Tjilbruke Dreaming. It was here that Tjilbruke found the dead body of his nephew and, later, avenged his death. Warriparinga is linked spiritually to the spring at Kingston Park and to the other sites on the Dreaming Track along the south coast and in Fleurieu Peninsula. Most Kaurna people regard the Tjilbruke Dreaming, and the sites associated with it, as one of the most important elements of their cultural heritage and identity.

Following colonial settlement, the Kaurna population was substantially reduced as a result of introduced diseases, dispersal, dispossession of their land and water supplies, and sometimes through violent conflict.

Today, Kaurna people live on their country and practise their culture and language. Some of the language and traditional stories have been recorded. However, to date, the full extent of Aboriginal heritage at Sturt Gorge Recreation Park has not been comprehensively researched.

However, due to historical or cultural reasons, any knowledge 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 purpose of the *Aboriginal Heritage Act 1988* is the protection and preservation of Aboriginal sites, objects and remains. "Aboriginal site" and "Aboriginal object" are defined under the Act as "an area of land or an object that is of significance according to Aboriginal tradition; or that is of significance to Aboriginal archaeology, anthropology or history." The Aboriginal Affairs and Reconciliation Division (AARD) of the Department of Premier and Cabinet maintains a Central Archive, including the Register of Aboriginal Sites and Objects.

Although there are no sites listed on the Central Archive for Sturt Gorge Recreation Park, a comprehensive survey of the park is yet to be undertaken. In carrying out the activities and strategies proposed in this plan, DEH will ensure that it complies with the *Aboriginal Heritage Act 1988*.

To ensure the protection of cultural heritage sites, DEH staff will consult with AARD and the relevant regional Aboriginal heritage committees before commencement of any development works.

Objective

Ensure that any Aboriginal sites, objects and remains are protected and preserved in accordance with the *Aboriginal Heritage Act 1988*.

Strategies

- Recognise the continuing association of the Kaurna people with the Sturt River and its environs.
- Consult with the relevant regional Aboriginal heritage committees and relevant Government Aboriginal heritage authorities in decisions regarding the management of Aboriginal heritage.
- Identify and protect any Aboriginal sites, objects and remains in cooperation with the traditional owners, AARD and relevant authorities.
- In consultation with the traditional owners, submit cultural sites and stories that relate to the park for inclusion on the AARD Central Archive.

7.2 Non-Aboriginal Heritage

Prior to it being proclaimed a reserve, the land was used for farming (mainly grazing and cropping), mining and woodcutting. Before Word War I and again during World War II, the area was used by the military for training purposes. There are some sites and objects still evident on the land that relate to its prior history, and further surveys are planned.

The Department of Archaeology at Flinders University has completed a survey of the Hills Face Zone that included Sturt Gorge (Flinders University of South Australia, 2002). Investigations have revealed the presence of stone ruins, possible habitation sites and old trails, as well as the remains of shell holes, wire entanglements and trenches of military origin.

It is important that the process of historical documentation continues, and sites and objects of significance are protected and appropriate interpretation material provided for visitors. DEH should continue to support and encourage ongoing survey and research, as well as site stabilisation. The scope of any investigation should include the Craigburn Farm land, which has its own history of land use. Minda Inc. may wish to be involved in that process.

Objective

Conserve cultural and historical sites and objects of significance.

Strategies

- Identify, research and assess sites and items of archaeological, cultural, historical and biological/horticultural significance located in the park, in consultation with the knowledgeable persons, the Cities of Mitcham and Onkaparinga, the Heritage Branch of DEH and other relevant bodies.
- Stabilise, protect and manage public risk associated with designated sites or objects of cultural significance, using appropriate measures, and monitor site condition on an ongoing basis.
- Support the survey and inventory of historic sites and stories that relate to the history of the park area, and undertake a non-indigenous cultural heritage survey on the Craigburn Farm land added to the park.
- Where appropriate, make this information available to visitors by preparing, displaying, maintaining and upgrading interpretive information including cultural heritage themes, to increase public awareness.

8 MANAGING RECREATION

Sturt Gorge Recreation Park is used mainly by local residents for walking, nature study, orienteering, sightseeing, dog exercising and general relaxation. Horse riding is popular in the local area, but was not a permitted activity in the park in the past. Mountain bike riding, while similarly not permitted in the past, is increasing in the park.

The park is also used for educational geological excursions. The geological features are a key educational resource and universities and other tertiary institutions constitute a significant user group.

The Craigburn Farm land has been used by horse riders (prior to its addition to the park, Riding for the Disabled (RDA) leased part of the area from Minda Inc.). Other recreational activities that have taken place on Craigburn Farm were relatively minor and either informal or took place by arrangement with Minda Inc. (eg use by tracking dog groups).

There have been no recent visitor surveys undertaken, but observations by park staff suggest a reasonably constant visitor use that has steadily increased over the term of the first management plan. This probably reflects both a general community trend of increasing participation in outdoor recreation and expanded residential development in the local area. Quantifiable and current visitor information needs to be obtained.

The use of the park by people living away from the immediate area has not been quantified but would appear to still be relatively small. Few problems apart from minor vandalism have resulted from inappropriate visitor behaviour, but fire lighting remains a perennial threat.

The park's topography and lack of facilities tends to constrain the diversity and extent of visitor use. Recreational trail use in most parts of the park involves negotiating steep to very steep grades. There are only limited areas of flat ground suitable for the development of facilities that could diversify recreational usage. Moreover, many local residents have indicated that they are opposed to intensive, built development, because they value the park for its natural qualities and undeveloped visual amenity. They do not wish to see these values compromised but are not opposed to maintaining and expanding recreational trail opportunities. There are some flatter areas on Craigburn Farm that if added to the park would enhance the capacity to cater for a diversified range of recreational opportunities.

It can be anticipated that recreational use of this park will continue to evolve and increase, in parallel with changing community interests and recreational trends. The majority of recreational activities currently taking place in the park are considered appropriate for the future. In South Australia, walking and cycling are two of the most popular forms of unstructured, active recreation. Effective management of the recreational use of the park will be needed to ensure that a diversity of activities continues to be accommodated and the area is linked into regional networks (eg the Sturt River Linear Park). It is important that conflict between different forms of park use is alleviated and any impacts on landscape and natural and historic values are minimised. Furthermore, public risk management is a critical factor that must be addressed when considering what are appropriate recreational activities. The park's purpose is intended to be for unstructured active recreation by groups and individuals, rather than structured recreation and sport. There is no intention for the provision of ovals, tennis courts or similar built sporting facilities.

Trail access and visitor facilities and services require detailed planning for proper implementation. A Trails Master Plan and a Visitor Facilities and Services Plan will be prepared for the park. These plans will be prepared by DEH in consultation with all relevant stakeholders.

8.1 Visitor Access

Most visitors access the park on foot and pedestrian entry is readily available at a number of points around the perimeter. For example, persons can enter, via steep trails, from Broadmeadow Drive, Bonneyview Road, The Boulevard and Black Road. The off-road parking area off Broadmeadow Drive was enlarged during the term of the first management plan and remains the only designated car parking facility. Elsewhere, visitors park their cars on the road verges.

There is a trail link from the Blackwood Hill Reserve that is used by walkers and mountain bikers. This adjoining reserve and associated trails are linked to public rail access and to nearby parks and reserves. Provision for access into the park needs to be factored into the planning for the Stage 2 residential development to the east of the Craigburn Farm land additions. Facilities for parking

and park entry will be addressed as part of the Visitor Facilities and Services Plan. For any such development, consideration must be given to traffic management in the area. Although the facility would be low key with minimal visitor use and impact, planning constraints may exist that would restrict some aspects of such a development. DEH staff must liaise with Planning SA and the Cities of Mitcham and Onkaparinga Councils when planning this development.

Walking Access

The trails and management access tracks provide opportunities to explore the park on foot. The Warri Parri and Gorge Walking Trails are two of a number of designated pedestrian routes. The construction of additional walking trails was not considered necessary at the time of preparation of the first management plan, but the situation changed and a network of walking trails has been established. Trails SA, the Government trail marketing entity, has currently identified four hikes of varying lengths and difficulty.

Planning for future visitor use aims at accommodating current and future patterns of use with minimal impact upon the park environment. In this regard, DEH will liaise with community user groups to assess future demand for walking trails within the park. Existing tracks/trails should be incorporated wherever possible, and care taken with the siting of any new routes to minimise impact on the environment.

Visitor access to trails should continue to be permitted with no times of opening/closing imposed (except for days of extreme fire danger). However, it may prove necessary to set some opening and closing times on car-parking areas. On-park trails should be linked into regional networks and thus to other reserves in the region. An example is the Sturt River Linear trail network that will cater for walkers and other recreational through-access. This trail will be implemented as described in the Sturt River Linear Park Master Plan, subject to modification of the route if necessary to ensure sustainable guidelines are satisfied. This will occur as part of DEH's trails master planning for the park, which will be undertaken in conjunction with key stakeholders.

Other Access

With the exception of the vehicles of emergency personnel, park managers and approved persons (such as approved volunteers, workers and lessees) motorised recreational and off-road vehicles are not permitted in the park. Access points for fire-fighting and emergency vehicles need to be designated and gates installed in any (new) boundary fencing. Additional equestrian/bicycle entrances could be installed at several locations around the park boundary.

Proliferation of trails in parks can become a major issue in circumstances where demand is high and not managed properly. Given the current trends in recreation, increased residential populations and the demographics of the locality, it can be anticipated that the park will experience a steady increase in demand for recreation access, particularly to the trail network.

To facilitate this potential growth, a Trails Master Plan will be prepared to assess existing trail opportunities, identifying the suitability of existing trails, any actions required to make them sustainable for future use, the necessary closures or re-routing, and any new trail development to link with other trails or to provide sustainability outcomes. This assessment will also need to make some decisions as to whether all trails in the Recreation Zone are to be multi-use and multi-directional or whether some trails should be single use only. Part of that process will be to upgrade signs and other information sources for visitors to ensure that they are well aware of the values of the park and appropriate behaviour. Where feasible, provision will be made for disabled access, but the steep terrain limits the opportunities for this. Trail use should be monitored on an ongoing basis.

While it remains under the management of SA Water, following recent works, the public may now safely access the dam wall; however, access to the trash rack (managed by AMLRNRM), on the northern side of the dam remains prohibited. In addition, SA Water is to retain ownership of the water body immediately upstream of the dam wall. The exact boundaries and management arrangements for this area of land will be determined (see Section 9 Managing Reserve Tenure).

DEH will continue to liaise with SA Water regarding the potential for managed public access.

Objective

Provide for public enjoyment of the park in a way that is compatible with the conservation of natural and cultural values.

Strategies

- Prepare and implement a Visitor Facilities and Services Plan.
- Implement traffic management studies prior to the development of any car parking and facilities areas.
- Establish a Trails Master Plan to provide clearly defined routes for various recreational pursuits while eliminating duplication and reducing impacts on park values.
- Establish and maintain liaison with the Cities of Mitcham and Onkaparinga, horse riding, bicycle riding and other specialist user groups, universities, schools, Scouts and event organisers.
- Allow bicycle riding, horse riding and walking only on designated trails; monitor use and impose effective control measures to restrict access in erosion sensitive areas.
- Develop a project (possibly with a tertiary institution) to survey and monitor visitor numbers and satisfaction levels.
- Allow for the facilitation of the Sturt River Linear trail network through the park.
- Continue to liaise with SA Water to explore options regarding the potential for managed public access across the dam wall.

8.2 Visitor Activities

Dog Exercising

Dogs may enter reserves on lead under the control of their owner, where this has been permitted under the *National Parks and Wildlife (National Parks) Regulations 2001*. Dogs are not permitted off lead to ensure public safety and peaceful enjoyment, as well as the preservation of wildlife. However, beagles and other tracking dog groups have been regularly using the Craigburn Farm area and that use may continue subject to negotiated conditions, with the prior approval of park managers. Dogs will not be permitted off lead in the Conservation Zone. Dog-related activities should be monitored.

Bicycle Riding

Mountain bike riding is an increasingly popular recreational activity. Off park, opportunities for mountain bike access within the region are being facilitated through the City of Mitcham's Mountain Bike Strategy. While not currently a permitted activity, Sturt Gorge Recreation Park is utilised for cycling and this demand is expected to increase in line with trends in recreation. It is proposed that mountain bike riding will be accommodated in the Recreation Zone where possible, subject to compliance with sustainable trail design criteria. This will be developed in consultation with the community and peak recreational and other relevant community interest groups (such as conservation groups and mountain bike clubs), and should complement the City of Mitcham's Mountain Bike Strategy.

The desire by some mountain bike riders to use all existing trails is an issue that will need to be balanced by sustainable environmental and social considerations. Delineation of the trails most suitable for various activities will be required. Trail use should be monitored and the 'code of conduct' promoted for bicycle riders in the park. Cycling will be prohibited in the Conservation Zone. However, the Trails Master Plan may identify that the route for the Sturt River Linear trail network will pass through the Conservation Zone, in which case it will be the only multi-use trail within the zone. The trail would meet sustainable trail guidelines and environmental impacts would be managed (see Section 4 Zoning).

Horse Riding

The terrain of Sturt Gorge was generally considered ill-suited to horse riding and this activity has not been permitted. The addition of the Craigburn Farm land may provide more suitable terrain and a route linking up with the Tom Roberts Trail could be designated through that area.

A draft code of practice for horse riders was jointly developed between DEH, Horse SA and local riders some years ago, but has not been finalised. It may be worthwhile re-visiting this document and consulting horse owners as part of that process. Trails suitable for horse riding should be delineated through the Trails Master Plan and information signs should be erected where necessary. Horse-oriented information should be provided for riders and advice sought from Horse SA in this regard. Any trail use by horses should be monitored. Horse riding will be prohibited in the Conservation Zone.

Liaison with local government authorities, as well as with horse-riding groups, should be initiated and maintained in planning for any horse trail access through the park. The impact of this particular activity should be monitored and the appropriateness of access routes reviewed from time to time, to ensure adequate protection for the park environment.

Picnic, Barbecue, Toilet and Day Use Facilities

Solid fuel barbecues are not permitted due to the lack of available wood and the high fire risk. Use of the park for picnics is currently minimal, because there are no facilities where barbeques are provided. Over night camping and campfires are prohibited.

Some relatively modest facilities are proposed for Sturt Gorge Recreation Park during the term of this management plan. It is proposed that basic car parking and interpretation signage facilities, along with picnic tables and shelters, may be provided. Tables, seats and signs may be installed at other entrances and at locations along the trails if demand warrants. Construction of facilities will be prioritised against statewide demand. The exact details will be included in a Visitor Facilities and Services Plan, which would be developed in consultation with stakeholders.

Other Recreational Activities

Sturt Gorge Recreation Park is mainly used for casual recreational activities that do not require permanent facilities. As well as walking, horse and bike riding mentioned previously, other uses include jogging and cross-country running, orienteering, and nature study. There are reports of persons swimming in water bodies in the park and on Craigburn Farm. Banning visitors from all water contact is not warranted, but swimming should be prohibited for reasons of public risk management. Overnight camping is not permitted.

Organised cross-country running and orienteering events are occasionally held in the park. An orienteering map is available for Craigburn Farm. These activities will continue to be permitted (seasonally only in the Conservation Zone) but their impact on the park will be monitored. If the impact on sensitive areas goes beyond acceptable limits, such areas will be precluded from future events. Organisers of these activities should discuss course routes with the park manager prior to the events, and obtain approval beforehand.

Local schools and Scout groups regularly use the park and have been involved in revegetation activities. Camping should not be permitted due to the close proximity to residential settlement, but other types of Scout activity may be acceptable, but should be discussed with the park manager prior to undertaking them. Bonfires are permitted on the Scout lease area (outside the fire danger period), with the prior approval of the park manager.

The geological sites and revegetation/weed control programs have potential for involving local school students to assist in management while at the same time giving participants a recreational and education experience. Developing closer (and potentially mutually beneficial) relationships with tertiary institutions, particularly Flinders University is also seen as being most worthwhile. Rock samples must not be taken from the State Heritage Place.

When new recreation or sport activities are proposed and when licences or permits for existing activities are renewed, DEH managers shall assess each proposal without prejudice and on its merits. DEH will continue to consult with the community and relevant stakeholders regarding recreation management within the park.

Objective

Provide for sustainable and safe recreation activities in the park while minimising visitor impacts on natural values.

Strategies

- Support and encourage appropriate recreation events in the park.
- In consultation with Bicycle SA, promote the Code of Conduct for bicycle riders.
- In consultation with Horse SA and local riders, develop and implement a horse riding code of conduct if necessary. Any horse riding permitted in the park will occur on designated trails to avoid sensitive areas and minimise environmental impact.
- Ensure that all visitors with geological interests refrain from collecting samples of and damaging the Sturt Tillite.

8.3 Information and Interpretation

By maintaining signs and providing other information sources for visitors, DEH can ensure that visitors are well aware of the values of the park and appropriate behaviour. The preparation of a Visitor Facilities and Services Plan can guide the provision of interpretation and information.

Sturt Gorge has a number of geological characteristics of particular significance that could warrant the development of interpretative information. However, the comparatively minor visitor use of this park and priorities for interpretive information elsewhere in the reserve system, makes geological interpretation of Sturt Gorge (beyond basic visitor information) a low priority in the near future.

Information and interpretation signs can be integrated with trail development to enable visitors to better appreciate park values, to point out various features of interest and to explain current management programs and access restrictions. Signposting will be required to make the public aware of boundary alterations.

Objective

Provide information and interpretation to indicate park boundaries and features of interest to further visitor understanding and appreciation of the natural and cultural environment, and to encourage behaviour protective of park values.

Strategies

- Provide signposting to educate users of park zoning and regulations.
- Integrate interpretive information with trail development.
- Consider a self-guided interpretive trail that focuses on geology.
- Provide and regularly update information signs and interpretive material to encourage visitors to use existing walking, cycling and horse riding trails and to avoid erosion-prone areas.
- Install and maintain signs and other information sources for visitors to ensure that they are well-aware of the values of the park and appropriate behaviour.

9 MANAGING RESERVE TENURE

At the time of adoption of this management plan, the park's boundaries are as shown in Figure 2, however there are a number of proposed land exchanges, which are also identified, along with the proposed park boundary. The proposed additions to the park have been agreed to in principle by DEH, Planning SA, SA Water and the Cities of Mitcham and Onkaparinga, subject to particular conditions being satisfied, and will be proclaimed and managed in accordance with this plan of management.

The dam to the east of the park within the proposed Craigburn Farm additions represents a potential safety risk and will be suitably managed by DEH (Figure 2). Part of the agreement with Planning SA provides for the dam to be landscaped in such a way that discourages people from the edge of the dam. In addition, a small area of Sturt Gorge Recreation Park has been identified as a possible Onkaparinga City Council reserve, as part of the proposed land exchanges.

Three small areas of the former Craigburn Farm land have been identified by the City of Mitcham as land over which it wishes to have care and control to enable stormwater management and facilitate a land swap to achieve community recreation and open space areas within the development area (Figure 2).

Through the land exchanges, there will be no net loss of open space and Sturt Gorge Recreation Park will increase in size by approximately 200 hectares, resulting in a park 444 hectares in size. Following these changes in the park's boundaries (including the addition of most of the Craigburn Farm land previously owned by Minda Inc. and the reduction in the amount of land surrounding the dam controlled by SA Water) little extra land is being considered for addition to the park for the term of this management plan.

Any land formally added to the park would be subject to and managed in accordance with this plan of management.

Objective

Achieve conservation and recreation outcomes with the most appropriate land tenure and by integrating the management of the park with the management of other nearby open space land in the immediate vicinity of the park.

Strategies

- Undertake the proposed land exchanges that have been agreed to in principle between DEH, Planning SA, SA Water and the Cities of Mitcham and Onkaparinga, by adhering to the necessary conditions and legislative requirements.
- Manage added land in accordance with zoning and other principles outlined in this management plan.

9.1 Leases and Licences

The Flagstaff Hill Scout group leases a small area of park land off York Drive. That leasing arrangement should continue for the term of this management plan.

It should be noted that stock grazing may need to continue on the Craigburn Farm land in line with the Rehabilitation Plan for Craigburn Farm, as a grassland/fire hazard management strategy until native vegetation can be re-established.

Longer term, the Craigburn Farm additions could potentially accommodate a range of recreational uses. Leasing may be the best way to ensure maintenance and management of some of that land. Depending on the type of activity, DEH could enter into leasing negotiations with parties interested in assuming control of land, provided that such leasing does not alienate the land and buildings from community benefit and enjoyment.

Objectives

Ensure that leases and licences do not compromise park values.

Strategies

- Set lease conditions and monitor compliance as required, ensuring lease operations are consistent with protecting park values.
- Review or monitor the effect of grazing management on the Craigburn Farm land added to the park.

9.2 Public Utilities

Sewage and water mains run through and around the park boundary and are subject to access rights by SA Water. A major power line crosses the park in a north-south direction in the vicinity of Starlight Crescent and is subject to access rights by ETSA Utilities staff and contractors. There are no other utility services actually routed across park land, but infrastructure supplying electricity, telecommunications, gas and water is located on the road reserves around the park boundaries and in residential areas immediately adjacent.

It is important that the ongoing operation of any easement does not detract from park values. While there is potential for park maintenance work to damage utility services, there is equally the potential for park assets to be degraded by maintenance work undertaken by utility companies. To avoid these problems, DEH needs to maintain liaison with utility managers to ensure that maintenance or development works neither interfere with utility services nor impact on park values. Trees that interfere with overhead power lines can create a fire hazard. ETSA Utilities (or other responsible agency) needs to make sure that overhanging trees within the park or around the park boundary are lopped and maintained in a professional manner.

A number of stormwater traps are or will be located on the boundaries of the park and in some places there is direct suburban run-off into the park. Requirement for and future operation of these facilities should be subject to liaison with the Cities of Mitcham and Onkaparinga and the AMLRNRM Board (see Section 5.2 Hydrology). SA Water maintains a number of sighting points on park land external to the Flood Control Dam from which any movement of that structure can be determined. Access to those sites should continue to be permitted. While the Flood Control Dam remains on SA Water land, DEH staff should liaise closely with SA Water staff and contractors to ensure safe operation and maintenance of the dam at all times. Some SA Water operations may require access to sections of the Conservation Zone. This access will be granted on a case by case basis, with close liaison between DEH staff and SA Water staff/contractors.

There is also a possibility that in the future, requests will be made to locate additional utility services in the park. It is impossible to canvass the range of possibilities in this management plan, but in general terms, DEH remains opposed to the location of additional infrastructure on parks except under very special circumstances. Protection of park values should be seen as the priority and reserves should not be taken as the easy option because they are public land and somewhat remote from residential areas.

Any proposal for new utility infrastructure should be reviewed in conjunction with the prevailing DEH policy. A community and environmental cost-benefit analysis should be mandatory before a decision is taken to locate infrastructure on reserve land. Provided that on balance a proposal is of positive community benefit and complies with DEH policy, a grant of approval may be deemed to accord with this management plan.

Objective

Ensure the location, operation and maintenance of utility services within and adjacent to the park does not compromise park values.

Strategies

- Maintain accurate records of utility services, particularly underground facilities, to minimise the potential for damage through park maintenance and future development works.
- Maintain liaison with other agencies and utility companies and periodically review access requirements and maintenance programs.

10 INVOLVING THE COMMUNITY

DEH recognises that partnerships and cooperative management arrangements represent the best way to progress integrated natural resource management. Achieving this plan's objectives and best outcomes relies on the development of effective working relationships with other Government agencies, local authorities, non-government organisations and local communities. Such partnerships can create synergies that further the development, maintenance and management of a park (integral with the management of adjacent land) and strengthen resourcing and funding capability. Developing and maintaining a regional approach to management is the current strategy being pursued by DEH. For the term of this management plan, developing and maintaining cooperative management partnerships with the owners or managers of nearby land is considered essential to achieve an integrated approach.

Friends and Volunteers

Volunteer support and community-based involvement that conserves and improves biodiversity and cultural values, and establishes quality management of recreational use, has become an essential component of park management. DEH acknowledges and supports the active volunteer contribution of the Friends of Sturt Gorge Recreation Park in the management of the park.

It is important for DEH to continue communication with Friends members, provide support and assistance, including legal and policy advice, technical, planning and management direction.

The Friends of Sturt Gorge Recreation Park is an active community group supporting park management programs that has already had success in weed control, revegetation and encouraging natural regeneration in Sturt Gorge. It would be most desirable to maintain that sense of involvement and commitment.

Volunteers require materials, equipment and oversight by park staff. Therefore, it is important for DEH to maintain liaison with any volunteers to provide support and encouragement, and to ensure their efforts are consistent with park management objectives and work programs, including the work of other volunteer groups. There is a role for a volunteer coordinator and an annual forum to exchange ideas, raise awareness and set management direction.

Other organisations and individuals including adjoining property owners can and do contribute to habitat restoration, revegetation and weed control projects in support of park management. DEH recognises that it must coordinate priorities for conservation effort, in consultation with the Friends of Sturt Gorge Recreation Park, adjoining property owners, other volunteer organisations (eg Service Clubs) and individuals as required.

Regional Communities and Park Neighbours

The Cities of Mitcham and Onkaparinga both manage land adjacent to, or adjoining Sturt Gorge Recreation Park. As the major public land managers in the area, co-operation between DEH and the local Councils regarding matters of common interest is clearly desirable. For example, the best venues for various types of outdoor recreational activities and proposals for linking trails that may involve adjacent reserves would benefit from a united approach. Furthermore, weed and fire protection schemes and drainage management should ideally involve a coordinated approach on adjacent reserve land.

DEH supports and promotes partnerships and cooperative management arrangements to establish integrated natural resource management. This requires developing and/or maintaining linkages with Flinders University, Office of Recreation and Sport, AMLRNRM Board, Department of Correctional Services, Kaurna traditional owners, key community stake-holders (eg Horse SA, Walking SA, Bicycle SA) and local community groups.

Partnership arrangements should be developed to provide a positive direction for the shared development and management of the park to fulfil the objectives of this plan. Moreover, with changes in landuse within the region, it is important for DEH to actively work with the Cities of Mitcham and Onkaparinga and development bodies to ensure proposed developments do not adversely impact on biodiversity conservation and park values.

Local schools (eg Flagstaff Hill Primary) and tertiary institutions (eg Flinders University) have been or may wish to use the park for education and research and can contribute to better management. Therefore, involvement with educational institutions should be encouraged.

Aboriginal Partnerships

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

Objective

Develop and maintain partnerships between State and Local Government agencies, non-government organisations, recreational user groups and the community generally, in the management of the park and adjoining open space land.

Strategies

- Continue to work with the Cities of Mitcham and Onkaparinga and the AMLRNRM Board, and explore further the benefits of partnership arrangements to deal with areas and 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 representative Kaurna Aboriginal traditional owners in the management of the park and the preservation of their cultural heritage.
- Encourage the Friends of Sturt Gorge Recreation Park and other volunteer groups to feel a greater sense of partnership in the management of the park by consulting with them to review the direction of work activities based on the initiatives outlined in this plan of management, and integrate annual work programs of the Friends Group into the proposed management programs for the park.
- Encourage and facilitate the involvement of local schools and universities in research and volunteer programs.

SUMMARY OF MANAGEMENT STRATEGIES

ZONING
• Zone the park according to the above prescriptions. • Maintain heritage values within the State Heritage Place.
MANAGING NATURAL HERITAGE
Geology, Soils and Landform
• Educate visitors of the importance of the Sturt Tillite, and protect from damage. Allow no samples to be taken from the site. • Assess soil type and properties, including soil erosion potential, when planning for future management activities (eg vegetation removal), visitor access or when undertaking management and development works (including trail construction). • Maintain, improve, repair (or close temporarily, permanently or relocate) management access tracks and walking trails to stabilise soil as required. • Identify existing areas of erosion and undertake remedial works that may include storm water re-direction, public exclusion, and pest plant removal combined with natural regeneration or revegetation.
Hydrology
• Manage on-park (and engage with other authorities and neighbours regarding off-park) activities to minimise adverse impacts on the Sturt River hydrology and creek systems. In particular, ensure that existing park management and recreation activities are compatible with maintaining environmental and hydrological values. • Participate in regional catchment management programs, in partnership with the AMLRNRM Board and the Cities of Mitcham and Onkaparinga, in support of flood mitigation schemes, stormwater quality improvement and minimise any negative impacts to the park catchment. • In collaboration with the AMLRNRM Board continue the environmental restoration of the Sturt River. Collaborate with the AMLRNRM Board and other authorities to identify and repair existing areas of erosion through coordinated revegetation and pest plant eradication programs. • Incorporate a section of the Sturt River Linear Park though the park by making suitable provision, where appropriate, for walking and other types of public access for recreation, maintaining conservation values at all times. • Continue to encourage and support the involvement of volunteers in revegetation programs in riverine areas and (potentially) the monitoring of water quality. • Manage public risk associated with water quality and water management facilities and the nearby high-risk structure of the flood control dam and wet detention basin.

Native Vegetation
• Implement the Vegetation Management Plan against identified priorities; encourage natural regeneration and undertake revegetation, while integrating weed control programs according to the recommendations embodied in that plan. If necessary, review the Vegetation Management Plan in consultation with stakeholders. • Develop and maintain partnership arrangements with other agencies, authorities, community groups and the owners of neighbouring properties to ensure that as far as is feasible, efforts at native vegetation management are integrated on a regional basis. • Support and encourage the Friends of Sturt Gorge Recreation Park and other volunteer organisations and individuals, to continue regeneration/revegetation programs and to assist with monitoring species of conservation significance in collaboration with DEH. Continue to monitor and evaluate any programs undertaken. • Manage significant vegetation for risk and biodiversity values. • Take account of the potential for soil-borne pathogen and weed introductions/spread when planning public access routes (including the provision of information signs and cleaning stations) or management and development works (including track and trail construction) that may involve importing or movement of soil, or the use of heavy machinery.
Native Fauna
• Integrate fauna habitat restoration with native vegetation regeneration and revegetation efforts and pest plant management programs. • Encourage approved volunteer groups and individuals to conduct fauna surveys and undertake population monitoring. Investigate opportunistic sightings to verify species identification.
Introduced Plants
• Implement the Vegetation Management Plan against long-term, achievable and measurable goals and include programs for coordinated pest plant control, land rehabilitation and revegetation with native species of local provenance. • Work in cooperation with adjoining landowners, AMLRNRM Board, the Cities of Mitcham and Onkaparinga, the Friends of Sturt Gorge Recreation Park and the local community to achieve effective pest plant control, combining weed control with habitat regeneration efforts on neighbouring land. When contracting other organisations, ensure teams are adequately trained and supervised and use best practice methods. • Monitor and evaluate the effectiveness of control programs. • Provide adequate protection for any significant trees and collaborate with the Heritage Branch of DEH, Cities of Mitcham and Onkaparinga and other authorities to identify trees/plants considered significant for historic or horticultural reasons, or deemed to be 'significant' under the *Development Act 1993* and/or the *Heritage Places Act 1993*. Lop or remove exotics where necessary for biodiversity and/or risk management.
Introduced Animals
• Undertake surveys to determine the extent of introduced animal populations and their relative impact on native flora and fauna. • Monitor introduced animal populations within the park and devise pest control programs in accordance with priorities, taking into account the benefits versus the costs of possible adverse impacts to native wildlife and other off-target impacts of such programs. • Work in cooperation with adjoining landowners, AMLRNRM Board, the Cities of Mitcham and Onkaparinga, the Friends of Sturt Gorge Recreation Park and the local community to achieve effective pest animal control.

MANAGING FIRE
• Implement and review the *Draft Reserves of the Southern Foothills, Mount Lofty Ranges Fire Management Plan (2007)* in association with CFS and other stakeholders. • Continue to work with the relevant District Bushfire Prevention Committee and CFS to minimise risk to life and property within and surrounding the reserve. • Continue to undertake annual fire prevention works and use planned fires, where appropriate, to reduce fuel hazards with the aim of protecting life and property. • Use applied fire as a biodiversity management tool if research indicates that it is appropriate, and burning can be undertaken safely. • Ensure visitors comply with any fire restrictions by providing information and monitoring visitor use. • Prohibit the use of solid fuel fires all year round, other than in leased areas where wood fires may be permitted subject to the approval of the park manager.
MANAGING CULTURAL HERITAGE
Aboriginal Heritage
• Recognise the continuing association of the Kaurna people with the Sturt River and its environs. • Consult with the relevant regional Aboriginal heritage committees and relevant Government Aboriginal heritage authorities in decisions regarding the management of Aboriginal heritage. • Identify and protect any Aboriginal sites, objects and remains in cooperation with the traditional owners, AARD and relevant authorities. • In consultation with the traditional owners, submit cultural sites and stories that relate to the park for inclusion on the AARD Central Archive.
Non-Aboriginal Heritage
• Identify, research and assess sites and items of archaeological, cultural, historical and biological/horticultural significance located in the park, in consultation with the knowledgeable persons, the Cities of Mitcham and Onkaparinga, the Heritage Branch of DEH and other relevant bodies. • Stabilise, protect and manage public risk associated with designated sites or objects of cultural significance, using appropriate measures, and monitor site condition on an ongoing basis. • Support the survey and inventory of historic sites and stories that relate to the history of the park area, and undertake a non-indigenous cultural heritage survey on the Craigburn Farm land added to the park. • Where appropriate, make this information available to visitors by preparing, displaying, maintaining and upgrading interpretive information including cultural heritage themes, to increase public awareness.

MANAGING TOURISM AND RECREATION
Visitor Access
• Prepare and implement a Visitor Facilities and Services Plan. • Implement traffic management studies prior to the development of any car parking and facilities areas. • Establish a Trails Master Plan to provide clearly defined routes for various recreational pursuits while eliminating duplication and reducing impacts on park values. • Establish and maintain liaison with the Cities of Mitcham and Onkaparinga, horse riding, bicycle riding and other specialist user groups, universities, schools, Scouts and event organisers. • Allow bicycle riding, horse riding and walking only on designated trails; monitor use and impose effective control measures to restrict access in erosion sensitive areas. • Develop a project (possibly with a tertiary institution) to survey and monitor visitor numbers and satisfaction levels. • Allow for the facilitation of the Sturt River Linear trail network through the park. • Continue to liaise with SA Water to explore options regarding the potential for managed public access across the dam wall.
Visitor Activities
• Support and encourage appropriate recreation events in the park. • In consultation with Bicycle SA, promote the Code of Conduct for bicycle riders. • In consultation with Horse SA and local riders, develop and implement a horse riding code of conduct if necessary. Any horse riding permitted in the park will occur on designated trails to avoid sensitive areas and minimise environmental impact. • Ensure that all visitors with geological interests refrain from collecting samples of and damaging the Sturt Tillite.
Information and Interpretation
• Provide signposting to educate users of park zoning and regulations. • Integrate interpretive information with trail development. • Consider a self-guided interpretive trail that focuses on geology. • Provide and regularly update information signs and interpretive material to encourage visitors to use existing walking, cycling and horse riding trails and to avoid erosion-prone areas. • Install and maintain signs and other information sources for visitors to ensure that they are well-aware of the values of the park and appropriate behaviour.

MANAGING RESERVE TENURE
• Undertake the proposed land exchanges that have been agreed to in principle between DEH, Planning SA, SA Water and the Cities of Mitcham and Onkaparinga, by adhering to the necessary conditions and legislative requirements. • Manage added land in accordance with zoning and other principles outlined in this management plan.
Leases and Licences
• Set lease conditions and monitor compliance as required, ensuring lease operations are consistent with protecting park values. • Review the need for grazing management on the Craigburn Farm land added to the park.
Public Utilities
• Maintain accurate records of utility services, particularly underground facilities, to minimise the potential for damage through park maintenance and future development works. • Maintain liaison with other agencies and utility companies and periodically review access requirements and maintenance programs.
INVOLVING THE COMMUNITY
• Continue to work with the Cities of Mitcham and Onkaparinga and the AMLRNRM Board, and explore further the benefits of partnership arrangements to deal with areas and 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 representative Kaurna Aboriginal traditional owners in the management of the park and the preservation of their cultural heritage. • Encourage the Friends of Sturt Gorge Recreation Park and other volunteer groups to feel a greater sense of partnership in the management of the park by consulting with them to review the direction of work activities based on the initiatives outlined in this plan of management, and integrate annual work programs of the Friends Group into the proposed management programs for the park. • Encourage and facilitate the involvement of local schools and universities in research and volunteer programs.

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