

Department for Environment and Heritage

Management Plan



Shepherds Hill Recreation Park

2008



Government
of South Australia

This plan of management was adopted on **30 May 2008** and was prepared pursuant to section 38 of the *National Parks and Wildlife Act 1972*.



Government of South Australia

Department for Environment
and Heritage

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FOREWORD

Shepherds Hill Recreation Park conserves 77 hectares of open space in the metropolitan area. The picturesque setting less than ten kilometres from Adelaide includes Grey Box Woodland and creeks lined with River Red Gums, and stunning views are available from the upper slopes of the park. The park provides habitat for native wildlife including parrots, possums, bats, koalas, reptiles and insects. The park also provides for a range of recreational opportunities in a natural setting, including bushwalking, off-road cycling and horse riding.

The plan defines a series of objectives and strategies for the future management and use of this significant reserve and facilitates the development and implementation of quality conservation programs and visitor management 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 Shepherds Hill 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.



HON GAIL GAGO MLC
MINISTER FOR ENVIRONMENT AND CONSERVATION



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This management plan was prepared with the assistance of and input from a stakeholder reference group comprising representatives from various government, non-government and community organisations. The hard work and commitment of those who contributed to this document is gratefully acknowledged.

1 PARK LOCATION AND FEATURES

Shepherds Hill Recreation Park is located in the foothills of the Mount Lofty Ranges, nine kilometres south of Adelaide in the City of Mitcham (Figure 1). Originally known as St Marys Reserve, the land was acquired as public open-space for recreation purposes in 1953 and managed by the South Australian Government Tourist Bureau as a dedicated National Pleasure Resort from 1955 until 1972, when it was constituted by statute as Shepherds Hill Recreation Park under the *National Parks and Wildlife Act 1972*. The park includes Allotment 4 of Deposited Plan 26144, Allotment 3 of Filed Plan 151775 and Allotment 45 of Filed Plan 150600. The park does not allow for mining access.

The 77 hectare park is in the south-west extremity of a much larger area of remnant native vegetation stretching across the foothills to Brownhill Creek. Much of that remnant vegetation is on reserved land and Shepherds Hill Recreation Park is part of a complex of public open-space land that protects native vegetation and provides a range of opportunities for outdoor recreation. In particular, it adjoins the Watiparinga Reserve (National Trust of South Australia) and the Saddle Hill and Ellis Avenue Reserves (City of Mitcham) (Figure 2).

Shepherds Hill Recreation Park forms part of Yurrebilla - The Greater Mount Lofty Parklands. Reaching from Cox Scrub Conservation Park and Kuitpo Forest in the south to Kaiserstuhl Conservation Park in the north, Yurrebilla incorporates a mix of publicly owned land and voluntarily nominated privately-owned areas. Yurrebilla aims to develop both a management program and culture of integrated land management that benefits biodiversity conservation and water quality, landscape protection, and the provision of recreational and cultural opportunities.

The land now conserved by Shepherds Hill Recreation Park was traditionally associated with the Kurna People (Tindale, 1974). Camp sites were often located on the banks of streams or near springs and permanent waterholes. While not a great deal of specific information is known about the use of the park area by the Kurna people prior to European settlement, several trees located near Ayliffes Road are understood to exhibit footholds, carved to assist in climbing.

Shepherds Hill provides recreation opportunities that make it a popular venue for both nearby urban residents and visitors from further afield. In particular, it is a park where horse and bicycle riding are permitted activities and it is used for recreation-related events.

The park conserves old-growth Grey Box (*Eucalyptus microcarpa*) Woodland and the creeks are lined with old-growth River Red Gum (*Eucalyptus camaldulensis*) Woodland. The park includes the confluence of Walkers and Wattiparringga Creeks and associated riparian environments, but the vegetation along the watercourses includes many weeds. Despite the European Olive (and numerous other weed species) occurring throughout the park, there are patches where remnant native understorey remains. Native grasses can be found and a number of rare plants occur in the park or nearby. The positive benefits from weed control and revegetation programs, mainly undertaken over the past decade, can be seen. Despite the extensive weed problem, the park provides habitat for some native wildlife including parrots, possums, bats, (introduced) koalas, reptiles and insects.

Shepherds Hill Recreation Park experiences seasonal variations in rainfall and temperature: cool, wet winters alternate with hot, dry summers. The majority of rainfall occurs between May and September and average annual rainfall in the park vicinity is estimated to be between 750-800 millimetres. The most frequent winds in the region are those from the south-west to north-west quarter bringing most of the winter rain. Gully winds are generally experienced at night during the warmest months of the year.

Weed control and revegetation has been undertaken near the Ayliffes Road boundary and car park (noting that some non-indigenous species were planted). Correctional Services teams have removed olives in the eastern portion of the park and around the entrance precinct. However, clearance of olives with heavy machinery in the central portion of the park was not followed up and despite some successful planting of mainly tree species, olives have regrown.

The Friends of Shepherds Hill Recreation Park group was convened in 1999 and members have been active since then. The group have successfully weeded the eastern boundary portion of the park, adjacent Watiparinga Reserve, where the native vegetation is most intact, and have carried out revegetation on cleared slopes using locally collected seeds.

This management plan replaces the previous 1992 management plan.

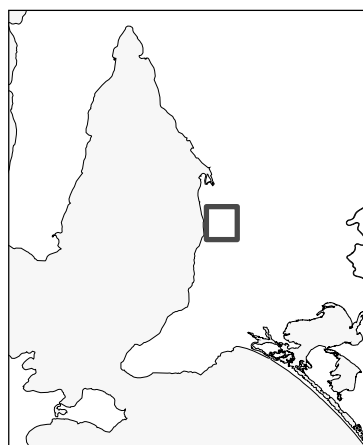


Figure 1

Shepherds Hill Recreation Park

Location

Legend

- National Parks and Wildlife Act Reserves
- Vegetation Heritage Agreements
- Roads
- Railways
- (RP) Recreation Park
- (CP) Conservation Park
- (NP) National Park

Produced by Land Management Branch
Department for Environment and Heritage

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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 Shepherds Hill Recreation Park was released for public exhibition in November 2006. At the close of the comment period, 30 submissions were received. The majority of these submissions provided comments that were for and against the use of bicycles in the park. All comments and concerns were considered by the Adelaide Region Consultative Committee and forwarded to 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 released and adopted 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

The vision for Shepherds Hill Recreation Park is for a park that allows visitors to pursue recreation activities in a natural setting within the Adelaide metropolitan area and contributes to the conservation of biological diversity.

3.1 Key Values

- Conserving old-growth Grey Box Woodland and old-growth River Red Gums.
- Providing recreation opportunities in a natural setting.

3.2 Key Pressures

- High possibility of erosion occurring through unauthorised track construction.
- Introduced weed species threatening biodiversity values of the park.

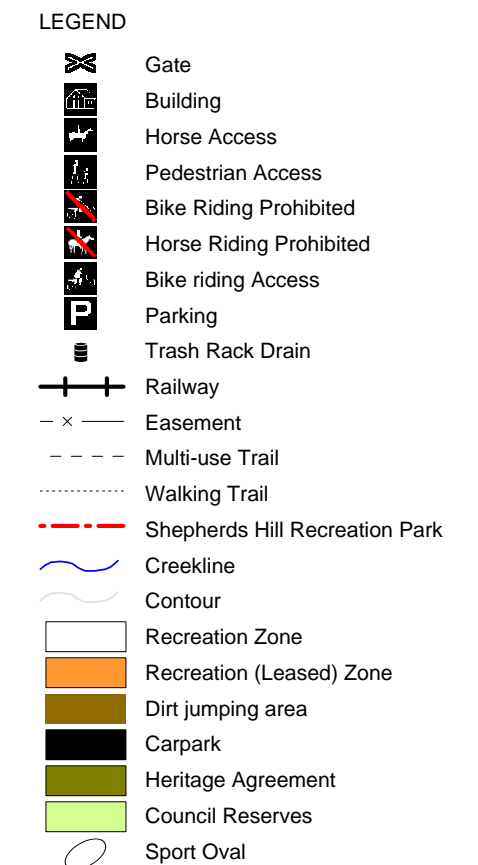
3.3 Key Management Strategies

To protect the key values and address the key pressures, the following strategies from within the management plan are priorities to be addressed during the term of this management plan.

- **Visitor Activities:** Work with all users to develop a Trails Master Plan that rationalises inappropriate trails and includes a sustainable network of multi-use and specific trails throughout the park.
- **Native Vegetation:** Prepare and implement a vegetation management plan for the park and assess natural regeneration, identify rehabilitation priorities and integrate weed control programs according to the recommendations in that plan.



Figure 2
Shepherds Hill Recreation Park
Features and Zoning



Map created by Reserve Planning using PAMS
 Projection: MGA Zone 54, GDA 94
 Date: November 2007

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.

In the case of Shepherds Hill Recreation Park, it is not considered necessary to establish a complex zoning framework to ensure sustainable use of the park during the life of this plan. It is adequate to have two zones, one for the majority of the park and one to address the special arrangements applying to two areas where recreational leases have been granted. If future park management determines that extra zones are necessary for the better protection of natural values, this plan may be amended to allow for their establishment.

Recreation Zone

The Recreation Zone encompasses the majority of the park. Biodiversity conservation initiatives will be a significant management focus within the zone. The zone is intended to permit a range of recreation activities and to enable the provision of facilities and services for visitors, together with some limited infrastructure for park management. Every effort will be made to rehabilitate degraded sites, minimise disturbance and ensure sustainable use.

Preferred sites for any development of facilities, including track and trail construction, are those areas with established infrastructure, areas where past disturbance has already caused significant impact and further development will improve, not exacerbate the problem, or areas where impacts can be minimised and long-term sustainability assured.

Dogs are permitted throughout the Recreation Zone if restrained on a lead and directly under the control of a responsible person. Horses and bicycles are also permitted in the zone on designated tracks/trails. Motor vehicle use will be restricted to park managers, lessees and special permittees.

Recreation (Leased) Zone

This zone relates to the areas leased by DEH to the Marion Pony Club and the Eden Field Archers (Figure 2). DEH recognises the prior-existence of these long-term leases and will support their continued operation (subject to the outcome of any pending or future negotiations). The lessees have exclusive use and sole responsibility for the management of those areas (and sole responsibility for the provision of utility services to same).

The lessees will be required to manage their areas in compliance with this management plan. The protection of the natural environment in a National Parks and Wildlife Act reserve is an important consideration and any upgrading of leased facilities will need to accord with the Hills Face Zone Principles. If the situation arises where a lease is terminated or not renewed, then that area will default to Recreation Zone designation.

Objective

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

Strategy

- Designate and adopt the management zones as shown in Figure 2 and apply the prescriptions as outlined in this plan.

5 MANAGING NATURAL HERITAGE

5.1 Geology, Soils and Landform

Most of the sedimentary rocks of the Adelaide foothills belong to the Burra Group. These sandstones, siltstones, shales and dolomites were deposited in shallow Precambrian seas between 800 and 750 million years ago.

The earliest and most spectacular sediment of glacial origin in the Adelaide region is the Sturt Tillite. Sturt Tillite and overlying interglacial laminated siltstones of the Tapley Hill Formation belong to the Umberatana Group, which together with the overlying Wilpena Group, is more extensively exposed in the Flinders Ranges to the north. The local geology of the Shepherds Hill Recreation Park has not been well documented. Sturt Tillite, known to occur in Sturt Gorge Recreation Park and in the grounds of Flinders University, has also been recorded in the park. This is of significance, particularly as it has been observed that the tillite outcrops represent sites of plant biodiversity.

Soils within the park strongly reflect underlying geology and erosion processes. This in turn has implications in terms of track and trail sustainability. Recreational activities, if they are not managed effectively (eg horse riding and BMX and mountain bike riding, particularly if this involves the unauthorised construction of new trails), can cause localised but potentially severe soil erosion and soil compaction. There is strong evidence in the park of excessive use of poorly designed trails causing extensive erosion. The feasibility of creating new, sustainable mountain bike trails should be investigated, to remove pressure from unsustainable, heavily eroded trails (Section 8 Managing Tourism and Recreation).

Visitors should be informed of any existing or erosion-prone areas and requested to avoid unnecessary intrusion by using the designated tracks provided. Location and siting of tracks and trails should be done in such a way that the potential for erosion is minimised. Remedial works should be undertaken and appropriate barriers installed to reduce erosion in sensitive and high impact areas.

Objective

Conserve soils within the park and protect tillite outcrops from adverse impacts.

Strategies

- Assess soil type and properties, including erosion potential, when planning for future management or visitor access or when undertaking management and development works.
- Identify existing areas of erosion and undertake remedial works that may include access exclusion, natural regeneration, revegetation and pest plant removal.

5.2 Hydrology

Wattiparringga Creek flows through a gully to the north of the dominant steep-sided hill and westwards through the park, joining the smaller, north-flowing Walkers Creek in the north-west corner of the park, before running beneath Ayliffes Road (Figure 2). The catchments for these creeks are located in the suburbs of Eden Hills and Belair.

The riparian environment associated with these creeks is seen as a significant park value, particularly the Woodland dominated by large, mature River Red Gums. The shaded areas along the creeks provide for pleasant walking, and the steep-sided creek bank near the Ayliffes Road entrance (often referred to as Dingley Dell) has proved ideal for BMX and mountain bike 'dirt jumping'. The impact of this heavy use has been the creation of bare ground, erosion and compaction of soil.

Shepherds Hill Recreation Park receives urban run-off from surrounding properties, and input via the creek systems. On-park activities should not degrade water quality, increase run-off or create down-stream impacts. Uncontrolled public use and loss of aquatic and riparian vegetation can exacerbate these changes. The potential for erosion and the resultant silting of creeks is therefore seen as a park management issue.

Adelaide's Mediterranean climate and its topography of slopes and plains, plus the 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 duration of rainfall, due to the combined effects of run-off from the surrounding urban area and a substantial contribution from the up-stream catchment, which

becomes saturated in these long-duration storms. To alleviate the flood danger to down-stream properties, a 'trash rack' and drainage works have been constructed in the park on Wattiparringga Creek adjacent Ayliffes Road. Such structures require on-going maintenance.

The Adelaide and Mount Lofty Ranges Natural Resources Management (AMLRNRM) Board, which is responsible for improving water quality through improved catchment management practices, can assist park management by ensuring that all activities along the creeks of the catchment are compatible with the preservation of natural flows and the conservation of biodiversity. By this means, all aspects of the natural resources of the catchment can be effectively managed for the benefit of the public and the natural environment.

DEH should cooperate with the AMLRNRM Board and the City of Mitcham to restore creek banks and to facilitate flood mitigation measures, which may contribute to the reduction of flood damage in the Shepherds Hill catchment.

Objective

Restore and maintain natural hydrology as far as possible.

Strategies

- Manage on-park (and engage with neighbours regarding off-park) activities to minimise adverse impacts on the hydrology and creek systems.
- Participate in regional catchment management programs, in partnership with the AMLRNRM Board and the City of Mitcham, in support of flood mitigation and water quality schemes and to minimise any negative impacts to the Shepherds Hill catchment.
- Collaborate with the AMLRNRM Board to identify and repair existing areas of erosion through coordinated revegetation and pest plant eradication programs.
- Continue to encourage and support the involvement of the Friends of Shepherds Hill Recreation Park and other volunteers in revegetation programs that improve aquatic and riparian vegetation and the monitoring of water quality.
- Continue to support the environmental restoration of the park and manage the terrestrial areas of the park in a manner that positively contributes to water quality in the creeks of Shepherds Hill Recreation Park.

5.3 Native Vegetation

The native vegetation communities present in the park today have been greatly modified by a history of farming, grazing and invasion by introduced species.

The vegetation of the park comprises, in part, a remnant open woodland of Grey Box (*Eucalyptus microcarpa*) with the native understorey species Kangaroo Thorn (*Acacia paradoxa*), Golden Wattle (*Acacia pycnantha*), Native Hopbush (*Dodonaea viscosa* spp. *spatulata*), and Wallaby Grass (*Danthonia caespitosa*).

The understorey has been invaded by a range of introduced species, notably European Olive (*Olea europaea*), Large Quaking-grass (*Briza maxima*), Boneseed (*Chrysanthemoides monilifera*), Cotton Bush (*Gomphocarpus cancellatus*), Montpellier Broom (*Genista monspessulana*), and various alien grasses.

In isolated pockets where a more intact native understorey remains, typical species associated with Grey Box might include Drooping Sheoak (*Allocasuarina verticillata*), Sweet Bursaria (*Bursaria spinosa*), Dense Flowered Mat-rush (*Lomandra densiflora*), Kangaroo Grass (*Themeda triandra*), and Spear Grass (*Austrostipa* spp.).

Grey Box is considered to be uncommon in the Southern Mount Lofty Ranges and Grey Box Woodlands are limited in their distribution to the foothills and hill slopes south of Adelaide (roughly the area between the Princes Highway and McLaren Vale). Referred to in colonial times as the 'Black Forest' they have borne the brunt of suburban settlement and invasion by exotics. There are only a few degraded examples in other DEH reserves (eg Belair National Park, Sturt Gorge Recreation Park and Onkaparinga River National Park).

The presence of this vegetation association in Shepherds Hill Recreation Park (and in the adjacent reserves managed by other agencies) is significant in terms of park biodiversity values, and future protection is important. Moreover, some of the Grey Box trees are unusual in that they are 'old growth' and of particularly large size, making them valuable wildlife habitat.

Along the watercourses within the park, another major vegetation association occurs - River Red Gum (*Eucalyptus camaldulensis*) Open Woodland with an understorey that comprises mainly introduced herbs, shrubs and woody weed species, but also includes Native Hollyhock (*Malva behriana*), sedges (eg *Cyperus vaginatus*) and rushes (eg *Juncus pallidus*). The sides and upper flanks of these valleys can carry an open woodland of South Australian Blue Gum (*E. leucoxydon*). Golden Wattle, Large Quaking-grass, Native Cranberry (*Astroloma humifisum*), Kangaroo Grass, Olearia Daisy-bush (*Olearia ramulosa*), and African Daisy (*Senecio pterophorus*) predominate in the understorey.

Shepherds Hill Recreation Park, together with Watiparinga Reserve, has the last substantial remnant of River Red Gum Woodland in the southern Hills Face Zone and represents a significant park biodiversity value. The large trees provide nesting hollows for wildlife and the wattles, sedges and rushes that line the creeks provide feeding habitat for birds.

DEH recognises the need to conserve trees and vegetation that have significance for either natural or cultural reasons. Large species may be protected as 'significant trees' if they meet the criteria of the *Development Act 1993* (trunk circumference of two metres or greater). '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.

The remainder of Shepherds Hill Recreation Park has been extensively altered. The higher, southern portions of the park are virtually devoid of trees and are covered by an Olive-dominated grassland of alien species. Replanted Drooping Sheoaks stand out, along with a few native shrubs, including Kangaroo Thorn and Golden Wattle. Amidst the exotics, the Western New Holland Daisy (*Vittadinia blackii*), Brush Wire-grass (*Aristida behriana*), Kangaroo Grass, Wallaby Grass and species of Spear Grass can be found. It is likely however, that a more thorough survey of the park's vegetation would reveal other native species of interest.

Much of the understorey of Shepherds Hill Recreation Park is degraded and the park is thus of limited use as fauna habitat. However, there are a number of threatened species (at the state and regional level) listed for the park (Table 1). It is noteworthy too, that the Small Scurf Pea (*Cullen parvum*) and the Blue Devil (*Eryngium rostratum*) occur on the adjoining Saddle Hill Reserve (City of Mitcham).

Having two under-reserved plant communities in the park (particularly as the park's vegetation is contiguous with similar vegetation on adjacent protected areas) makes it significant in the Hills Face Zone and Southern Mount Lofty Ranges. This band of native vegetation serves as a corridor for the more mobile wildlife species, such as bats, birds and koalas.

The main threats to native flora are perceived to be the high level of introduced species and the probability that inappropriate recreation activity could negatively impact rare plants.

The management of native vegetation within the park will be guided by a vegetation management plan, which will provide a strategic approach to conservation management and recommend strategies to control introduced plants and detrimental activities, focussing on the communities of conservation significance and outlining 'best practice' strategies to ensure their survival. This should be preceded by a comprehensive vegetation survey.

Weed control undertaken by the Friends of Shepherds Hill Recreation Park has thus far involved concentrating on the largest intact area of native vegetation, in the eastern part of the park adjacent to Watiparinga Reserve. It would be desirable to build on that success in other areas of the park with existing good quality native vegetation. It is important to establish future weed control and native vegetation management programs according to an approved management plan.

DEH also has an interest in partnering landowners adjacent to the park and upstream of 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. In this context, the community groups associated with the Patawalonga Catchment Water Management Zone have been involved in restoring riparian habitats by removing woody weeds and replacing them with more appropriate native species. There may be merit in extending this work into the park.

Table 1: Plant Species of Conservation Significance Recorded in Shepherds Hill Recreation Park

Scientific Name	Common Name	Conservation Status	
		State	Regional
<i>Aristida behriana</i>	Brush Wire-grass		U
<i>Austrostipa elegantissima</i>	Elegant Spear-grass		U
<i>Bothriochloa macra</i>	Red-leg Grass	R	R
<i>Dianella longifolia</i> var. <i>grandis</i>	Pale Flax-lily	R	V
<i>Eucalyptus microcarpa</i>	Grey Box		U
<i>Glycine tabacina</i>	Variable Glycine	V	E
<i>Goodenia albiflora</i>	White Goodenia		U
<i>Goodenia pinnatifida</i>	Scrambled Eggs		U
<i>Malva behriana</i>	Australian Hollyhock		U
<i>Lotus australis</i>	Australian Trefoil		U
<i>Maireana enchylaenoides</i>	Wingless Fissure-plant		U
<i>Pittosporum angustifolium</i>	Native Apricot		R
<i>Pleurosorus rutifolius</i>	Blanket Fern		U
<i>Ptilotus erubescens</i>	Hairy Heads	R	R
<i>Setaria jubiflorum</i>	Warrego Summer Grass		K
<i>Velleia paradoxa</i>	Spur Velleia		U
<i>Vittadinia blackii</i>	Western New Holland Daisy		R
Total		4	17

Note: See Appendix for Conservation Status Codes

Phytophthora

Cinnamon Fungus (*Phytophthora cinnamomi*) is an introduced soil-borne pathogen that kills a wide range of native plant species by attacking their root system, and reducing or stopping the movement of water and nutrients within the plant. The potential spread of *Phytophthora* by approved recreational activities (eg bushwalking) is known. As such, a precautionary approach may result in further access restrictions during the wetter months of the year.

A pro-active approach should be taken when planning access routes and the designation (for recreational uses), repair and relocation of tracks and trails. The installation of devices at park entrances (eg boot cleaning stations) to minimise the spread of *Phytophthora*, as has been done elsewhere in the Adelaide Hills, may be a worthwhile measure to both raise awareness of the risk and to promote responsible actions if the disease is subsequently confirmed.

At present *Phytophthora cinnamomi* has not been found in this park. Nevertheless, park managers still need to take all necessary precautions when planning earth-moving operations. Only soil or track-building materials that are known to be free from pathogens, fungi or indeed any other plant matter (including weed seeds) should be imported into, or moved around, the park. The strategies outlined in the DEH *Standard Operating Procedure for Phytophthora Threat Management* should be implemented. The high level of recreational use (horses, bicycles and walkers) is also a factor, given the potential for spread of this disease. Therefore siting, designation and repair and re-location of tracks and trails should be undertaken with this potential issue in mind.

Objectives

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

Reduce the possibility of the introduction or spread of soil-borne diseases and pathogens, especially *Phytophthora cinnamomi*.

Strategies

- Prepare and implement a vegetation management plan for the park and assess natural regeneration, identify rehabilitation priorities and integrate weed control programs according to the recommendations embodied in that plan.
- Monitor plant populations and implement individual species management programs if necessary, particularly for the Grey Box and River Red Gum.
- Develop and maintain partnership arrangements with the managers of neighbouring properties to ensure that as far as is feasible, efforts at vegetation management are integrated on a regional basis.
- Support and encourage the Friends of Shepherds Hill Recreation Park and other volunteers, to continue revegetation programs and to assist with monitoring species of conservation significance in collaboration with DEH.
- Take account of possible *Phytophthora cinnamomi* introduction/spread when planning access routes or management and development works that involve movement of soil or machinery.
- Continue to promote awareness amongst DEH staff and the wider community of the potential for introduction and establishment of *Phytophthora cinnamomi*, the plant species susceptible to it and indicators of its presence.

5.4 Native Fauna

Settlement in the foothills resulted in a decline in the number and abundance of native fauna species and only a fraction of the pre-colonisation vertebrate biodiversity remains. Severe habitat modification through land clearing and the introduction of exotic animal species (both as predators and as competitors for food and habitat) have been major factors contributing to a decline in mammal populations, with a number of the species present at the time of settlement now extinct.

Although Shepherds Hill Recreation Park is bordered by residential properties and subject to disturbance from human activity, it continues to function as a refuge and feeding area for some wildlife. While only providing relatively degraded habitat, the park is located within a larger zone of native vegetation and is a useful habitat corridor.

Reptiles and Amphibians

Seven species of frog are widely dispersed throughout the Adelaide region. Particularly common in the Mount Lofty Ranges is the Brown Toadlet (*Pseudophryne bibroni*). Most species occur in the vicinity of permanent or temporary water or in other well-watered areas. Although there are no records of amphibians for the park, the riparian zone may prove to be a significant habitat. Anecdotal evidence suggests that there are tadpoles in Wattiparringa Creek on an annual basis.

Reptiles are also well represented in the foothills and 15 species have been recorded from the park. Numerous small skinks, legless lizards and geckos occupy sheltered crevices around rocks and within vegetation. Cunningham's Skink (*Egernia cunninghami*) rated as endangered at the state level, is the most significant threatened species. Common venomous reptiles recorded from the park include the Eastern Brown Snake (*Pseudonaja textilis*) and the Red-bellied Black Snake (*Pseudechis prophyriacus*) which occurs frequently along creeks and watercourses.

Mammals

It is unlikely that the heavily cleared and modified environment of the park provides habitat for many native mammal species, since these species usually rely on areas of intact native vegetation for their survival. The state rare Common Brushtail Possum (*Trichosurus vulpecula*) however, is well adapted to an urban environment and occurs commonly throughout the foothills and is likely to inhabit the large, hollow trees. The Common Ringtail (*Pseudocheirus peregrinus*) although more abundant in dense natural scrub, can also occur in native vegetation close to urban settlement and may also be present.

It is possible too, that other species, such as the Yellow-footed Marsupial Mouse (*Antechinus flavipes*), the Echidna (*Tachyglossus aculeatus*), the Bush Rat (*Rattus fuscipes*), and the Water Rat (*Hydromys chrysogaster*) may occur where patches of suitable habitat remain. The status of bats within the park is inconclusive, but species found at Belair National Park are likely to occur at Shepherds Hill Recreation Park.

The Koala (*Phascolarctos cinereus*), although not indigenous to the Mount Lofty Ranges, may occasionally be found feeding in either Grey Box (*Eucalyptus microcarpa*) or River Red Gum (*Eucalyptus camaldulensis*) trees.

Birds

There are 38 native bird species recorded for the park including the Tawny Frogmouth (*Podargus strigoides*), Nankeen Kestrel (*Falco cenchroides*), Red Wattlebird (*Anthochaera carunculata*), Laughing Kookaburra (*Dacelo novaeguineae*), Superb Fairy-wren (*Malurus cyaneus*), New Holland Honeyeater (*Phylidonyris novaehollandiae*), Crimson Rosella (*Platycercus elegans*), Eastern Rosella (*Platycercus eximius*), and Brown Falcon (*Falco berigora*). The Crested Shrike-tit (*Falcunculus frontatus*) rated as rare at the state level, is the only threatened bird species recorded to date. The management plan for the adjacent Watiparinga Reserve identifies 57 native species recorded in that reserve.

Invertebrates

Although not officially recorded, many invertebrate species occur in Shepherds Hill Recreation Park. These species occupy integral roles in ecosystem function, and should be taken into consideration when undertaking management activities.

Objective

Identify and protect native fauna species, especially those of conservation significance.

Strategies

- Encourage approved volunteer groups and individuals to conduct fauna surveys and undertake population monitoring. Investigate opportunistic sightings to verify species identification.
- Identify and protect significant fauna habitats and integrate habitat restoration with native revegetation efforts and weed management programs.

5.5 Introduced Plants

Weeds are regarded as one of the major threats to indigenous plant communities and weed invasion is seen as both a symptom and a cause of degradation of native plant communities in the park. Both the upland and riparian zones of the park are highly modified and there are many introduced plant species, nine of which are proclaimed and require control under the *Natural Resources Management Act 2004* (Table 2).

Table 2: Introduced Plant Species Recorded in Shepherds Hill Recreation Park

Species	Common Name
* <i>Allium triquetrum</i>	Three-cornered Garlic
* <i>Asphodelus fistulosus</i>	Onion Weed
* <i>Carduus tenuiflorus</i>	Slender Thistle
<i>Carthamus lanatus</i>	Saffron Thistle
* <i>Chrysanthemoides monilifera</i>	Boneseed
<i>Cynara cardunculus</i>	Artichoke Thistle
* <i>Echium plantagineum</i>	Salvation Jane
* <i>Euphorbia terracina</i>	False Caper
<i>Genista monspessulana</i>	Montpellier broom
<i>Lavandula stoechas</i>	Topped Lavender
* <i>Lycium ferocissimum</i>	African Boxthorn
* <i>Marrubium vulgare</i>	Horehound
<i>Oxalis brasiliensis</i>	
* <i>Oxalis pes-caprae</i>	Soursob
<i>Olea europaea</i> ssp. <i>europaea</i>	European Olive
* <i>Opuntia</i> ssp.	Prickly Pear
* <i>Rubus</i> ssp.	Blackberry
* <i>Senecio pterophorus</i> var. <i>pterophorus</i>	African Daisy
* <i>Silybum marianum</i>	Variegated Thistle

* Proclaimed under the *Natural Resources Management Act 2004*

The management of non-indigenous vegetation within the park will be guided by the vegetation management plan (section 5.3 Native Vegetation), which will provide a strategic approach to conservation management and provide strategies to control introduced plants. It is most important that weed control activities do not inadvertently impact on the native communities and species they are intended to benefit. The regeneration program undertaken in Watiparinga Reserve is an exemplar in this regard (Robertson, 1999).

Weed control undertaken by the Friends of Shepherds Hill Recreation Park has thus far involved concentrating on the largest intact area of native vegetation, in the eastern part of the park adjacent to Watiparinga Reserve.

To effectively control the spread and threat of weeds, a regional integrated weed control program needs to be developed, involving the surrounding property owners/managers, City of Mitcham and the AMLRNRM Board. Weed control programs should be coordinated according to priorities outlined in the vegetation management plan and the legal requirements of the *Natural Resources Management Act 2004*.

DEH is responsible for the conservation of trees that are significant for either their natural or cultural value, whether they are indigenous or introduced. However, where a tree is causing damage to property or is considered a safety hazard, appropriate steps have to be taken to ensure safety requirements are maintained.

Objective

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

Strategy

- Encourage the development of and contribute to integrated regional weed control programs that will establish pest plant control priorities and strategies, and combine weed control with native plant revegetation efforts on neighbouring land.

5.6 Introduced Animals

A number of introduced mammal species occur in the wild throughout the foothills and would in all probability inhabit the park. The European Rabbit (*Oryctolagus cuniculus*), Brown Hare (*Lepus capensis*), House Mouse (*Mus musculus*), Black Rat (*Rattus rattus*), Feral Cat (*Felis catus*), and Red Fox (*Vulpes vulpes*) are all likely to be found there.

Six introduced birds are also regularly found in the park. These are the Eurasian Skylark (*Alauda arvensis*), European Goldfinch (*Carduelis carduelis*), House Sparrow (*Passer domesticus*), Spotted Turtle Dove (*Streptopelia chinensis*), Common Starling (*Sturnus vulgaris*), and Common Blackbird (*Turdus merula*). Attempts to reduce populations of these ubiquitous birds are unlikely to be effective and are not proposed at this time.

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

The park's proximity to residential properties restricts comprehensive introduced animal control programs being undertaken, due to the risk of domestic animals inadvertently consuming poison baits intended for introduced species. There may be opportunities in the future to develop acceptable control programs in cooperation with neighbours. Given this proximity, and the degraded nature of the park, the focus for introduced animal control will be on species that present obvious management issues.

Objective

Implement programs to control introduced animals where feasible when having a noticed impact upon park values and neighbouring land.

Strategies

- Monitor 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.
- If control programs prove necessary, work in cooperation with adjoining landowners, Adelaide and Mount Lofty Natural Resources Management Board, the City of Mitcham, the Friends of Shepherds Hill Recreation Park and the wider community to achieve effective pest animal control.

6 MANAGING FIRE

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. It is also well recognised that Aboriginal people used fire as a 'tool' although the actual extent (and impacts) of such use in Shepherds Hill are unknown to DEH.

Fire management mechanisms are always a necessary component of park management, especially considering that this park is located in the relatively well-vegetated foothills, and given its close proximity to neighbouring properties and residential areas. It is located at the western extremity of that part of the Mount Lofty Ranges deemed to be particularly prone to bushfires where development is subject to special planning policies.

Since 1980, there have been eight bushfires in the park. Most have been minor (the largest was seven hectares in extent) and all started near the park boundary. It is assumed that they were either deliberately lit, started accidentally by members of the public or by children playing, or were the result of cigarette butts discarded by passing motorists. These fires have all been controlled and confined to grassland.

The National Trust has worked extensively on the adjoining Watiparinga Reserve to control woody weeds. DEH staff conduct an annual bushfire prevention program to strategically manage fuel loads in Shepherds Hill Recreation Park.

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

DEH prepared the *Draft Reserves of the Southern Foothills, Mount Lofty Ranges Fire Management Plan* (2007) (including Shepherds Hill Recreation Park), in consultation with adjoining Country Fire Service (CFS) Groups and the District Bushfire Prevention Committee, 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. Gas barbecues may be allowed in the leased zones only, except on total fire ban days when all types of fire are prohibited. On days of extreme fire danger, the park may be closed to the public, although this has not been a common occurrence in recent years.

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 *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 Mitcham Bushfire Prevention Committee and CFS and comply with provisions of the *Emergency Management Act 2005* to minimise risk to life and property within and surrounding the park, including the suppression of fires as soon as possible.

7 MANAGING CULTURAL HERITAGE

7.1 Aboriginal Heritage

The land now conserved by Shepherds Hill Recreation Park was traditionally associated with the Kaurna People (Tindale, 1974). There is limited information available on Aboriginal inhabitation of the Adelaide region, which may suggest that the plains and foothills provided a more congenial location for occupation than the colder, heavily-wooded, central Mount Lofty Ranges, although the natural resources of the Ranges were used by the Kaurna people on a seasonal basis. Tindale (1974) was of the opinion that the Kaurna practiced transhumance (ie they moved seasonally between different environmental zones) migrating towards the sea for the summer and inland for the winter.

The park area was probably used as a camping, hunting and gathering ground. Camp sites were often located on the banks of streams or near springs and permanent waterholes, and evidence of Aboriginal inhabitation can still be found at old camp sites in such locations. While not a great deal of specific information is known about the use of the park area by the Kaurna people prior to European settlement, several trees located near Ayliffes Road are understood to exhibit footholds, carved to assist in climbing. There are anecdotal reports of scarring on another tree where bark material was removed to make a shield or container.

Perhaps the most significant impact of the Kaurna on the natural environment may have been their use of fire. Early accounts state that the Aboriginal peoples regularly lit small fires to encourage patches of new tender plant regrowth and thus attract game. Animals overcome by fire and smoke also provided an addition to their diets. The extent of these fires may have been considerable and their effect on the structure and composition of vegetation and fauna populations after thousands of years of periodic burns can only be surmised.

Today, Kaurna people live on their country and practice their culture and language. Some of the language and traditional stories have been recorded, however, to date the full extent of Aboriginal heritage at Shepherds Hill Recreation Park has not been comprehensively researched. Furthermore, 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 the 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 Shepherds Hill Recreation Park, a comprehensive survey of the park has not been undertaken and there may be unidentified Aboriginal sites, objects and remains in the park. 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 DAARE 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

- 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

Considerable tree-felling took place in Shepherds Hill Recreation Park from the time of early settlement, providing fencing and building materials and clearing the land for agriculture. Limited cropping probably occurred on the flatter areas of land. Frederick Mitchell, the original grantee of Section 14, was recorded as running a property called Glen Forbes on this Section. A contemporary description of Mitchell's farm suggests that he cropped wheat, barley and maize (South Australian Archives 13 84/46; "Papers Relative to the Affairs of South Australia 1840").

Most of the Shepherds Hill land has had a long history of grazing. Sheep grazing continued until the late 1950s, when domestic dogs became a menace. Horses were then agisted on the park until 1969, when grazing rights were finally withdrawn. Over time, various internal fences were erected to confine stock. The remains of several ditches which also once served as barriers can still be seen extending between Sections 35 and 36, and between Sections 36 and 13. More historical sites are identified and described in *Historic Site and Landscapes - Mitcham Hills, Hills Face Zone Cultural Heritage Project (Volume 2, 2005)*.

As noted in Section 5.5 Introduced Plants, some of the introduced vegetation in the park may date from the early settlement era and introduced trees/plants should not be removed without first ascertaining their historic significance. In that regard, the advice of Heritage Branch of DEH and the Mitcham Heritage Research Centre should be sought.

There are no State Heritage places listed within this park.

Objective

Ensure that any sites or items of heritage value are appropriately protected and interpreted.

Strategies

- Consult Heritage Branch of DEH and the Mitcham Heritage Research Centre before removing introduced trees.
- Cooperate with relevant authorities and organisations to protect any sites or items of non-Aboriginal heritage significance that are discovered in the future.

8 MANAGING TOURISM AND RECREATION

8.1 Visitor Access

There have been no recent, quantifiable surveys on how the public (or how many people) use this park. With the passage of time, the type of recreational use has probably changed to some extent. However, by virtue of routine patrols, on-site observations and interaction with community groups, park managers have kept abreast of the changing nature and patterns of recreational use. Mountain bike and BMX riding, along with walking and dog exercising, are probably the most common activities observed. Quantifiable visitor information needs to be obtained and visitor surveys may be suitable tasks for tertiary institutions.

Some problems have resulted from inappropriate visitor behaviour, with vandals causing considerable damage to certain fixtures. The Marion Pony Club clubrooms have been broken into and damaged on occasions, and the (former) toilet block was continually being defaced. The irregular but on-going use of the park by trail bike riders is of concern to management. The problem has been reduced somewhat through the installation of barriers to restrict entry, but many of these are often removed or smashed. It appears that some trail bike riders use the park as a thorough-fare between the adjacent and adjoining suburbs, while others explore the park itself.

It can be anticipated that recreational demands on this park will continue to evolve, in parallel with changing community interests. Effective management of the recreational use of this park is needed to ensure that a diversity of activities continues to be accommodated in the park; that conflict between different forms of park use is minimised; and that impacts on landscape and biodiversity values will be maintained at or below levels that do not reduce the biodiversity values of the park. Proliferation of tracks in the park generally is a major issue – despite the recommended action in the 1992 management plan, no track rationalisation has thus far taken place.

Walking Trails

The suburban train station provides access for walkers, and this mode of access should be encouraged. The park's main walking trails are found along Wattiparringga Creek (Figure 2). Although these trails are designated for walking only, many mountain bike riders also use them. Walkers also use the fire access tracks across the ridgeline and throughout the park.

Multi-Use Trails

Equestrian entrances installed at several locations around the park boundary have facilitated ready access for trail horse riders and mountain bike riders. These access points will be assessed for suitability to users. DEH will liaise with Mitcham City Council regarding trail linkages through Council reserves to Shepherds Hill Recreation Park. Horse riding is acceptable throughout the park on designated multi-use trails (Figure 2).

Mountain Biking Trails

Presently mountain bike riding is acceptable throughout the park on designated multi-use trails. As mentioned above, mountain bike riding occurs on many of the walking trails along Wattiparringga Creek. There is no evidence to suggest excessive erosion has been caused specifically by riding in this area. Nonetheless, there is a perceived issue arising from the use of these trails by mountain bike riders through endangerment to other trail users (ie walkers) due to the higher speeds that mountain bikes are capable of travelling.

A series of unauthorised downhill mountain bike tracks have been constructed between Ridge Track and Viaduct Track. These tracks are technically difficult, and unsuitable for walkers, horse riders or recreational mountain bike riders. Due to riders taking short-cuts across corners, these narrow tracks have become badly eroded in a short period of time.

While DEH recognises and appreciates mountain biking as a significant recreational pursuit, its primary focus is conservation. Therefore, park managers will endeavour to close and rehabilitate all unauthorised tracks that are seen as a risk to conservation (including soil erosion). In order to prevent these tracks from being reopened, DEH will investigate the possibility of creating new, sustainable tracks that provide some degree of the level of challenge sought by more experienced mountain bikers without creating significant environmental damage.

Vehicle Access

Motorised recreational and off-road vehicles are not permitted in the park since they interfere with other forms of park use, can cause environmental damage, and disturb local residents. The current restrictions on vehicle access are considered appropriate in a park of this size. Park managers and the lessees are permitted to bring vehicles into the park, as are special event permittees. Public vehicle access (for lessees and approved spectators) beyond the pony club and archery areas is not permitted.

Objective

Provide for a range of visitor access without compromising park values.

Strategies

- Permit horse riding and mountain biking on designated trails.
- Undertake Trails Master Planning and establish a track and trail rationalisation/maintenance program to provide clearly defined routes for visitors while eliminating duplication and reducing impacts on park values.
- Investigate popular recreation routes linking with other adjoining or nearby recreation areas and provide access points to avoid illegal entry and exiting of the park.
- Investigate feasibility of creation of sustainable mountain bike trails and maintain, improve and repair (or close or relocate) access tracks and walking trails to stabilise soil as required.
- Establish and maintain liaison with walking, horse riding, mountain bike riding and other specialist user groups and event organisers, and develop and implement appropriate codes of conduct.

8.2 Visitor Activities

A range of activities are enjoyed by the public in Shepherds Hill Recreation Park, most of which are compatible with the current park values. The park is well used by neighbourhood residents, particularly in the evenings, weekends and public holidays. The park is currently used for low-key unstructured active and passive recreation.

Whilst the protection and enhancement of the park's environmental values is a major priority, it is also important that the park continues to provide for a range of formal and informal recreation activities. Although the nature of these recreation activities means that they may, to varying degrees, impact on the environmental values of the park, careful management will maintain impacts at a sustainable level.

Walking

Walking and jogging occurs frequently in the park along most of the walking trails and fire access tracks.

Dog exercising

Under the *National Parks and Wildlife (National Parks) Regulations 2001*, dogs are permitted in Shepherds Hill Recreation Park provided they are kept on a lead at all times. This is principally to ensure that other park visitors and native wildlife are protected from interference by free-roaming dogs. However, this regulation is not always adhered to by park users. Exercising dogs on leads is considered appropriate in Shepherds Hill Recreation Park. To ensure that dogs are suitably restrained, better sign-posting and provision of information will be used in the first instance.

Archery

The Eden Field Archers lease area contains a clubroom and a course of set and moveable targets. The built recreational facilities within the leased area of the park are wholly the responsibility of the lessees. These leasing arrangements are discussed in more detail elsewhere in this plan (Section 10.1 Leases and Licences).

Horse Riding

Horse riding has been permitted in Shepherds Hill Recreation Park since 1970. Horse riding in low numbers occurs on the multi-use tracks.

Although it is recognised that horse riding can have a detrimental effect on natural areas, past land clearing and grazing and the already extensive distribution of introduced plant species lessens the potential for horse riding to have a serious impact on this park. Horse riding is therefore accepted as an appropriate activity for this park. It is worth noting that the mounted police unit uses the park for training.

A park-specific code of conduct for horse riders should be jointly developed between DEH, Horse SA and local riders. A code of conduct should include a methodology for the removal of horse manure and the confinement of horses to designated tracks. Horse-oriented information should be provided for riders and advice sought from Horse SA.

The Marion Pony Club lease area contains a levelled dressage ground and a clubroom. Removable 'jumps' are located external to the lease area and used (infrequently) for cross-country events. The built recreational facilities within the leased area of the park are wholly the responsibility of the lessees. These leasing arrangements are discussed in more detail elsewhere in this plan (Section 10.1 Leases and Licences).

Cycling

Mountain bike and BMX riding are increasingly popular recreational activities, and are permitted in Shepherds Hill Recreation Park. While access is currently restricted to designated fire access tracks and the creek area near the Ayliffes Road entrance (Figure 2), mountain bike riding on designated walking trails and illegally constructed trails occurs on a regular basis. The appeal of this area is primarily due to the lack of legal mountain bike opportunities in close proximity to Adelaide, the park's close proximity to residential areas, the extensive network of trails, the variety of opportunities (terrain and trail type) available and the linkages to Blackwood and Belair.

BMX and mountain bike 'dirt jumping' is currently permitted in and around the creek bed area at the Ayliffes Road entrance. The proliferation of trails and the lack of native vegetation in this area detracts from the visual quality of the park. Some trails leading into the dirt jumping area cross the main access track used by authorised vehicles, walkers, horse riders, runners and other cyclists. User conflicts and potential safety risks have been identified with the use of these trails. Closure of some trails and screening using locally indigenous shrubs would improve the visual quality of the entrance and prevent further trail establishment, subsequent user conflicts and site degradation. This area's continued use for riding should be reviewed in conjunction with riders, with consideration given to environmental impacts, sustainability and visitor safety.

Recreational mountain bike riding in this park is popular with people of all ages, fitness and skill levels. The two main forms of mountain bike riding, cross-country and downhill, are both undertaken in the park. Cross-country riding is that style of riding undertaken on a variety of trail types from vehicular tracks to narrow single trails with varying gradients and technical difficulty. Downhill riding focuses on riding a technical descent as quickly as possible. Downhill bikes are designed stronger and with longer travel suspension to be able to clear larger obstacles.

Much of the cross-country mountain bike activity occurs on trails that follow the creek line, many of which were created on an ad hoc basis by both walkers and mountain bike riders. Some of these trails have been specifically created by mountain bike riders and used on an irregular basis by the Adelaide Mountain Bike Club for competition cross-country events. A trail that follows the ridgeline was once used by Insideline Downhill MTB Club for competition downhill events. While the construction of additional trails is prohibited, authorised competition events can still be held on designated trails.

Mountain bike riding on designated trails is a legitimate form of outdoor recreation and requires appropriate management to ensure that it has a minimal impact on natural resources. Currently in Shepherds Hill Recreation Park, mountain bike access is restricted to the fire access tracks and multi-use trails which do not provide the riding experience many mountain bikers are seeking. Consequently, mountain bike riding occurs in inappropriate areas and on designated walking tracks, creating user conflicts. The provision of sustainable multi-use recreational trails that form a system of loops around the park would disperse use, encourage sharing and cooperation between users, reduce the opportunity for visitor conflicts, minimise environmental impact and manage the issues associated with recreational cross-country mountain bike riding. The Mountain Bike Code of Practice should be adhered to by all mountain bike riders in the park.

Recreational and competition downhill mountain bike riding has also occurred in the park. This activity requires specific, well designed tracks to ensure sustainability and avoid user conflict. Numerous downhill specific trails have been illegally constructed in the park between Ridge Track and Viaduct Track and have become heavily eroded as a result of poor construction and heavy use. Some of these downhill trails also end on fire access tracks or cross other trails that are frequently used by walkers, cross-country mountain bike riders and horse riders. These trails are highly unsustainable and management actions should be taken to close and rehabilitate them.

If sustainable downhill trails can not be established in appropriate areas, illegal trails will continue to be constructed in local government and National Parks and Wildlife reserves such as Shepherds Hill Recreation Park. Trail use should be reviewed, and the feasibility of constructing a suitably challenging, sustainable trail between Ridge Track and Viaduct Track should be investigated.

The management of mountain bike riding in Shepherds Hill Recreation Park will require the development of partnerships and a commitment from DEH, Bicycle SA, the Friends of Shepherds Hill Recreation Park, mountain bike clubs, local government and the Office for Recreation and Sport (ORS) to achieve workable outcomes.

Special Events

Park managers have been reasonably successful, to date, in ensuring that special event-type activities are accommodated in the park without problems occurring. Groups wishing to hold special events are required to seek permission from park staff based at Belair National Park. Approval is normally at the discretion of the District Ranger, who must take into account the *National Parks and Wildlife (National Parks) Regulations 2001*, statewide and district policies, and any prescriptions in an approved management plan.

Issues that need to be dealt with on a case by case basis are the potential for environmental impact and conflict with other users, vehicle access, car parking capacity and toilet availability. Areas of the park best suited for events of various kinds should be demarcated and areas of high biodiversity avoided. Event organisers should be required to provide temporary facilities commensurate with the expected number of participants.

Police and emergency services units use the park for training – this use is considered appropriate provided liaison is maintained with managers.

Objective

Provide for sustainable and safe recreation activities in the park.

Strategies

- Continue present management regime to cater for casual recreational use and use by lessees of designated areas.
- Provide signposting to educate users of park regulations.
- Develop a code of conduct between DEH, Horse SA and local horse riders.
- Investigate and consider options for the future use of the creek area near the Ayliffes Road entrance, in conjunction with riders.
- Support and encourage appropriate recreation events in the park.

8.3 Visitor Facilities

Currently there are none of the 'traditional' national park day-visit facilities provided in this park and none are planned, at least in the short-term. Public facilities supplied by DEH are minimal. There is a car park with space for approximately 12 cars at the park entrance from Ayliffes Road.

It has been noted previously that with the exception of the leased zones, solid fuel and gas barbecues are not permitted in this park due to the lack of available wood and the fire risk.

The 1980 visitor survey indicated some public interest in having picnic and barbecue facilities in the park and the first management plan recognised that developing facilities within easy walking distance from Ayliffes Road would cater for both casual visitors and people participating in or watching special events.

However, if day-visit facilities were installed, the potential demand for other improved facilities, particularly toilets, becomes an issue (the old toilet was closed down and demolished some years ago). Moreover, the high cost of establishing facilities and the high incidence of vandalism has made DEH reluctant to install facilities that might prove costly to maintain.

There are limited departmental resources allocated to Shepherds Hill Recreation Park, but in partnership with the community and other agencies, the provision of some visitor facilities, including access to toilets could perhaps be addressed. This matter needs further investigation. New facilities are not contemplated in the term of this management plan – however, they are not ruled out for the future provided that on-going asset management is sustainable and the natural and cultural values of the park are not compromised.

Objective

Maintain the park for self-reliant day visitors.

Strategies

- Manage the park for self-reliant visitor activities without the requirement for the development of visitor facilities.
- Upgrade signs and other information sources for visitors to ensure that they are well-aware of the values of the park and appropriate behaviour.

9 INVOLVING THE COMMUNITY

DEH supports and promotes partnerships and cooperative management arrangements as the best way to progress integrated natural resource management. Achieving positive biodiversity and other outcomes requires the development of effective working relationships with other government agencies, local authorities, non-government organisations and the local community.

The City of Mitcham and the National Trust of South Australia both manage land adjoining Shepherds Hill Recreation Park. The National Trust has had notable success in weed control and encouraging natural regeneration in the Watiparinga Reserve and some of the techniques used have been applied in Shepherds Hill Recreation Park. Co-operation between these three authorities, particularly regarding matters of common interest is, therefore, desirable. The Australian Rail Track Corporation is the other land manager with whom cooperation is most desirable.

For example, the best location for recreation and proposals for linking tracks or trails that may involve the adjoining reserves would benefit from a united approach. Again, weed and fire protection schemes should ideally involve coordinated approach to contiguous reserve land. Establishing and maintaining liaison with City of Mitcham and the National Trust of South Australia over the management of reserves in the locality was an objective of the 1992 management plan and some measure of success has occurred during the term of that plan.

With regard to Shepherds Hill Recreation Park then, a regional management approach requires on-going liaison with the City of Mitcham, National Trust of South Australia, and the Australian Rail Track Corporation. Such an approach also requires effective linkages with ORS, Adelaide and Mount Lofty Ranges NRM Board, Native Title Claimants, the representative Kurna Heritage Committee as nominated by the State Aboriginal Heritage Committee and key community stakeholders (eg Bicycle SA). The management of mountain bike riding in Shepherds Hill Recreation Park will require the development of partnerships between DEH, Bicycle SA, the Friends of Shepherds Hill Recreation Park, mountain bike clubs, local government and ORS to achieve workable outcomes.

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

Friends and Volunteers

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

The Friends of Shepherds Hill Recreation Park were convened in 1999 and have been involved in park support programs since that time. Their involvement to date has been mainly in weed removal and on-going control in the eastern part of the park. This volunteer contribution is invaluable and DEH gratefully acknowledges the Friends' dedication and enthusiasm. It is important for DEH to consult with the Friends and provide support and assistance including legal and policy advice, technical, planning and management direction.

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

Schools and tertiary institutions, in particular, have used the park for education and research and can contribute to better management. Such involvement with education institutions should be encouraged.

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

City of Mitcham

Shepherds Hill Recreation Park is in the City of Mitcham Council area and bordered by residential properties and Council reserves. DEH and the City of Mitcham share on-going land and road management issues, with access to several private properties occurring through the park and with the management of the Council reserves adjacent to the park.

DEH and City of Mitcham may benefit from cooperative management or partnership arrangements on matters of common interest relating to integrated natural resource management of adjoining reserve land and access issues.

National Trust of South Australia

The National Trust of South Australia manages the adjoining Watiparinga Reserve and there are clearly benefits in continuing the cooperative management arrangements that have been established in the past. However, it is essential to understand that Watiparinga Reserve is private (not public land). Watiparinga Reserve is protected by a Heritage Agreement under the *Native Vegetation Act 1991*. This Heritage Agreement is a covenant between the Minister for Environment and Conservation and the National Trust of South Australia for the protection, in perpetuity, of the area of Grey Box (*Eucalyptus microcarpa*) Grassy Woodland for the conservation of its indigenous flora and fauna.

Australian Rail Track Corporation

The Australian Rail Track Corporation has responsibility for the management of the railway land that abuts the south-east corner of the park. Continued cooperation over pest plant management and public access, in particular, would be beneficial.

Recreational Users

The Office for Recreation and Sport has involvement in a wide range of recreational and sporting activities. There are a number of non-government organisations with a particular stake in Shepherds Hill Recreation Park including Walking SA, Bicycle SA and Horse SA.

Adelaide and Mount Lofty Ranges Natural Resources Management Board

The park can benefit from the environmental restoration, conducted by the Adelaide and Mount Lofty Ranges NRM Board, of the creeks in the park. To facilitate integrated natural resource management throughout the catchment, DEH recognises the importance of developing on-going partnership arrangement with officers of the Adelaide and Mount Lofty Ranges NRM Board and participating in regional catchment management programs.

Aboriginal Partnerships

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

Objective

Maintain cooperative working relationships for conservation outcomes.

Strategies

- Provide opportunities for volunteer and community groups to assist in the management and monitoring of the park by facilitating the implementation of programmed activities.
- Consult with the local Council, relevant management boards, the local community and other relevant bodies to explore the benefits of partnership arrangements that will support future management decisions on issues of common interest.
- Build on-going partnerships with Aboriginal groups to support the future management of the park.

10 MANAGING RESERVE TENURE

10.1 Leases and Licences

There are currently two recreational groups who occupy portions of the park under lease arrangements. Buildings to accommodate recreational uses are considered appropriate in the Hills Face Zone, provided any new developments/infrastructure comply with Hills Face Zone Principles. This requirement applies to all new built developments within the park. During the term of the current lease agreements, DEH will encourage lessees to upgrade facilities, when required, in an aesthetic manner that is sympathetic to the local environment. DEH will review the lease requirements for each lease and ensure that the lessees are abiding by the lease conditions.

Eden Field Archers

In 1957, an archery course was established in the park near Ayliffes Road. The originating club was the Southern Archers who later amalgamated with the Eden Field Archers and then moved their course to its present site (Figure 2). Members have carried out tree planting programs and some weed control. The lease expired in 2005 and is currently in a 'hold over' period. Although the present site of the archery facility is satisfactory from an environmental point of view, certain safety aspects were dealt with during the term of the 1992 management plan by demarcating the site more clearly.

The Wattiparringga Creek walking trail passes through the archery lease area. Red flags are displayed when archery is in progress and walkers must detour around at those times. DEH will continue to liaise with the Eden Field Archers to ensure that the appropriate level of safety signage is provided around the lease area. Alternative routes or better methods of delineation will need to be developed to provide options for trail users when access through the archery area is closed as part of a trail rationalisation program (Section 8.1 Visitor Access).

The archery lease area is located a considerable distance from the car park and main park entrance on Ayliffes Road. A scheme to provide access to the archery ground via a track extending from Pasadena Crescent was previously proposed, provided that the City of Mitcham was prepared to allow access through Saddle Hill Reserve. This proposal was rejected by Council.

Erosion of the club car park needs to be addressed. In addition inappropriate earlier plantings must be replaced by indigenous species and local provenance.

Marion Pony Club

In the late 1960s and early 1970s, considerable pressure was exerted by horse riders wishing to use the park. In 1970, formal permission was granted for horses to use the tracks in the park. In the same year, the Marion Pony Club obtained permission to develop a gymkhana area and storage shed on the park.

The Marion Pony Club is currently operating on the holding-over provisions of an expired lease. The club occupies a significant portion of the flatter part of the park that is popular with visitors.

Issues of concern are a poorly located toilet and the associated soakage. Also vehicle access and parking of floats can cause congestion. Many old (cross-country) equestrian jumps remain external to the lease area. These equestrian jumps continue to be used by horse riders, who may or may not be affiliated with the pony club. The club pays for their own water and grassing the dressage area has abated the dust nuisance.

Discussions have commenced into the possibility of re-locating this group to another park, but there has been no resolution to date. Regardless of the outcome of the relocation discussions, DEH needs to maintain on-going liaison with the lessees and regularly review the lease conditions.

Objective

Maintain the operation of the recreational leases within an agreed lease agreement and management framework that is mutually beneficial to all parties.

Strategies

- Monitor and regularly review lease conditions as required ensuring their operation is consistent with the natural and historic values of the park.
- Maintain on-going liaison with the lessees. Initiate discussions regarding access concerns.
- Resolve discussions with the Marion Pony Club regarding potential relocation.
- Encourage any upgrading of leased facilities to comply with Hills Face Zone Principles.

10.2 Public Utilities

Easements for power and water/sewage utilities are routed through this park. There is an existing (underground) power cable on the northern boundary near Ayliffes Road and overhead power lines run adjacent (but external to) the park boundaries. A sewer main runs through the south-west corner of the park.

There is potential for park maintenance work to unwittingly damage utility services and there is equally the potential for park assets to be degraded by insensitive 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 do not interfere with utility services or impact on park values.

There is also a possibility that, sometime in the future, requests may be made to locate additional utility services in the park. It is impossible to canvas the range of possibilities in this management plan (a hypothetical example would be a new telecommunications tower). In general terms however, DEH policy is opposed to the location of such structures on parks except in very special circumstances. Protection of park values should be the priority in all such situations and parks should not be taken as the 'easy option' because they are public land and (usually) remote from residential areas.

Without knowing the specifics of any proposal for new infrastructure, it should first be reviewed against the current policy. Provided that it complies with policy and is in accord with the spirit of this management plan, grant of approval may be given.

Objective

Ensure that the location, operation and maintenance of utility services within the park do not compromise park values.

Strategies

- Maintain accurate records of underground and overhead services to minimise damage through park maintenance and any future development works.
- Maintain liaison with utility companies and periodically review access requirements and maintenance programs.
- Review any proposal for the location of additional utilities on/over the park against the current DEH policy.

SUMMARY OF MANAGEMENT STRATEGIES

MANAGING NATURAL HERITAGE
<p>Geology, Soils and Landform</p> <ul style="list-style-type: none">• Assess soil type and properties, including erosion potential, when planning for future management or visitor access or when undertaking management and development works.• Identify existing areas of erosion and undertake remedial works that may include access exclusion, natural regeneration, revegetation and pest plant removal.
<p>Hydrology</p> <ul style="list-style-type: none">• Manage on-park (and engage with neighbours regarding off-park) activities to minimise adverse impacts on the hydrology and creek systems.• Participate in regional catchment management programs, in partnership with the AMLRNRM Board and the City of Mitcham, in support of flood mitigation and water quality schemes and to minimise any negative impacts to the Shepherds Hill catchment.• Collaborate with the AMLRNRM Board to identify and repair existing areas of erosion through coordinated revegetation and pest plant eradication programs.• Continue to encourage and support the involvement of the Friends of Shepherds Hill Recreation Park and other volunteers in revegetation programs that improve aquatic and riparian vegetation and the monitoring of water quality.• Continue to support the environmental restoration of the park and manage the terrestrial areas of the park in a manner that positively contributes to water quality in the creeks of Shepherds Hill Recreation Park.
<p>Native Vegetation</p> <ul style="list-style-type: none">• Prepare and implement a vegetation management plan for the park and assess natural regeneration, identify rehabilitation priorities and integrate weed control programs according to the recommendations embodied in that plan.• Monitor plant populations and implement individual species management programs if necessary, particularly for the Grey Box and River Red Gum.• Develop and maintain partnership arrangements with the managers of neighbouring properties to ensure that as far as is feasible, efforts at vegetation management are integrated on a regional basis.• Support and encourage the Friends of Shepherds Hill Recreation Park and other volunteers, to continue revegetation programs and to assist with monitoring species of conservation significance in collaboration with DEH.• Take account of possible <i>Phytophthora cinnamomi</i> introduction/spread when planning access routes or management and development works that involve movement of soil or machinery.• Continue to promote awareness amongst DEH staff and the wider community of the potential for introduction and establishment of <i>Phytophthora cinnamomi</i>, the plant species susceptible to it and indicators of its presence.
<p>Native Fauna</p> <ul style="list-style-type: none">• Encourage approved volunteer groups and individuals to conduct fauna surveys and undertake population monitoring. Investigate opportunistic sightings to verify species identification.• Identify and protect significant fauna habitats and integrate habitat restoration with native revegetation efforts and weed management programs.

<p>Introduced Plants</p> <ul style="list-style-type: none"> • Encourage the development of and contribute to integrated regional weed control programs that will establish pest plant control priorities and strategies, and combine weed control with native plant revegetation efforts on neighbouring land.
<p>Introduced Animals</p> <ul style="list-style-type: none"> • Monitor 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. • If control programs prove necessary, work in cooperation with adjoining landowners, Adelaide and Mount Lofty Natural Resources Management Board, the City of Mitcham, the Friends of Shepherds Hill Recreation Park and the wider community to achieve effective pest animal control.
<p>MANAGING FIRE</p> <ul style="list-style-type: none"> • Implement and review the <i>Draft Reserves of the Southern Foothills, Mount Lofty Ranges Fire Management Plan</i> (2007) in association with CFS and other stakeholders. • Continue to work with the Mitcham Bushfire Prevention Committee and CFS and comply with provisions of the <i>Emergency Management Act 2005</i> to minimise risk to life and property within and surrounding the park, including the suppression of fires as soon as possible.
<p>MANAGING CULTURAL HERITAGE</p> <p>Aboriginal Heritage</p> <ul style="list-style-type: none"> • 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. <p>Non-Aboriginal Heritage</p> <ul style="list-style-type: none"> • Consult Heritage Branch of DEH and the Mitcham Heritage Research Centre before removing introduced trees. • Cooperate with relevant authorities and organisations to protect any sites or items of non-Aboriginal heritage significance that are discovered in the future.
<p>MANAGING TOURISM AND RECREATION</p> <p>Visitor Access</p> <ul style="list-style-type: none"> • Permit horse riding and mountain biking on designated trails. • Undertake Trails Master Planning and establish a track and trail rationalisation/maintenance program to provide clearly defined routes for visitors while eliminating duplication and reducing impacts on park values. • Investigate popular recreation routes linking with other adjoining or nearby recreation areas and provide access points to avoid illegal entry and exiting of the park. • Investigate feasibility of creation of sustainable mountain bike trails and maintain, improve and repair (or close or relocate) access tracks and walking trails to stabilise soil as required. • Establish and maintain liaison with walking, horse riding, mountain bike riding and other specialist user groups and event organisers, and develop and implement appropriate codes of conduct.

<p>Visitor Activities</p> <ul style="list-style-type: none"> • Continue present management regime to cater for casual recreational use and use by lessees of designated areas. • Provide signposting to educate users of park regulations. • Develop a code of conduct between DEH, Horse SA and local horse riders. • Investigate and consider options for the future use of the creek area near the Ayliffes Road entrance, in conjunction with riders. • Support and encourage appropriate recreation events in the park.
<p>Visitor Facilities</p> <ul style="list-style-type: none"> • Manage the park for self-reliant visitor activities without the requirement for the development of visitor facilities. • Upgrade signs and other information sources for visitors to ensure that they are well-aware of the values of the park and appropriate behaviour.
<p>INVOLVING THE COMMUNITY</p> <ul style="list-style-type: none"> • Provide opportunities for volunteer and community groups to assist in the management and monitoring of the park by facilitating the implementation of programmed activities. • Consult with the local council, relevant management boards, the local community and other relevant bodies to explore the benefits of partnership arrangements that will support future management decisions on issues of common interest. • Build on-going partnerships with Aboriginal groups to support the future management of the park.
<p>MANAGING RESERVE TENURE</p> <p>Leases and Licences</p> <ul style="list-style-type: none"> • Monitor and regularly review lease conditions as required ensuring their operation is consistent with the natural and historic values of the park. • Maintain on-going liaison with the lessees. Initiate discussions regarding access concerns. • Resolve discussions with the Marion Pony Club regarding potential relocation. • Encourage any upgrading of leased facilities to comply with Hills Face Zone Principles.
<p>Public Utilities</p> <ul style="list-style-type: none"> • Maintain accurate records of underground and overhead services to minimise damage through park maintenance and any future development works. • Maintain liaison with utility companies and periodically review access requirements and maintenance programs. • Review any proposal for the location of additional utilities on/over the park against the current DEH policy.

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APPENDIX: CONSERVATION STATUS CODES

Australian Conservation Status Codes

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

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

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

South Australian Conservation Status Codes

The following codes are based on the current listing of species under Schedules of the *National Parks and Wildlife Act 1972*, as amended in 2008. To align with other States, Territories and the Commonwealth (EPBC Act) listing categories and ratings, the IUCN criteria were used as a basis for determining threatened species status under the *National Parks and Wildlife Act 1972*. For IUCN criteria see:

IUCN (1994) *IUCN Red List Categories*. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland (www.redlist.org).

IUCN (2001) *IUCN Red List Categories and Criteria: Version 3.1*. IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, United Kingdom (www.redlist.org).

- E Endangered:** (Schedule 7) in danger of becoming extinct in the wild.
- V Vulnerable:** (Schedule 8) at risk from potential or long term threats which could cause the species to become endangered in the future.
- R Rare:** (Schedule 9) low overall frequency of occurrence (may be locally common with a very restricted distribution or may be scattered sparsely over a wider area). Not currently exposed to significant threats, but warrants monitoring and protective measures to prevent reduction of population sizes.

Regional Status Codes

The categories below apply to the species distribution at a regional level. There are no regional conservation status categories developed for mammals, reptiles or amphibians to date.

Birds

Regional conservation status for birds follow:

Carpenter and Reid (1998) *The Status of Native Birds in the Agricultural Areas of South Australia*. Unpublished and regularly updated database.

The regions are defined as follows:

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

Plants

Regional conservation ratings for plants follow:

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

January (2001) update of unpublished database: *Florlist*. Department for Environment and Heritage.

The regions are as defined by the State Herbarium (Plant Biodiversity Centre), illustrated in the back cover of *Census of South Australian Vascular Plants (Edition V)* (Eds. B Barker, R Barker, J Jessop and H Vonow, 2005).

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

In order of decreasing conservation significance:

- X** **Extinct/Presumed extinct:** not located despite thorough searching of all known and likely habitats; known to have been eliminated by the loss of localised population(s); or not recorded for more than 50 years from an area where substantial habitat modification has occurred.
- E** **Endangered:** rare and in danger of becoming extinct in the wild.
- T** **Threatened:** (*Plants only*) likely to be either Endangered or Vulnerable but insufficient data available for more precise assessment.
- V** **Vulnerable:** rare and at risk from potential threats or long term threats that could cause the species to become endangered in the future.
- K** **Uncertain:** likely to be either Threatened or Rare but insufficient data available for a more precise assessment.
- R** **Rare:** has a low overall frequency of occurrence (may be locally common with a very restricted distribution or may be scattered sparsely over a wider area). Not currently exposed to significant or widespread threats, but warrants monitoring and protective measures to prevent reduction of population sizes.
- U** **Uncommon:** less common species of interest but not rare enough to warrant special protective measures.
- Q** **Not yet assessed:** but flagged as being of possible significance.
- N** **Not of particular significance:** (*Plants only*) Also indicated by a blank entry.
- C** **Common:** (*Birds only*) Also indicated by a blank entry.
- O** **Occasional Visitor Only:** (*Birds only*) Not considered of conservational status.