

Department for Environment and Heritage Management Plan



Totness Recreation Park 2007

This plan of management was adopted on 23 January 2007 and was prepared pursuant to section 38 of the *National Parks and Wildlife Act 1972*.



Government of South Australia

Department for Environment
and Heritage

Published by the Department for Environment and
Heritage, Adelaide, Australia

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ISBN: 1 921238 92 5

Cover Photography: The old railway dam in the northern
section of Totness Recreation Park (courtesy of
Liesl Garrett, DEH)

This document may be cited as "Department for
Environment and Heritage (2007) *Totness Recreation
Park Management Plan*, Adelaide, South Australia"

FOREWORD

Totness Recreation Park is located in the Central Mount Lofty Ranges, approximately 25 kilometres south-east of Adelaide, 2.5 kilometres from Mount Barker and five kilometres from Hahndorf. The park was proclaimed on 22 January 1972 under the *National Parks and Wildlife Act 1972*, to protect natural habitat and provide recreational opportunities for the local community. When the South Eastern Freeway was constructed it dissected Totness Recreation Park into two uneven portions totalling 41 hectares.

Totness Recreation Park supports a variety of native plants and animals, including five floristic communities and a wetland community. Plant and animal species of conservation significance recorded within the park include the state rare Manna Gum (*Eucalyptus viminalis* ssp. *viminalis*) and Bassian Thrush (*Zoothra lunulata*), and the regionally rare Spider Orchid (*Caladenia minor*) and Shining Bronze-cuckoo (*Chrysococcyx lucidus*). Unfortunately, much of the park is dominated by Gorse (*Ulex europaea*), a weed that has proved a serious threat to biodiversity.

The land comprising Totness Recreation Park was traditionally associated with the Peramangk people of the Mount Barker Area.

The dam in the northern section of the park has links with South Australia's railway history. Constructed in 1884, the dam was used to supply the steam locomotives travelling to and from Victor Harbor until 1955. Today, the dam provides visitors with a pleasant walk around its perimeter and also provides for some recreational shore-based fishing. Totness Recreation Park also has historic associations with the wattle bark industry that flourished in the Mount Barker district during the late 1800s and early 1900s.

The management plan for Totness Recreation Park focuses on conserving the biodiversity of the Central Mount Lofty Ranges (particularly through weed control and eradication), while providing low-key recreational opportunities.

The draft plan for Totness Recreation Park was released for public exhibition in June 2006. At the close of the comment period, seven submissions were received, raising issues that mainly concerned recreational pursuits within the park. All comments and concerns were considered by the Adelaide Consultative Committee and forwarded to the South Australian National Parks and Wildlife Council for advice before the plan was presented for adoption.

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



HON GAIL GAGO MLC

MINISTER FOR ENVIRONMENT AND CONSERVATION



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ACKNOWLEDGEMENTS

In 2000 the Friends of Totness prepared an initial draft management plan, which provided sound and comprehensive information about the park. The hard work and commitment of those who contributed to that earlier document is gratefully acknowledged. Other groups and individuals that provided valuable assistance, information and comments during the production of this management plan are also acknowledged.

1 PARK LOCATION AND FEATURES

In 1970 the land that is now Totness Recreation Park, formerly the property of the South Australian Railways and the Department of Transport, was transferred to the (former) National Parks Commission and dedicated for reserve purposes, under the *National Parks Act 1966*. Totness Recreation Park was constituted in 1972 under the new *National Parks and Wildlife Act 1972* to protect natural habitat and provide recreational opportunities for the local community. The park comprises section 124, Hundred of Macclesfield. It was constituted free of access under State mining legislation.

The 41 hectare park straddles the South Eastern Freeway about 25 kilometres south-east of Adelaide. It is approximately 2.5 kilometres from Mount Barker and about five kilometres from historic Hahndorf (Figure 1). Totness Recreation Park is an irregularly shaped park, split by the freeway into two unequal portions: a smaller, northern section of approximately nine hectares and a larger, southern section of approximately 32 hectares. The only connection between the two sections is a concrete storm water pipe under the freeway.

Totness 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.

Totness Recreation Park experiences cool wet winters and warm to hot dry summers. Average annual rainfall is 780 millimetres, most of which falls during the winter months from May to August.

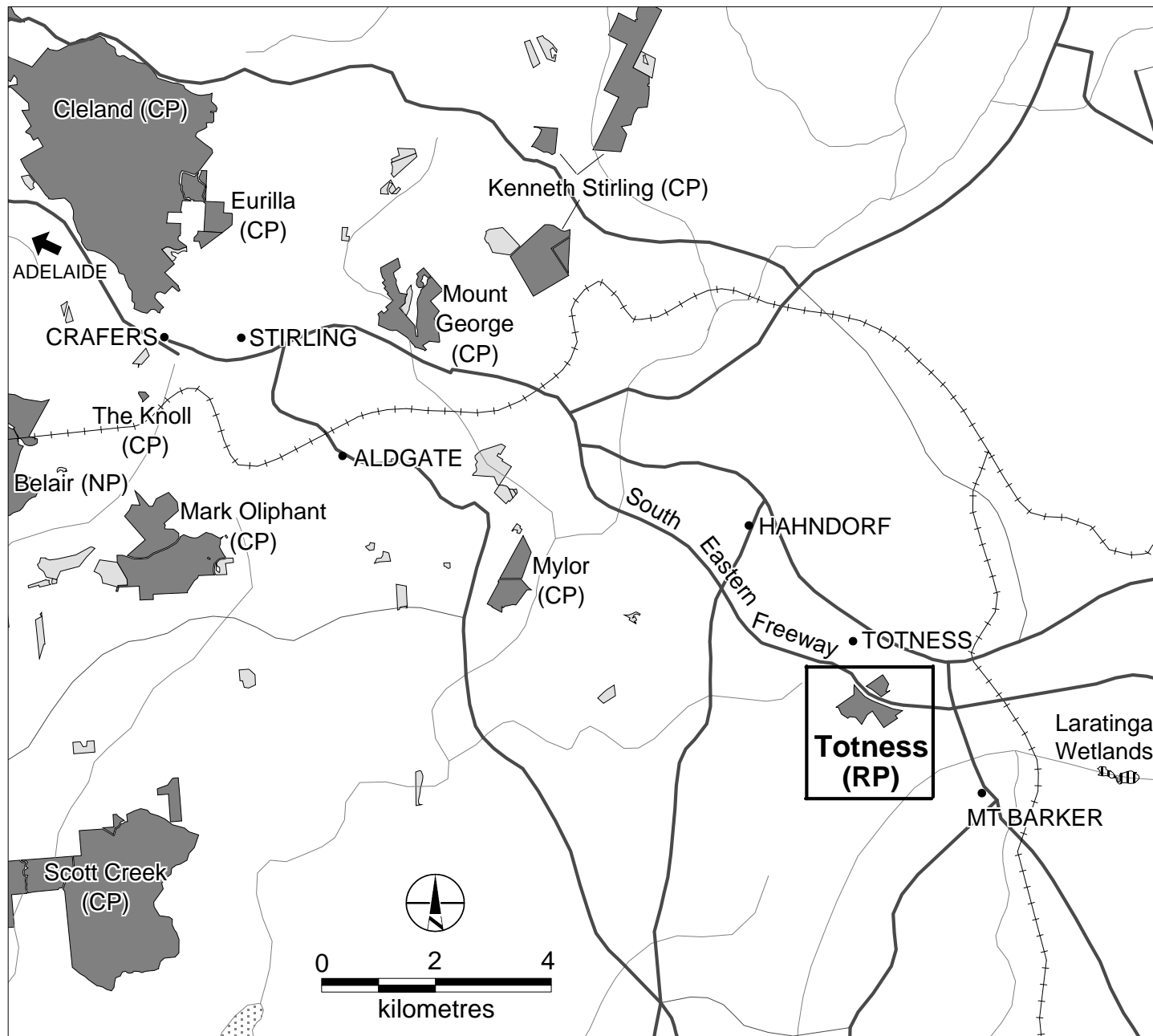
Despite its small size and the presence of numerous weeds, particularly Gorse (*Ulex europaea*), the park supports a variety of native plants and animals, including some threatened species. It retains some reminders of its previous landuse, with the former railway dam an historic feature in the northern section. The park has no facilities apart from the dam and a network of tracks and trails, and is probably not well known outside the local area. At present, relatively small numbers of visitors use the park for outdoor recreation, mainly to walk, fish or ride mountain bikes.

Although located in a district with an expanding human population, the park is bounded by rural grazing properties. Land uses in the surrounding area include grazing, cropping, horticulture, light industry and rural living. Several patches of remnant native vegetation are nearby which, together with the park, comprise an important habitat resource. Other National Parks and Wildlife Act reserves in the vicinity of Totness Recreation Park include Kenneth Stirling, Mark Oliphant, Mount George and Mylor Conservation Parks. Scott Creek Conservation Park is of reasonable size (714 hectares) but the other parks are all smaller than 250 hectares each (see Figure 1).

The park terrain is rather hilly, with the southern section supporting Messmate Stringybark (*Eucalyptus obliqua*) open forest with a sclerophyll understorey on the higher elevations and a grassy understorey lower down. Stringybark woodland is also found in the northern section across the freeway, where it occurs with a highly modified, herbaceous understorey interspersed with shrubs. Both sections of the park include small areas of South Australian Blue Gum (*Eucalyptus leucoxylon*) open woodland with grassy understoreys.

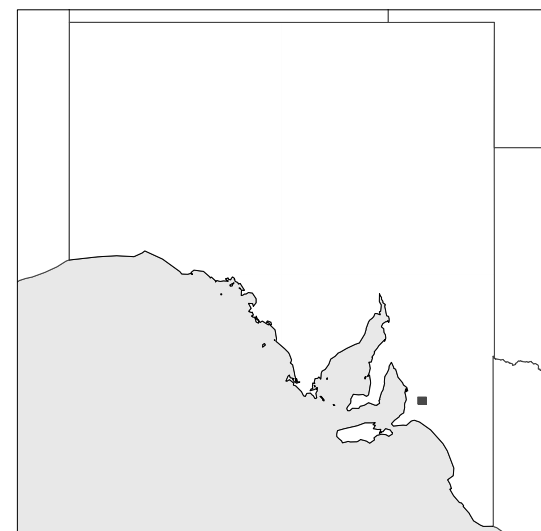
In addition, the northern section includes stands of Manna Gum (*Eucalyptus viminalis*) and River Red Gum (*Eucalyptus camaldulensis*) open woodland occurs on the wetter area around the dam. Both Blue Gum and Manna Gum woodlands are considered to be of regional conservation significance.

A 5.8 hectare portion of the park is currently licensed to a private landholder for grazing purposes. This triangular-shaped area is located at the eastern end of the park's southern section. It is mostly cleared of vegetation and, apart from a few scattered trees, is dominated by Phalaris (*Phalaris* sp.).

**Figure 1****Totness Recreation Park****Location****LEGEND**

	DEH Reserve		Major Road
	Heritage Agreement		Minor Road
	Council Property		Railway
(CP)	Conservation Park		Drainage
(CR)	Conservation Reserve		
(NP)	National Park		
(RP)	Recreation Park		

Map designed and created by
Reserve Planning using PAMS
Projection: MGA Zone 54 (GDA 94)
Date: December 2005



1.1 History of Management

When the National Parks Commission took control of the park in 1970, the land was badly infested with introduced plants and was in a seriously degraded condition. Gorse dominated the understorey over much of the northern section, while Blackberry (*Rubus* sp.) and Dog Rose (*Rosa canina*) smothered the wetter areas. The vegetation in the southern section was recovering from years of timber cutting.

However, since the early 1980s management effort has been directed at controlling Gorse, with some success. In addition, upgraded boundary fencing has excluded straying stock and this, with the reduction of Gorse, has allowed native species to regenerate. Nevertheless, introduced plants remain the major problem facing park managers.

Management access tracks have been constructed adjacent to boundary fence lines and signs have been erected at the two main entrances, identifying the park to visitors and recreational activities permitted. Slashing is undertaken each year to reduce grass growth as a fuel reduction measure. It should be noted that the southern section of the park was completely burnt out in the Ash Wednesday bushfire of 1983. Indications of that conflagration are still visible more than 20 years later. To improve pedestrian access to the south side of the dam, a boardwalk was constructed across a boggy wetland area where traverse was previously very difficult.

In 1980 some Big-headed Gudgeons (*Philypnodon grandiceps*) were released into the dam. Evidently these small native freshwater fish, commonly found in creeks and rivers in South Australia, were intended as a dietary supplement for the introduced Redfin Perch (*Perca fluviatilis*), the main target of the recreational anglers who use the dam. There appears to have been no follow-up to that release.

Small numbers of European Rabbits (*Oryctolagus cuniculus*) can be found on the park. The rabbit population fluctuates with the seasons, subject to the prevalence of Rabbit-specific diseases. Some years ago, Transport SA independently undertook a one-off 1080 poisoning project to eradicate rabbits from the park. However, without any follow-up, the success of that project was limited (see Section 5.6 Introduced Animals).

In 2000 the Friends of Totness prepared a draft management plan for the park, which provided useful information for the present document. The Friends have also contributed in other ways, by undertaking weed control work to encourage the regeneration of native plant species.

2 LEGISLATIVE FRAMEWORK

2.1 National Parks and Wildlife Act 1972

The Director of National Parks and Wildlife is responsible for managing reserves (with the exception of certain reserves co-managed with traditional Aboriginal custodians) subject to any direction from 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;
- insofar as a reserve is located wholly or partly within the Murray-Darling Basin, the promotion of the objects of the *River Murray Act 2003* and the *Objectives for a Healthy River Murray* under that Act; 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 ultimately the Minister ultimately decides whether to adopt a management plan.

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 will be 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*.

2.3 River Murray Act 2003

The *River Murray Act 2003* provides an administrative framework for the protection and enhancement of the River Murray, related areas and ecosystems. Management plans relating to a reserve located wholly or partly within the Murray-Darling Basin must seek to further the objects of the *River Murray Act 2003* and a series of statutory objectives relating to river health, environmental flows, water quality and the human dimension (ie the Objectives for a Healthy River Murray). The Act's objects and the Objectives for a Healthy River Murray have been taken into account in the preparation of this plan.

The watercourses in Totness Recreation Park influence the Eastern Mount Lofty Ranges Region of the Murray-Darling Basin. Hence, this management plan will seek to further the objects of the *River Murray Act 2003*, through the objectives and strategies relating to the management of the park's hydrology and related areas.

3 VISION

The vision for Totness Recreation Park is a park that contributes to regional biodiversity conservation in the Central Mount Lofty Ranges, helping local populations of native plants and animals survive into the future, while providing low-key recreational opportunities.

4 ZONING

Section 39 of the *National Parks and Wildlife Act 1972* provides for the designation of zones in a park. Zoning helps ensure that public use and management actions are compatible with the protection of park values. It constrains the use of land in zones to conditions specified in an adopted management plan. The two management zones described below and depicted in Figure 2 will establish a blueprint for the sustainable management of Totness Recreation Park for the duration of this plan.

The proposed change in reserve status to Conservation Park (see Section 10.1 Reserve Classification) implies that the entire park will be managed primarily for the purpose of biodiversity conservation and that public use will be limited to activities that are compatible with the protection of natural and cultural assets. Visitor facilities (such as walking trails) should not impact on sites of high conservation value.

Conservation Zone

The Conservation Zone comprises the majority of the park. The primary management objective in this zone is biodiversity conservation, however low-impact recreational activities will be allowed. Bushwalking, interpretation and education, scientific research and nature appreciation will be permitted in the Conservation Zone. Dogs will be permitted throughout the zone, provided they are leashed at all times and under the control of a responsible person. Fishing will be permitted in the railway dam, however swimming in the dam will be prohibited. Horse riding and bicycles will not be permitted in this zone.

Works to achieve conservation goals are permissible, as is prescribed fire, maintenance of the dam structure, and track and trail maintenance. If necessary to meet the requirements of visitor use, a small car parking area may be established in the southern section of the park at the Paechtown Road/Haines Fire Track entrance (gate 6) (see Figure 2 and Section 8.2 Visitor Access).

Prescription

- Protect the environmental values of the zone through the exclusion of the following activities:
 - horse riding;
 - cycling; and
 - motor vehicles (including motor cycles) except for management or emergency purposes.
- Ensure all visitors to the park are aware of the constraints that apply to this zone.
- Ensure that as far as possible, access tracks and walking trails within the zone do not traverse significant vegetation communities. If this has occurred, consider the closure of the particular track/trail or techniques to avoid further impacts.
- Built structures should not be constructed in this zone (except for signs, fences and simple visitor facilities).

Licensed Zone

This zone comprises the small portion of the southern section of the park that is currently licensed (on an annual basis) for grazing. Under the current terms and conditions of the licence agreement, the licensee has responsibility for land management and public use is excluded. Development and building works are not permitted in the Licensed Zone, but actions to reduce threats to biodiversity are a condition of the licence agreement. The long-term intention is for this area to be revegetated and integrated with the remainder of the park. Once that is accomplished, grazing will no longer be required (see Section 10.2 Leases and Licences) and this area will revert to Conservation Zone.

Prescription

- Subject to annual review, issue a grazing licence for the Licensed Zone for such time as grazing is considered an effective management strategy. Exclude public access from the licensed area.
- Encourage the licensee to undertake management activities to curb threatening processes and impacts on the regeneration of native species, with the long-term aim of ecological restoration.

Objective

Zone Totness Recreation Park to ensure appropriate land 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.

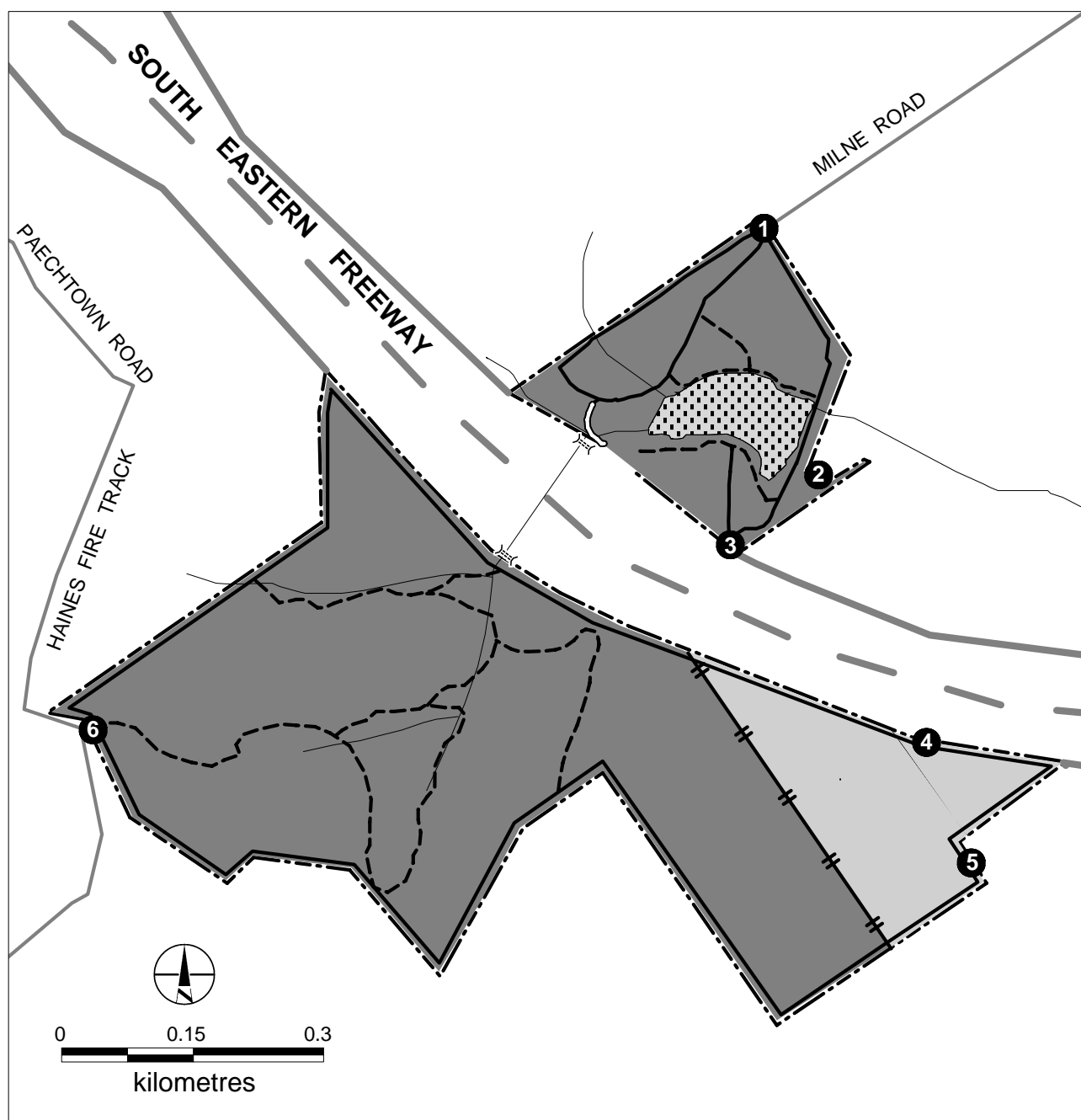















Figure 2

**Totness Recreation Park
Zoning and Features**

LEGEND

	Conservation Zone		Major Road
	Licensed Zone		Minor Roads
	Reservoir		Management Track/Walking Trail
	Park Boundary		Walking Trail
	Gate Number		Fence
	Drain Under Freeway		Boardwalk
			Drainage

Map designed and created by
Reserve Planning using PAMS
Projection: MGA Zone 54 (GDA 94)
Date: December 2005

5 MANAGING NATURAL HERITAGE

5.1 Geology, Soils and Landform

Totness Recreation Park occupies hill slopes on the eastern side of a ridgeline formed from folded sediments of the Adelaide Geosyncline. These ridges, along the Bull Creek Range, are the watershed dividing the Onkaparinga and Bremer River catchments. The southern section of the park retreats from a high point on the south-west corner near the Paechtown Road/Haines Fire Track entrance (gate number 6) to a lower elevation on the northern boundary near the pipe under the freeway. The northern section comprises south and north-east facing slopes, and from these slopes a number of shallow gullies drain down to the dam and into the headwaters of Mount Barker Creek (see Figure 2).

Quartzite and sandstones feature prominently in the park's geological formations and the well drained, yellow podsollic soils that have developed on the weathering bedrock are strongly leached and infertile. Soils on the slopes have shallow, A-horizons of gritty sands overlying B-horizons of friable, sandy clays, with abundant stone. The water-holding capacity of these soils is low and consequently conditions for root development are poor. In the gullies, however, soils can be moderately deep and the wetter areas can become boggy in winter.

Although soil erosion is not a major issue at present, and most of the tracks and trails appear relatively stable under current levels of use, increased foot traffic and storm water run-off could accelerate erosion on the steeper slopes and gullies. Some bare earth areas have developed near the dam where visitors congregate to fish and make campfires. Rabbits have also disturbed the soil structure at a number of locations in the northern section of the park by over-grazing, scratching and burrowing.

Ideally, on-park activity should not increase the likelihood of soil disturbance or erosion, and recreational activities should be monitored and managed effectively to minimise unnecessary damage. Park managers should take soil type into account when making decisions on acceptable types of recreational activity, or when locating and constructing tracks and trails. The siting of access routes should be done so as to minimise problems with soil erosion or seasonally wet conditions. Care should also be taken when the licensee or volunteers undertake weed-control operations, because introduced species may be stabilising the soil and will need to be replaced promptly with native species.

Soil salinisation is not thought to be an issue at this point in time. However, future trends are uncertain and investigation and liaison with regional authorities, including the South Australian Murray-Darling Basin (SA MDB) Natural Resources Management (NRM) Board, is needed on this aspect (see Section 9 Involving the Community).

Objective

Conserve the soils within the park and limit erosion to natural levels.

Strategies

- Assess soil type and properties, including seasonal wetting or erosion potential, when planning access routes and when undertaking management activities.
- Identify any existing areas of erosion or disturbance and undertake remedial works.
- Avoid inappropriate development and control activities that may unduly erode soils.
- Ensure pest plant removal projects are staged and complemented by natural regeneration or revegetation to maintain soil stability.
- Maintain liaison and work cooperatively with the SA MDB NRM Board with regard to regional soil conservation measures.

5.2 Hydrology

The former railway dam is a prominent feature in the northern section of the park. The catchment for the dam includes all of the northern section and most of the southern section. Overflow from the dam runs onto a low-lying area on a neighbouring property immediately to the east of the park, and from there to the Mount Barker Creek and eventually the Bremer River.

The dam has been in place for many years and the overflow does not appear to be creating problems either locally or further downstream in the Bremer Barker Catchment area. At present, the integrity of the dam wall and overflow channel appears secure, however DEH will monitor the condition and will manage it accordingly. As well as being of some historic interest (see Section 7.2 Non-Indigenous Heritage), the dam provides valuable freshwater habitat for many native fauna species and is a recreational resource. For those reasons, the dam should be retained, despite its artificiality. During the term of this management plan, works necessary to maintain the dam structure are permissible.

The remainder of the dam catchment comprises small rural properties, the majority of which are used for grazing. Run-off from these properties enters the park but the contributory effect on water quality is currently unknown. There is also a small amount of storm water input (into the streams feeding the dam) from the South Eastern Freeway. Concern has been expressed (Friends of Totness, 2000) that such input may be polluting the dam water with heavy metals, although that has not been confirmed.

Given the lack of information on surface water quality, it would be beneficial to commence regular monitoring of the dam water to establish some baseline data for analysing future trends and potential risks to wetland species. Tertiary institutions or other qualified authorities who may be interested in undertaking this work should be encouraged to do so. Such studies could include sampling the quality of surface water in the surrounding catchment and investigating its interaction with the ecological systems on the park. It would also be worthwhile conferring with Transport SA regarding the volume and quality of road run-off.

Although rising saline groundwater is an issue of major concern in many areas of rural South Australia, the likelihood of this affecting the park and the longer-term trends in local groundwater are not well known. The extent and nature of local aquifers and groundwater contribution to water levels in the dam and the effects (if any) on the park's aquatic ecosystems are not clear either. However, it is thought that groundwater levels and salinity in the Mount Barker area are relatively stable, albeit high (Parsons Brinckerhoff, 2004). Given the importance of the dam and its associated wetland habitat, it would be worthwhile investigating and recording trends in groundwater salinity levels as a guide for future management.

Park managers should establish and maintain contact with the relevant authorities with regard to the broader catchment, groundwater and salinity management issues. These include the District Council (DC) of Mount Barker, the Bremer Barker Catchment Group and the SA MDB NRM Board (see Section 9 Involving the Community).

Objective

Monitor the park's hydrological systems (surface and groundwater) and maintain or improve the water quality of the wetland, while ensuring that on- and off-park activities do not impinge adversely on the park's hydrological and water-dependent habitats.

Strategies

- Encourage and support studies into the water quality of the dam and aquatic ecosystems to ensure habitat is conserved for native fauna.
- Liaise with the SA MDB NRM Board, Bremer Barker Catchment Group and other relevant authorities with regard to the broader catchment, groundwater and salinity management issues as they relate to Totness Recreation Park.
- Seek to further the objectives of the *River Murray Act 2003* when managing the park's hydrology.

5.3 Native Vegetation

Totness Recreation Park is located on the eastern slopes of the Central Mount Lofty Ranges, in a zone where understoreys are trending from sclerophyll to savanna. The park, although small, includes five floristic communities and a wetland community. It is a remnant area of natural habitat in a region where most native vegetation has been cleared, and what remains are fragmented patches exposed to grazing and other agricultural pursuits.

The northern section of Totness Recreation Park includes the following vegetation communities:

- Messmate Stringybark woodland – *Eucalyptus obliqua* over *Acacia paradoxa*, *Bursaria spinosa*, *Olearia ramulosa* over *Lepidosperma semiteres*, *Lomandra densiflora*;
- South Australian Blue Gum/Manna Gum woodland – *Eucalyptus leucoxylon*/*Eucalyptus viminalis* ssp. *viminalis* over *Stipa* spp., *Danthonia* spp., *Cheilanthes* sp.;
- River Red Gum woodland – *Eucalyptus camaldulensis* over *Acacia retinodes* over *Eleocharis acuta*, *Carex tereticaulis* and introduced grasses; and
- Narrow Leaf Cumbungi sedgeland – dominated by *Typha domingensis*.

The southern section of the park includes the following vegetation communities:

- Messmate Stringybark open forest – *Eucalyptus obliqua* over a diverse heath understorey; and
- South Australian Blue Gum woodland – *Eucalyptus leucoxylon* over *Acacia pycnantha* over *Stipa* spp., *Danthonia* spp. +/- *Cheilanthes* sp.

Blue Gum and Manna Gum woodlands are plant communities of conservation significance at both a local and regional level. The former is rated as vulnerable in the Bremer Barker Catchment area and as threatened in the Murray-Darling Basin, while the latter is rated as endangered in the Bremer Barker Catchment area.

More than 180 native plant species have been recorded within Totness Recreation Park. Manna Gum (*Eucalyptus viminalis* ssp. *viminalis*), the only species of rated conservation significance under the *National Parks and Wildlife Act 1972*, is considered to be rare in South Australia. However, there are numerous plant species of regional conservation status. Table 1 lists plant species of conservation significance that have been recorded within Totness Recreation Park.

Table 1: Plants of Conservation Significance Recorded within Totness Recreation Park.

Scientific Name	Common Name	Conservation Status*	
		SA	Southern Lofty
<i>Austrostipa pubinodis</i>	Long-shaft Spear-grass		U
<i>Caladenia minor</i>	Spider Orchid		R
<i>Cynoglossum suaveolens</i>	Sweet Forget-me-not		U
<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	Manna Gum	R	R
<i>Lomandra nana</i>	Small Mat-rush		R
<i>Lomandra sororia</i>	Sword Mat-rush		U
<i>Senecio hispidulus</i> var. <i>hispidulus</i>	Fireweed		U
<i>Senecio squarrosus</i>	Fireweed		R

* See Appendix for Conservation Status Codes

In terms of environmental quality, the southern section of the park is probably of greater ecological integrity, although it comprises mostly regrowth of coppice Stringybark and dense stands of Golden Wattle (*Acacia pycnantha*). This regrowth condition probably reflects historic timber cutting and wattle bark harvesting, compounded by the Ash Wednesday bushfire of 1983. It is considered that the biodiversity conservation effort should be directed initially on this southern section.

The long-term management aim is to restore and maintain the integrity of native vegetation communities on the park. To date this has mainly involved attempts at controlling introduced plants, particularly Gorse (see Section 5.5 Introduced Plants). The strategy will be to focus on managing threats (eg introduced species), while encouraging natural regeneration and gradually reinforcing the area of high quality natural habitat. In areas where natural regeneration is not a feasible option (eg in cleared areas dominated by *Phalaris*), revegetation with indigenous species of local provenance is an acceptable alternative.

To provide clear purpose and direction, as well as continuity over time, a vegetation management plan should be prepared, including a plan to progressively revegetate the licensed zone (see Section 10.2 Leases and Licences). This plan will steer management programs such as weed control, fire track maintenance and fuel reduction. Having such a plan will allow long-term priorities to be set, while park managers and volunteer groups will have clear priorities and detailed prescriptions to guide their activities.

Without pre-empting the vegetation management plan, to preserve the integrity of the more intact vegetation remnants (ie the southern section) it is recommended that, as far as possible, a minimal disturbance approach is taken to weed control (see Section 5.5 Introduced Plants). The locations of plants of conservation significance should be recorded in the vegetation management plan so as to avoid inadvertent damage.

In the longer term, the intention is to progressively revegetate the 5.8 hectare Licensed Zone area currently utilised for grazing. A strategy should be implemented to protect and build on the vegetation remnants in that area and involve the licensee in the ecological restoration activities (see Section 10.2 Leases and Licences).

DEH is willing to partner other agencies, volunteer groups and landowners adjacent 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. Park managers should establish and maintain contact with the owners and managers of nearby areas of native vegetation regarding opportunities for collaborating on biodiversity conservation programs.

Phytophthora

Phytophthora cinnamomi (*Phytophthora*) 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. *Phytophthora* is suspected to be present in the southern section of Totness Recreation Park. While not yet suspected in the northern section, suitable climatic and soil conditions, and the presence of susceptible vegetation are such that the threat of infestation is very high.

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 preventative devices at park entrances (eg boot cleaning stations), 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.

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.

Objectives

Protect and restore the native vegetation on the park and reduce threats to biodiversity, particularly to those plants or communities of conservation significance.

Reduce the possibility of the introduction or spread of the soil-borne pathogen *Phytophthora*.

Strategies

- Prepare and implement a vegetation management plan that encourages natural regeneration, integrates introduced plant control programs with park management activities, and incorporates the licensed zone.
- Ensure native vegetation management and revegetation efforts are integrated on a regional basis.
- Support and encourage the Friends of Totness, other volunteer organisations and the licensee to undertake rehabilitation and monitoring programs in collaboration with DEH staff.
- Continue to promote awareness amongst DEH staff and the wider community of the potential for introduction and establishment of *Phytophthora*, the plant species susceptible to it and indicators of its presence.
- Ensure vehicles, equipment and footwear are clean prior to entering the park, and that all raw material, such as rubble, gravel, sand, soil and water, and all plants, brought into the park is free of *Phytophthora*.
- Continue to monitor the suspected infestation of *Phytophthora* in the park. If confirmed, implement programs to contain this pathogen and to restrict the movement of visitors and management staff through infected areas.

5.4 Native Fauna

Totness Recreation Park was included in biological survey of the Southern Mount Lofty Ranges (Armstrong et al., 2003). This survey, along with casual observation, indicated a variety of native birds and other fauna regularly use the area. Thirty-six species of native bird have been recorded, with the large eucalypts in the northern section providing nesting sites for the Adelaide Rosella (*Platycercus elegans*) and Laughing Kookaburra (*Dacelo novaeguineae*). Table 2 lists the numerous species of conservation significance that have been recorded within Totness Recreation Park, two of which are rated under the *National Parks and Wildlife Act 1972*.

Table 2: Birds of Conservation Significance Recorded within Totness Recreation Park.

Scientific Name	Common Name	Conservation Significance*	
		SA	Mount Lofty
<i>Aegotheles cristatus</i>	Australian Owlet Nightjar		U
<i>Calyptorhynchus funereus</i>	Yellow-tailed Black Cockatoo	V	V
<i>Chrysococcyx lucidus</i>	Shining Bronze-cuckoo		R
<i>Cornbates leucophaeus</i>	White-throated Treecreeper		U
<i>Myiagra inquieta</i>	Restless Flycatcher		V
<i>Petroica multicolor boodang</i>	Scarlet Robin (eastern sub-species)		U
<i>Phaps elegans</i>	Brush Bronzewing		U
<i>Sericornis frontalis</i>	White-browed Scrubwren		U
<i>Zoothera lunulata</i>	Bassian Thrush	R	V

* See Appendix for Conservation Status Codes

The dam and surrounding area is an aquatic/wetland environment that provides ideal habitat for a range of waterbirds including various duck species, White-faced Herons (*Egretta novaehollandiae*), cormorants (*Phalacrocorax* spp.) and the occasional Australian Pelican (*Pelecanus conspicillatus*).

Small numbers of Western Grey Kangaroos (*Macropus fuliginosus*) shelter in the park during the day and emerge to graze on neighbouring pastures in the evening and mornings. Common Ringtail Possums (*Pseudocheirus peregrinus*), Echidnas (*Tachyglossus aculeata*) and bat species are known to inhabit the park. There is also a possibility that Southern Brown Bandicoots (*Isodon obesulus*) are present, although no confirmed sightings have been made. Although an

Australian native species, the Koala (*Phascolarctos cinereus*) was introduced to the Mount Lofty Ranges and is now widespread across the region. Koalas are present at Totness Recreation Park and, while there are no plans to actively manage koalas within the park, their numbers and impacts should be monitored.

The park's native fauna has had to contend with habitat modification, introduced species, encroaching urbanisation and periodic bushfires. Although the park is one of the larger bushland remnants in the Mount Barker district, the freeway divides it into two discrete sections, which detracts from its value as habitat. Only small mammals or reptiles would be likely to use the stormwater pipe to move between the two sections. Crossing the freeway is hazardous and there have been reports of koalas killed on the roads in the vicinity of the park.

It is important that, where possible, connectivity is maintained to other vegetated areas to collectively form a wildlife corridor. By collaborating with the owners and managers of native vegetation on private land and with other agencies, the quality and extent of existing habitat in the district can be improved. Over time, the overall amount of habitat can even be increased to the long-term benefit of native wildlife. Park managers should endeavour to liaise with neighbours who have areas of native vegetation on their properties, so that management of bushland can be regionally integrated and the highest standards of care achieved.

On the park itself, little direct management effort can be focussed on native fauna until vegetated habitats are more secure and threats are abated. In the interim, surveys to identify and monitor native species should be encouraged. This is an area where volunteer input and involvement of tertiary institutions is particularly valuable.

Park managers and volunteer groups undertaking vegetation management need to remain cognisant of the habitat requirements of native fauna species and give due recognition to the fact that native birds and mammals may now be relying on introduced vegetation for protection. For example, Superb Blue Wrens (*Malurus cyaneus*) and other small bird species nest in the dense Blackberry thickets near the dam. This introduced habitat type is known to shelter Southern Brown Bandicoots in other Adelaide Hills parks. Thus, it is important to retain some cover until native plant species can be encouraged to regenerate and provide substitute habitat. Pest plant control programs may have to be staged and integrated with regeneration and revegetation activities, rather than progressed with whole-scale removal of large areas of introduced plants.

Objectives

Identify and protect native fauna inhabiting or using the park, particularly threatened species.

Design and implement revegetation and weed management in recognition of the habitat requirements of native wildlife, retaining some habitat while directing efforts at increasing the area of natural habitat and creating linkages to other remnants.

Strategies

- Take fauna habitat requirements into account, particularly for species such as the Southern Brown Bandicoot, Bassian Thrush and Superb Blue Wren, when planning and undertaking fire management, native vegetation rehabilitation, and introduced plant control programs.
- Encourage volunteer groups and others to conduct fauna surveys and undertake population monitoring. Investigate opportunistic sightings to verify species identification.

5.5 Introduced Plants

In previous years, Totness Recreation Park was disparagingly referred to as 'Gorse Park' and the past three decades have seen park managers making a determined effort to curb this menace. There has been some success, but Gorse (*Ulex europaea*) and other pest plants still pose a serious threat to biodiversity.

In total, 46 weed species have been recorded in the park, the majority located in the woodland areas. Gorse, Blackberry (*Rubus* sp.) and Bridal Creeper (*Asparagus asparagoides*) are listed as Weeds of National Significance, and are considered as South Australia's most threatening weeds in terms of their impact on the environment (Weeds Australia, URL). Within Totness Recreation Park, Gorse is certainly the most widespread. Although common, Blackberry (*Rubus* spp.), Dog Rose (*Rosa canina*) and African Daisy (*Senecio pterophorus*) are mainly confined to drainage lines and

an area around the dam where they form a dense thicket to the exclusion of virtually all other species.

Montpellier Broom (*Genista monspessulana*) is another prominent weed species in the park. In addition to the woody and herbaceous weeds, several species of exotic grasses are well established in the Blue Gum communities. Phalaris (*Phalaris* sp.) dominates much of the licensed area.

While presently of limited distribution, two South African pest plants are of particular concern because they are relatively new introductions that can spread rapidly. Pussy-tails (*Pentaschistis thunbergia*) and African Orchids (*Disa bracteata*) have been recorded in the park and are probably already beyond the stage where total eradication is feasible.

The serious extent of the environmental weed problem in Totness Recreation Park necessitates that a strategic approach is taken and priorities set in the vegetation management plan for weed control work conducted in the park. Action should continue to focus on those species that pose the greatest threat to biodiversity, concentrating on the priority areas indicated in the vegetation management plan. Focus should initially be on those sites of highest biodiversity value, particularly the Stringybark and Blue Gum areas, where reasonably intact native vegetation remains. In doing so, the area of weed-free native vegetation can be progressively expanded and then maintained with relatively little on-going effort.

With regard to the remaining Gorse, Blackberry and Dog Rose in the wetland area, care should be taken to ensure removal of large areas of introduced vegetation does not leave native animals without protective habitat (see Section 5.4 Native Fauna). A staged approach needs to be taken when removing the Gorse and Phalaris on the licensed area, so that it may be progressively revegetated with native species.

Wherever possible, pest plant removal should be followed up with habitat regeneration and revegetation activities. While spraying and slashing have been successful in reducing the significant infestation of Gorse in the northern section, weed control programs in high biodiversity areas should preferably employ minimal disturbance methods. The ideal situation would be to eliminate or prevent, where feasible, the further spread of exotic plants using methods that have minimal interference with native flora and fauna or impacts on other park values.

To effectively manage the threat of weed reintroduction, a regional integrated weed control program is required, involving DEH, the licensee, the owners and managers of surrounding properties, DC Mount Barker and the SA MDB NRM Board.

Objective

Control, and eradicate where possible, proclaimed pest plants and introduced plants posing the greatest threat to biodiversity within the park.

Strategies

- Prepare a vegetation management plan and include programs for coordinated pest plant control, land rehabilitation and revegetation with native species of local provenance.
- Remove weeds in high biodiversity areas, particularly Stringybark and Blue Gum communities, using minimal disturbance methods wherever possible.
- Consider fauna habitat requirements when planning and implementing any weed removal program.
- Continue to support and encourage partnerships with other agencies and authorities, the licensee, neighbours and volunteers, and contribute to integrated regional weed control programs.

5.6 Introduced Animals

Some of the introduced animals found throughout the Mount Lofty Ranges include the European Rabbit (*Oryctolagus cuniculus*), Brown Hare (*Lepus capensis*), House Mouse (*Mus musculus*), Black Rat (*Rattus rattus*), Red Fox (*Vulpes vulpes*) and Fallow Deer (*Dama dama*). Cats and dogs (probably domestic strays) and a number of introduced bird species are also common.

A number of the species referred to above have been seen in or near Totness Recreation Park. Introduced animals pose a serious threat to biodiversity and, unfortunately, so can the activities undertaken for their control. However, careful management, through integrated control programs, still remains the best way to ensure that pest animal numbers are reduced or eliminated, with minimal off-target impact on native flora and fauna.

Rabbits are present within the park and are currently regarded as probably the most serious problem. They impede the regeneration of native plants and destroy soil structure by burrowing and scratching, promoting weed invasion. Rabbit grazing can inhibit the re-establishment and recruitment of native plant species, further degrading the understorey habitat for small native mammals and birds.

Rabbits are susceptible to Rabbit Haemorrhagic Disease RHD (formerly Calicivirus) and Myxomatosis diseases, and can be controlled by careful application of 1080 and other poisons. However, baiting programs have the potential to adversely impact on native fauna. As part of any coordinated approach, off-target impacts need to be considered. Collaborating with regional authorities (particularly the SA MDB NRM Board) and neighbouring landowners to develop acceptable rabbit control programs (and other pest animal control) should remain on the management agenda. While broad-acre baiting programs are unlikely to prove feasible (given the park's proximity to residential properties) there may be opportunities to undertake some localised projects (eg poisoning, warren fumigation and destruction).

Predators such as foxes and cats have had a serious impact on native fauna but these animals also prey on introduced herbivores (eg Rabbits). On some other parks in the region fox baiting with 1080 poison in support of native Brown Bandicoot (*Isodon obesulus*) populations has been very successful in boosting bandicoot numbers. At this stage, there are no plans to implement fox and cat control measures at Totness Recreation Park, however that may change in the future. In all cases, liaison with neighbours would be a prerequisite for any control work on the park that involved laying poison baits.

Fallow Deer are known to have inhabited the park for many years and it is presumed that the original animals were either deliberate introductions or escapees from local deer farms. These animals contribute to grazing impacts, as well as damaging boundary fencing and causing trail compaction. Deer numbers should be monitored and, if found to be causing serious environmental impacts, steps should be taken to remove them in a humane manner. DEH will liaise with the SA MDB NRM Board to ensure the environmental impact caused by deer is addressed on a regional scale. It may also be worthwhile for park managers to talk with local deer farmers about the security of their stock.

Fallow Deer are also prone to many diseases, some of which can affect native animals. While it is important to address this issue, from a park management perspective, the environmental impacts caused by deer are a higher priority for DEH. Diseases in Fallow Deer, and their impacts on animals, are managed by Primary Industries and Resources SA.

Another introduced species is the Redfin Perch found in the dam. This fish is common throughout the Adelaide Hills and is a popular target species for anglers. Since the Big-headed Gudgeon was introduced in the 1980s there has been no monitoring or management of fish stocks, although anecdotal evidence suggests fish numbers are currently low. Despite this, fishers continue to visit the dam, so presumably Redfin Perch is still occasionally caught.

Research on the aquatic and wetland ecosystems should precede any further management intervention. Determining the current species composition and fish population levels in the dam would be a project that may interest a volunteer organisation or tertiary institution. How the fish stocks are managed in the future will need to be decided once the status of the dam population is better understood.

Objective

Monitor, control, and eradicate where possible, introduced animals within the park.

Strategies

- Monitor the extent of introduced animal populations and investigate their impacts on native flora and fauna and any future vegetation rehabilitation programs.
- If and when pest animal control proves necessary, work cooperatively with the licensee, adjoining landowners, relevant groups, volunteers and the local community, to achieve effective and acceptable results.
- In conjunction with the SA MDB NRM Board and neighbouring landowners, develop rabbit management programs that address rabbit control on a regional scale.
- Liaise with the SA MDB NRM Board regarding the regional management of environmental impacts caused by Fallow Deer.
- Encourage and support surveys of the fish population in the dam to guide future management.

6 MANAGING FIRE

Bushfires remain a concern to residents of the Mount Barker district, as in much of the Central Mount Lofty Ranges, where many people suffered substantial losses during the 1980 and 1983 Ash Wednesday events. As an area of natural vegetation, the park may be of concern to some members of the local community, who would like to see tangible evidence of fire prevention measures being implemented. Park managers are aware of these community concerns. Fire management activities take place in the park each year (eg grass slashing and access track maintenance). To date there has been no fuel reduction burning in Totness Recreation Park, although in recent years controlled burning has been undertaken in other parks in the region.

The South Eastern Freeway provides a partial barrier to the spread of fire throughout the whole park. Indeed, the 1983 Ash Wednesday bushfire only burnt the southern section. While that section of the park has recovered well, the adverse impacts on biodiversity of any future fires would be ameliorated by the restoration of other areas of native vegetation. Habitat corridors on the northern side of the freeway serve both as a refuge for native animals and as a gene pool for recolonisation.

While there are indications that visitors occasionally make campfires near the dam, this practice is neither sustainable nor desirable and the ban on campfires should be enforced.

A fire management plan will be prepared for the park, in consultation with local Country Fire Service (CFS) Groups and the District Bushfire Prevention Committee, to integrate district fire management. Neighbours, other stakeholders and the wider community should also be consulted to ensure an understanding of the fire risks and mitigating actions being proposed or undertaken in the park.

The fire management plan will:

- identify natural and cultural heritage values and built assets;
- provide a framework for the management of wildfire suppression, including identification of strategic access and control lines;
- provide a framework for prescribed burning for ecological management and fuel reduction purposes; and
- identify performance indicators.

The fire management plan should, to the fullest extent possible, take into account the environmental impact of proposed actions on the park's natural features and rare fauna dependent on such features, and should prescribe management actions to ameliorate those impacts.

Community understanding of the nature of fire hazard and how sensible planning can be complementary to the objectives of managing the park's flora and fauna should be fostered. Park managers should continue to maintain a cooperative and consultative relationship with the local community through liaison with the CFS, DC Mount Barker and other interested parties.

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

- Develop, review and implement fire management plans in association with CFS and other stakeholders.
- Continue to work with the relevant District Bushfire Prevention Committee, CFS and others to minimise risk to life and property within and surrounding the park.
- Suppress wildfire as soon as practicable, so as to minimise impacts on the vegetation's structural diversity, while also minimising the risk to neighbouring property and infrastructure.

7 MANAGING CULTURAL HERITAGE

7.1 Indigenous Heritage

Peramangk Culture and Heritage

The land comprising Totness Recreation Park was traditionally associated with the Peramangk people of the Mount Barker area (Tindale, 1974). For Aboriginal people, land and waters can have many interconnected complex meanings and values. The significance of land and waters is central to their lives: at birth, death, ceremonies and socially, whilst hunting, gathering, camping and travelling.

Relatively little is known about the Peramangk people, referred to as the Mount Barker Tribe in early references. Following colonial settlement, the Peramangk population was substantially reduced as a result of introduced diseases, dispersal, dispossession of their land and water supplies, and sometimes through violent conflict. It is not known if Aboriginal people retained any association with the Totness area in the post-colonial period.

Today, some of the descendants of the Peramangk people still live on their country and retain an interest in their culture and language. Some of the language and traditional stories have been recorded. However, due to historical or cultural reasons, any knowledge of the cultural heritage of the region may be privileged to selected people and therefore unable to be recorded. To date, the extent of Aboriginal heritage at Totness Recreation Park has not been researched, although the park is probably one of the few protected remnants of the cultural landscape of the Peramangk.

Given the lack of existing information, it is considered important that research be undertaken in order to gain a better understanding of the Aboriginal occupancy and use of the area. Park managers should consult with representatives of Peramangk (understood to be the Mannum Aboriginal Community Association) and other interested Aboriginal people who may have an interest in the park, and take whatever steps are necessary to facilitate their involvement with the park and this plan of management.

Aboriginal Heritage Act 1988

The purpose of the *Aboriginal Heritage Act 1988* is to protect and preserve Aboriginal sites, objects and remains. "Aboriginal site" and "Aboriginal object" are defined to mean an area of land or an object that is of significance according to Aboriginal tradition or 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 Totness Recreation Park and no sites are known to exist there, a comprehensive archaeological survey of the park is yet to be undertaken. Any Aboriginal sites, objects or remains that are identified in the future may require conservation plans to facilitate appropriate management.

To promote better cultural heritage management at Totness Recreation Park, research needs to be undertaken to identify and record Aboriginal sites, objects and remains in the park. To ensure the protection of Aboriginal sites, objects and remains, DEH staff should consult with AARD, the Mannum Aboriginal Community Association and other interested Aboriginal people before commencement of any significant 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 traditional owners in decisions regarding the management of Aboriginal heritage in Totness Recreation Park.
- 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, where appropriate, submit details of Aboriginal sites, objects and remains that relate to the park for inclusion on the AARD Central Archive.

7.2 Non-Indigenous Heritage

Totness Recreation Park does not have any sites recorded on state or local heritage registers. However, the dam in the northern section of Totness Recreation Park has links with the railway history of South Australia. Constructed in 1884, the South Australian Railways used this dam until 1944 to supply the steam locomotives travelling to and from Victor Harbor. Water was piped to an outlet at the Mount Barker Railway Station, approximately five kilometres away.

Subsequently, until the Mannum to Adelaide pipeline was completed in 1955, the dam served as a water source for Mount Barker Township. As a consequence, the Totness dam has connections with both railway history and regional community development, although all that remains today is the dam itself and some derelict pipeline infrastructure.

Totness also has historic associations with the wattle bark industry that flourished in the Mount Barker district during the late 1800s and early 1900s. The DC Mount Barker leased the catchment area around the Railway dam for contract harvesting of Golden Wattle bark. As was the case elsewhere in the Mount Lofty Ranges, Stringybark trees were cut for firewood. The Mount Barker Tannery utilised the wattle bark for tanning leather and the firewood was used in steam boilers and brick kilns. The wheat-field regeneration of Golden Wattles and the multi-stemmed, coppiced Stringybarks that can be seen in the park today are a visual reminder of this aspect of Mount Barker and the state's history.

A large part of the southern section of the park (former sections 3822 and 3824) was land originally granted to John Dunne in 1853. He was a significant figure in Mount Barker's early history but it appears that nothing tangible remains on the park from those former times. It is important nonetheless, that historical documentation continues for the park and as more information comes to light, any sites or objects of significance are protected. DEH should continue to support and encourage historic survey and research, as well as working with relevant authorities to undertake site stabilisation where required.

There may be merit in interpreting the interesting history of the railway dam. Appropriate signs and interpretation material could be provided for visitors to raise awareness of the cultural significance of this water-retaining structure.

Objective

Protect and conserve non-indigenous cultural heritage of significance within the park.

Strategies

- In cooperation with the Heritage Branch of DEH and other relevant authorities, support and encourage surveys and research into historic sites and stories that relate to the history of the park area. All sites should be recorded to the standards set by the Heritage Branch of DEH.
- Give consideration to interpreting heritage sites that highlight the park's history, particularly the former railway dam. Where appropriate, make this information available to visitors by providing and maintaining interpretive information. In so doing, liaise with relevant authorities, including the DC Mount Barker, railway and other historians and the Heritage Branch of DEH.

8 MANAGING TOURISM AND RECREATION

8.1 Visitor Use

Totness Recreation Park does not have a high public profile and the number of people visiting the park has been quite low. In the absence of any definitive visitor survey data, it is presumed that most come from the local area. While Totness is the only DEH reserve in the Mount Barker District that is (currently) dedicated for public recreation, DC Mount Barker manages a number of areas that are reserved for either conservation or recreation. The Laratinga Wetlands is a prime example of recreational opportunities in the Mount Barker District (see Figure 1). This artificial wetland, next to Martindale Reserve, provides a natural setting of wetlands, creeks and native vegetation with facilities including a carpark, barbeque and picnic area, and three walking trails of various distances, one of which utilises a boardwalk across the wetland.

Most activities enjoyed in Totness Recreation Park relate to its natural features. People use the park for walking, running, dog exercising and fishing. It is also likely that some visitors are interested in nature observation. A small amount of mountain bike riding, swimming and horse riding is also known to occur, however these activities will not be permitted. The only visitor 'facilities' are the dam in the northern section of the park and the informal system of tracks and trails, one of which incorporates the boardwalk.

While it has been recommended in this plan that Totness be reproclaimed a Conservation Park, it can continue to provide for some recreational opportunities for visitors. Visitors will be encouraged to use the park in a way that protects its values and helps to build understanding and respect for the need to protect such natural and cultural values. Recreational activities need to be environmentally sustainable and priority will be given to outdoor pursuits that facilitate understanding and enjoyment of the natural environment.

The park should cater for visitors interested in non-destructive physical activity or those with historical interests or seeking a deeper understanding of the area's ecology. It is not envisaged that the park will become a significant tourism attraction but opportunities may exist for small nature-based walking tours. The following paragraphs discuss various recreational activities in more detail.

Walking

The hilly aspect and variety of vegetation communities in Totness Recreation Park are such that walking is a very popular activity. Vehicle tracks follow the perimeter of the southern section and are also present in the northern section, providing visitors with wide, open areas to walk. The trails within the park are numerous, and are often narrow, windy and steep. The erodible nature of the soils and underlying geology, and the seasonally wet conditions experienced at Totness Recreation Park, may deem some trails inappropriate for use. Appropriate signage will be installed to inform visitors of which trails may be used. Walkers are required to remain on the tracks and trails, while staying off those closed to the public, to avoid disturbing the natural environment.

While not currently connected to any regional trail networks, should the opportunity arise that would also be acceptable, provided it could be done without compromising the integrity of the park.

Dogs

At present, dogs may accompany their owners in Totness Recreation Park and although the *National Parks and Wildlife (National Parks) Regulations 2001* requires they stay leashed at all times, casual observation shows that rule is often breached and dogs are being allowed to free range.

At Totness Recreation Park, biodiversity conservation is the primary objective of park management. Since dogs may negatively affect the natural values of the park, it is necessary to implement strategies to minimise these impacts, while still providing appropriate recreational opportunities. Although the native vegetation in the southern section of the park is more intact and of greater biodiversity value, restricting dog activities to the northern section would likely prevent many local people on the southern side of the freeway from recreating in the park, as they have in the past. The recreational opportunities provided in the past, and the desire for DEH to continue providing these opportunities to the local community, are such that dogs on leads will be permitted in both sections of Totness Recreation Park. It is imperative that dogs remain leashed at all times. Upon redesignation as a Conservation Park, the Director of National Parks and Wildlife will publish a

Notice in the *Gazette* to permit dogs on leads in accordance with the *National Parks and Wildlife (National Parks) Regulations 2001*.

Horses

No areas have been set aside in the park for recreational horse riding. Hence, an existing small amount of horse riding currently takes place illegally, mainly in the southern section of the park. DEH's procedure is to permit horse riding only in parks where it is deemed a sustainable activity. DEH does not believe horse riding is a sustainable activity at Totness Recreation Park. Hence, horses and horse riding will not be permitted within the park (except in the Licensed Zone; see Section 10.2 Leases and Licences). Appropriate signage will be installed at strategic locations within the park (particularly at park entrances) to inform visitors of permitted and prohibited activities.

Fishing

No information is available on the success or otherwise of those who attempt to catch fish in the dam. The fishing opportunities afforded by the dam are low-key and generally solitary. During some summers, the level of the dam can drop quite significantly, affecting opportunities for fishing.

As discussed elsewhere (see Section 5.6 Introduced Animals) a survey is needed to determine the status of the fish population and expert advice should be sought to ascertain whether management intervention is warranted. Should the status of the park change to Conservation Park, recreational (shore based) fishing will still be allowed, except in circumstances deemed inappropriate or unsafe by the park managers. Upon redesignation as a Conservation Park, the Director of National Parks and Wildlife will publish a Notice in the *Gazette* to permit fishing in accordance with the *National Parks and Wildlife (National Parks) Regulations 2001*.

Swimming

Despite a prohibition on this activity, people still swim in the dam from time to time. DEH does not have the resources to monitor and maintain this dam as a safe swimming location. Thus, swimming will not be permitted within the park.

Objective

Provide visitors with a range of recreational opportunities, without adversely impacting amenity values or on ecologically or culturally sensitive areas.

Strategies

- Permit visitor activities in accordance with the zoning of the park (Section 4 Zoning).
- Liaise with DC Mount Barker, other agencies and the community concerning recreational opportunities in the district, the future use and maintenance of walking trails, and recreational access.
- Install appropriate signage at strategic locations within the park to inform visitors of permitted and prohibited activities.

8.2 Visitor Access

Vehicle Access

No public vehicular access is allowed within the park itself. However, there are a number of gated entrances to the management access tracks that run around the boundaries and through the park, which can be used by the vehicles of park management staff, the licensee and in emergency situations (eg bushfire events) (see Figure 2).

There are two main entrances for visitors: one to the northern section (gate 1) at the end of Milne Road (off Mount Barker Road) and one to the southern section (gate 6) located on Paechtown Road/Haines Fire Track. The Milne Road entrance has a small space for car parking and a turn-around facility outside the park boundary, which is the responsibility of DC Mount Barker. The area provides adequate facilities when visitor numbers are low, however congestion is likely to occur when visitor numbers increase. The turn-around facility is compact, with tight corners and relatively steep slopes that can be very slippery when wet. DEH should liaise with DC Mount Barker regarding the turn-around situation.

Totness Recreation Park provides no car parking facilities at the southern entrance at gate 6 and cars cannot be safely parked along Paechtown Road/Haines Fire Track. Visitor numbers will be monitored at Totness Recreation Park and, if necessary to meet the requirements of visitor use, a small car parking area may be established at gate 6. Installation of such an area would require rationalisation of the fenceline and gate so as to provide appropriate off-road parking.

The other gates around the park are only used for management activities. Gate 3, adjacent to the freeway, requires the cooperation of Transport SA to improve access (for emergencies only).

Walking Trails

Pedestrians are free to traverse any of the management (vehicle) access tracks and walk along various trails in both the southern and northern sections of the park (see Figure 2). There are no visitor access trails provided to connect the northern and southern sections of Totness Recreation Park. A 1.5 metre wide x 100 metre long concrete storm water pipe passes under the freeway. People are known to use this pipe to traverse between the two sections, however the confined, dark conditions can be hazardous, particularly during winter. Appropriate signage will be installed to caution visitors of the risks faced when utilising the pipe.

Walkers can pose threats to biodiversity through damage to sensitive vegetation and soil surfaces. A lack of clearly designated routes that avoid sensitive areas (eg the marshy/wetland near the dam) was an issue that needed urgent attention and the boardwalk has been a successful solution. The boardwalk is currently in very good condition, with no signs that it will degrade in the near future. However, the dense blackberry thicket is encroaching on the boardwalk and will need to be cut back to ensure safe passage by visitors.

To ensure environmental impacts caused by visitors are minimised, particularly in the southern section, DEH will conduct a track assessment to determine which tracks are appropriate for use by the public. Those identified for use will be maintained as natural tracks, which should require minimal maintenance. Appropriate signage will be installed at strategic locations within the park to identify which trails are available for public use.

Objective

Provide visitors with appropriate access without compromising the park's natural values.

Strategies

- Liaise with DC Mount Barker regarding options for improving the Milne Road entrance, incorporating more adequate parking and turn-around facilities.
- Monitor visitor numbers and, if necessary to meet the requirements of visitor use, establish a small car parking area at the park's southern entrance (gate 6).
- Negotiate with Transport SA to provide better emergency access to gate 3 on the freeway for management and emergency vehicles.
- Install appropriate signage to caution visitors of the risks faced when utilising the storm water pipe as a traverse between the two sections.
- Monitor the condition of the boardwalk and manage encroaching blackberry thickets when necessary, to ensure safe passage by visitors.
- Undertake a track assessment in the southern section to identify appropriate trails for public use.
- Install appropriate signage at strategic locations within the park to identify which trails are available for public use.

8.3 Visitor Facilities

Currently, there are no facilities for visitors in Totness Recreation Park apart from the dam, management access tracks and walking trails. Camping is not permitted and there are no designated picnic sites, but people who recreate around the dam have created two bare soil patches on both the south and north sides that have become informal picnic areas.

Due to its small size, erodible soils and the perceived sensitivity of habitats, the park is probably unable to sustain more than low visitor rates. Priority is being given to outdoor recreation that promotes understanding and enjoyment of the natural and cultural environment. Visitors should

be encouraged to use the park with this in mind. At this time, it is not considered appropriate to provide any built visitor facilities in the park. However, as mentioned in Section 8.2 Visitor Access, if necessary to meet the requirements of visitor use, a small car parking area may be established at the park's southern entrance at gate 6.

Objective

Maintain the park for self-reliant visitors undertaking low-key activities.

Strategy

- Manage the park for self-reliant, low-key visitor activities without the requirement for the development of visitor facilities.

9 INVOLVING THE COMMUNITY

Friends and Volunteers

Volunteer support and community-based involvement that conserves biodiversity or cultural assets and establishes quality management of recreational use, has become an essential component of park management. Due to budget and staff limitations, DEH is only able to undertake a basic care and maintenance role for Totness Recreation Park and acknowledges the voluntary contribution made by the Friends of Totness. To date the Friends have been involved in weed control activities and the preparation of the initial draft of a management plan.

In the future, other voluntary community groups, tertiary institutions and schools could be encouraged to contribute on a voluntary basis to the management, development and interpretation of this park.

Regional Communities and Park Neighbours

DEH supports and promotes partnerships and cooperative management arrangements to achieve integrated natural resource management. This requires the development of effective working relationships with a range of government agencies, local authorities, non-government organisations and the local community.

The protection of Totness Recreation Park's biodiversity values requires the support of the local community. Linking both sections of the park to other remnant habitat is important for the long-term viability of native species of plants and animals, so the awareness and support of other landholders is essential for this to succeed. Partnerships should be developed that give a positive direction for the shared development and management of the park to fulfil the objectives of this plan. Moreover, with likely changes in landuse occurring within the region, it is important for DEH to actively work with DC Mount Barker and development bodies to ensure proposed developments do not adversely impact on biodiversity or park values.

With regard to Totness Recreation Park, achieving this means developing links with DC Mount Barker, SA MDB NRM Board, Bremer Barker Catchment Group, Adelaide Consultative Committee, Local Action Planning and Landcare groups, and park neighbours (among others).

Aboriginal Partnerships

DEH is committed to reconciliation and to the development of partnerships with Aboriginal people to ensure that Totness Recreation Park is managed in a way that respects contemporary and traditional culture, knowledge and skills. Partnerships can involve the delivery of programs that promote reconciliation, cultural awareness, indigenous employment and training, and indigenous cultural heritage management in parks.

Objective

Maintain cooperative working relationships for conservation outcomes.

Strategies

- Support and encourage the Friends of Totness (and other volunteers) to make a voluntary contribution to park management by developing annual works programs to achieve the objectives of the vegetation management plan.
- Encourage and facilitate the involvement of local schools and universities in research and volunteer programs.
- Encourage and contribute to the development of partnership arrangements with organisations that have an interest in contributing to the sustainable management of the park.
- Continue to work with DC Mount Barker (and others) to further explore the benefits of partnership arrangements to deal with issues of common interest.
- Take steps to involve representative Aboriginal traditional owners in decisions regarding the management of the park and in the preservation of Aboriginal heritage.

10 MANAGING RESERVE TENURE

10.1 Reserve Classification

In early 2006, the Minister for Environment and Conservation released a discussion paper on a review of the reserve classification system under the *National Parks and Wildlife Act 1972* (DEH, 2005). The discussion paper proposes a new category system for parks and reserves and management objectives for each category. Under the model being proposed, Totness Recreation Park would be reclassified as a Conservation Park. Redesignation into this category of reserve would be a public statement of its value to biodiversity conservation. Hence, it is the recommendation of this plan of management that Totness Recreation Park be reproclaimed as a Conservation Park.

Objective

Ensure the reserve classification properly reflects the management objectives of the land.

Strategy

- Reproclaim Totness Recreation Park as Totness Conservation Park.

10.2 Leases and Licences

A licence for grazing exists over a 5.8 hectare portion of the southern section of the park. The licensed area comprises a 1.2 hectare triangle of cleared land, dominated by Phalaris, plus an adjoining 4.6 hectares of remnant Blue Gum woodland whose understorey is also mainly Phalaris. Horses are depastured on the area.

Licensing reserve land to third parties is a strategy to ensure weed management and fire hazard reduction takes place, without taxing the resources of DEH. In this case, the licence conditions include a requirement on the part of the licensee to control weeds, specifically Gorse.

The licensing arrangement can continue during the term of this management plan, over that portion of the park designated as a Licensed Zone, subject to annual review. It is not envisaged that revegetation of the licensed area will commence within the term of this management plan.

Objective

Provide for licensed grazing in the Licensed Zone within the context of the park's vegetation management objectives.

Strategy

- Review annually, set licence conditions and monitor compliance, ensuring the licensee's operations are consistent with licence conditions and protecting park values and broader community interests.

SUMMARY OF MANAGEMENT STRATEGIES

STRATEGY
ZONING
<ul style="list-style-type: none"> Designate and adopt the management zones as shown in Figure 2 and apply the prescriptions as outlined in this plan.
MANAGING NATURAL HERITAGE
<p>Geology, Soils and Landform</p> <ul style="list-style-type: none"> Assess soil type and properties, including seasonal wetting or erosion potential, when planning access routes and when undertaking management activities. Identify any existing areas of erosion or disturbance and undertake remedial works. Avoid inappropriate development and control activities that may unduly erode soils. Ensure pest plant removal projects are staged and complemented by natural regeneration or revegetation to maintain soil stability. Maintain liaison and work cooperatively with the SA MDB NRM Board with regard to regional soil conservation measures.
<p>Hydrology</p> <ul style="list-style-type: none"> Encourage and support studies into the water quality of the dam and aquatic ecosystems to ensure habitat is conserved for native fauna. Liaise with the SA MDB NRM Board, Bremer Barker Catchment Group and other relevant authorities with regard to the broader catchment, groundwater and salinity management issues as they relate to Totness Recreation Park. Seek to further the objectives of the <i>River Murray Act 2003</i> when managing the park's hydrology.
<p>Native Vegetation</p> <ul style="list-style-type: none"> Prepare and implement a vegetation management plan that encourages natural regeneration, integrates introduced plant control programs with park management activities, and incorporates the licensed zone. Ensure native vegetation management and revegetation efforts are integrated on a regional basis. Support and encourage the Friends of Totness, other volunteer organisations and the licensee to undertake rehabilitation and monitoring programs in collaboration with DEH staff. Continue to promote awareness amongst DEH staff and the wider community of the potential for introduction and establishment of <i>Phytophthora</i>, the plant species susceptible to it and indicators of its presence. Ensure vehicles, equipment and footwear are clean prior to entering the park, and that all raw material, such as rubble, gravel, sand, soil and water, and all plants, brought into the park is free of <i>Phytophthora</i>. Continue to monitor the suspected infestation of <i>Phytophthora</i> in the park. If confirmed, implement programs to contain this pathogen and to restrict the movement of visitors and management staff through infected areas.
<p>Native Fauna</p> <ul style="list-style-type: none"> Take fauna habitat requirements into account, particularly for species such as the Southern Brown Bandicoot, Bassian Thrush and Superb Blue Wren, when planning and undertaking fire management, native vegetation rehabilitation, and introduced plant control programs. Encourage volunteer groups and others to conduct fauna surveys and undertake population monitoring. Investigate opportunistic sightings to verify species identification.

STRATEGY
<p>Introduced Plants</p> <ul style="list-style-type: none"> • Prepare a vegetation management plan and include programs for coordinated pest plant control, land rehabilitation and revegetation with native species of local provenance. • Remove weeds in high biodiversity areas, particularly Stringybark and Blue Gum communities, using minimal disturbance methods wherever possible. • Consider fauna habitat requirements when planning and implementing any weed removal program. • Continue to support and encourage partnerships with other agencies and authorities, the licensee, neighbours and volunteers, and contribute to integrated regional weed control programs.
<p>Introduced Animals</p> <ul style="list-style-type: none"> • Monitor the extent of introduced animal populations and investigate their impacts on native flora and fauna and any future vegetation rehabilitation programs. • If and when pest animal control proves necessary, work cooperatively with the licensee, adjoining landowners, relevant groups, volunteers and the local community, to achieve effective and acceptable results. • In conjunction with the SA MDB NRM Board and neighbouring landowners, develop rabbit management programs that address rabbit control on a regional scale. • Liaise with the SA MDB NRM Board regarding the regional management of environmental impacts caused by Fallow Deer. • Encourage and support surveys of the fish population in the dam to guide future management.
MANAGING FIRE
<ul style="list-style-type: none"> • Develop, review and implement fire management plans in association with CFS and other stakeholders. • Continue to work with the relevant District Bushfire Prevention Committee, CFS and others to minimise risk to life and property within and surrounding the park. • Suppress wildfire as soon as practicable, so as to minimise impacts on the vegetation's structural diversity, while also minimising the risk to neighbouring property and infrastructure.
MANAGING CULTURAL HERITAGE
<p>Indigenous Heritage</p> <ul style="list-style-type: none"> • Consult with the traditional owners in decisions regarding the management of Aboriginal heritage in Totness Recreation Park. • Identify and protect any Aboriginal sites, objects or remains in cooperation with the traditional owners, AARD and relevant authorities. • In consultation with the traditional owners, where appropriate, submit details of Aboriginal sites, objects and remains that relate to the park for inclusion on the AARD Central Archive.
<p>Non-Indigenous Heritage</p> <ul style="list-style-type: none"> • In cooperation with the Heritage Branch of DEH and other relevant authorities, support and encourage surveys and research into historic sites and stories that relate to the history of the park area. All sites should be recorded to the standards set by the Heritage Branch of DEH. • Give consideration to interpreting heritage sites that highlight the park's history, particularly the former railway dam. Where appropriate, make this information available to visitors by providing and maintaining interpretive information. In doing so, liaise with relevant authorities, including the DC Mount Barker, railway and other historians and the State Heritage Branch of DEH.

STRATEGY

MANAGING TOURISM AND RECREATION

Visitor Use

- Permit visitor activities in accordance with the zoning of the park (section 4 Zoning).
- Liaise with DC Mount Barker, other agencies and the community concerning recreational opportunities in the district, the future use and maintenance of walking trails, and recreational access.
- Install appropriate signage at strategic locations within the park to inform visitors of permitted and prohibited activities.

Visitor Access

- Liaise with DC Mount Barker regarding options for improving the Milne Road entrance, incorporating more adequate parking and turn-around facilities.
- Monitor visitor numbers and, if necessary to meet the requirements of visitor use, establish a small car parking area at the park's southern entrance (gate 6).
- Negotiate with Transport SA to provide better emergency access to gate 3 on the freeway for management and emergency vehicles.
- Install appropriate signage to caution visitors of the risks faced when utilising the storm water pipe as a traverse between the two sections.
- Monitor the condition of the boardwalk and manage encroaching blackberry thickets when necessary, to ensure safe passage by visitors.
- Undertake a track assessment in the southern section to identify appropriate trails for public use.
- Install appropriate signage at strategic locations within the park to identify which trails are available for public use.

Visitor Facilities

- Manage the park for self-reliant, low-key visitor activities without the requirement for the development of visitor facilities.

INVOLVING THE COMMUNITY

- Support and encourage the Friends of Totness (and other volunteers) to make a voluntary contribution to park management by developing annual works programs to achieve the objectives of the vegetation management plan.
- Encourage and facilitate the involvement of local schools and universities in research and volunteer programs.
- Encourage and contribute to the development of partnership arrangements with organisations that have an interest in contributing to the sustainable management of the park.
- Continue to work with DC Mount Barker (and others) to further explore the benefits of partnership arrangements to deal with issues of common interest.
- Take steps to involve representative Aboriginal traditional owners in decisions regarding the management of the park and in the preservation of Aboriginal heritage.

MANAGING RESERVE TENURE

Reserve Classification

- Reproclaim Totness Recreation Park as Totness Conservation Park.

Leases and Licences

- Review annually, set licence conditions and monitor compliance, ensuring the licensee's operations are consistent with licence conditions and protecting park values and broader community interests.

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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* (EPBC Act).

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

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

South Australian Conservation Status Codes

The following codes are based on the current listing of species under Schedules of the *National Parks and Wildlife Act 1972*, as amended in 2000. 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, PJ and Kraehenbuehl, DN (2001) *Plants of Particular Conservation Significance in South Australia's Agricultural Regions*.

Department for Environment and Heritage (undated) *Florlist*. Unpublished and regularly updated database.

The regions are as defined by the State Herbarium (Plant Biodiversity Centre), illustrated in the front cover of:

Barker, WR, Barker, RM, Jessop, JP and Vonow, HP (Eds) (2005) *Census of South Australian Vascular Plants. Fifth Edition. J. Adelaide Bot. Gard. Supplement 1*. Botanic Gardens of Adelaide and State Herbarium, Adelaide.

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.