

Hallett Cove and Marino Conservation Parks

(including Sandison Reserve)



Management Plan 2010

Department
for Environment
and Heritage



Government
of South Australia

FOREWORD

Hallett Cove and Marino Conservation Parks are located on the southern Adelaide metropolitan coastline and provide beautiful vistas over Gulf St Vincent.

These parks protect areas of remnant coastal vegetation in an otherwise urbanised environment. They are loved by the local community and are significant to the Kaurna people. The important Tjilbruke Dreaming passes through the area and large numbers of Aboriginal artefacts have been recorded in the parks.

Hallett Cove Conservation Park is known internationally for its outstanding geological features that provide evidence of glaciation over 280 million years ago. The park is a popular destination for walkers and is linked with the City of Marion coastal walking trail that continues north through Sandison Reserve and offers stunning views of the Adelaide coastline.

The Friends of Hallett Cove Group have worked tirelessly to re-vegetate the park, which has benefited enormously from their efforts.

Marino Conservation Park is located around two kilometres north of Hallett Cove adjacent to the prominent Marino Rocks Lighthouse. The park is a popular area for the local community and is enjoyed by regular visitors.

I would like to thank the Community Reference Group and Friends of Parks Groups who gave their time in developing this Management Plan. Their interest and passion for these parks will ensure they are cared for well into the future.

And I commend the plan's arrangements to maintain and improve visitor facilities and to manage the impact of recreational activities on the sensitive coastal environment in these parks.

I formally adopt the plan of management for Hallett Cove and Marino Conservation Parks under the provisions of section 38 of the *National Parks and Wildlife Act 1972*.

Jay Weatherill

HON JAY WEATHERILL MP

MINISTER FOR ENVIRONMENT AND CONSERVATION



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SUPPLEMENTARY INFORMATION

Definitions of conservation ratings assigned to native plant and animal species throughout this management plan are available at, and can be downloaded from <http://www.environment.sa.gov.au/parks/management/plans.html>. In addition, a supplementary document has been prepared for this management plan that includes species lists and background information about the geology of Hallett Cove and Marino Conservation Parks, which can be found at <http://www.environment.sa.gov.au/parks/management/plans.html>.

ACKNOWLEDGEMENTS

The local community is gratefully acknowledged for the input and involvement in the planning process, particularly the Friends of Hallett Cove Conservation Park and Friends of Marino Conservation Park and members of the community who provided submissions and or attended the open community meeting. The assistance of the City of Marion, Department for Planning and Local Government and National Trust of South Australia is also appreciated.

1 PARK LOCATION AND FEATURES

Hallett Cove Conservation Park was proclaimed on 1 July 1976 under the *National Parks and Wildlife Act 1972* for the protection of its outstanding geological features, which had been recommended for protection by geologists, conservationists and the local community. Two parcels of land have been added to the park since 1976, with the area of the park now totalling 49.6 hectares. The park comprises land parcels Section 1550, and Allotments 20 and 21 of Filed Plan 28675, all within the Hundred of Noarlunga.

Marino Conservation Park was proclaimed on 2 November 1989 to protect an area of remnant coastal vegetation, including one of the southernmost occurrences of Elegant Wattle (*Acacia victoriae* ssp. *victoriae*). The 29.9 hectare park comprises land parcel Allotment 7 of Deposited Plan 27270, within the Hundred of Noarlunga.

The parks are less than two kilometres apart and provide important coastal refuge for native fauna in an otherwise urbanised environment. The parks are positioned on rising ground overlooking Gulf St Vincent on the southern Adelaide metropolitan coastline, within the City of Marion local government area. The parks are part of the Metropolitan Open Space System and are core areas in the proposed Great Southern Urban Forest (Department for Planning and Local Government), Department for Environment and Heritage (DEH) and City of Marion, 2005; Figure 1).

Hallett Cove Conservation Park is unique in that it is a relatively small area that includes a diverse range of significant geological formations. Sandison Reserve is adjacent to the western side of the park and also protects geological formations of significance. It has been a National Trust reserve since 1965 (purchased from the trustees of the late George Sandison; Figure 2) and is managed by DEH in conjunction with Hallett Cove Conservation Park through a partnership with the National Trust. The park and reserve are within a State Heritage Place under the *Heritage Places Act 1993*, owing to the outstanding evidence of glaciation during the Permian (280 million years ago). Forty-six of the native plants recorded in Hallett Cove Conservation Park are of regional significance and eight have a conservation status in South Australia. The vegetation in the park is a refuge to native fauna such as the Nankeen Kestrel (*Falco cenchroides*) and Singing Honeyeater (*Lichenostomus virescens*).

Marino Conservation Park protects recovering native habitat, including coastal heath and open woodland communities on relatively steep hillsides. There are 10 plant species of state significance and 51 of conservation significance in the region. Of the native bird and reptile species that have been recorded in the park, the rare Peregrine Falcon (*Falco peregrinus*) is of State and regional conservation significance.

The parks are located in an area of significance to Kaurna people. The discovery of a large number of stone implements made by Aboriginal people prior to the last glacial maximum (20,000 years ago) within and near Hallett Cove Conservation Park is a significant aspect of the park's cultural heritage (Cooper, 1958).

The parks provide for low impact recreation enjoyment in a natural setting. Visitors can walk along trails that provide them with the opportunity to see significant geological features, fragile coastal vegetation, and coastal scenery.

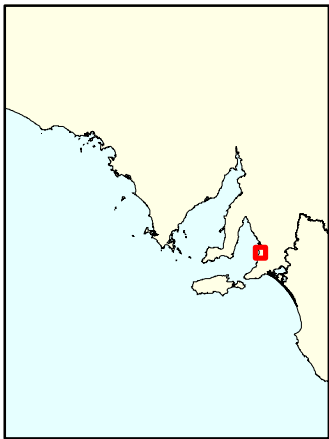
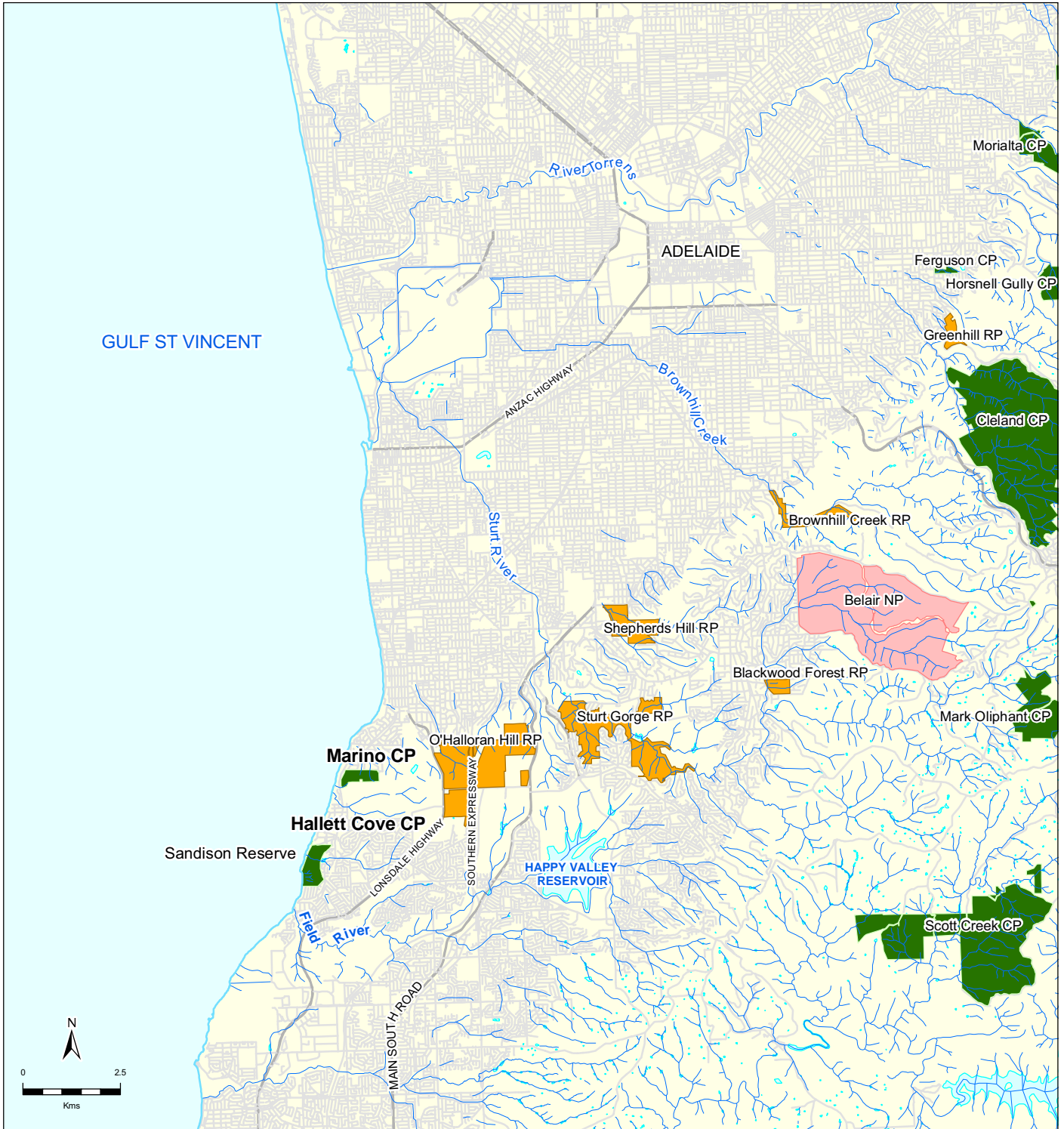


Figure 1
Hallett Cove and Marino Conservation Parks

Location

Legend

- Highway
- Road
- Watercourse
- Conservation Parks
- National Parks
- Recreation Parks
- Sandison Reserve
- Dam/Reservoir

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2 LEGISLATIVE FRAMEWORK

2.1 National Parks and Wildlife Act 1972

Reserves are managed by the Director of National Parks and Wildlife subject to any direction by the Minister for Environment and Conservation or the Chief Executive of the Department for Environment and Heritage (DEH). When managing reserves, the Director is required under section 37 of the *National Parks and Wildlife Act 1972* to have regard to, and provide actions that are consistent with the following objectives of management stated in the Act:

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

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

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 (e.g. staffing and funding).

2.2 Native Title Act 1993

Native Title describes the rights and interests, which Aboriginal and Torres Strait Islander People have in land and waters according to their traditional laws and customs. 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 actions that might affect native title, DEH will follow the relevant provisions of the *Native Title Act 1993*.

3 VISION

Hallett Cove and Marino Conservation Parks conserve remnant and re-established native coastal habitat in an otherwise urbanised area, and protect internationally significant geological formations. The parks will continue to provide for educational and sustainable visitor experiences in a natural setting and will be vital links in the chain of remnant habitat.

3.1 Key Values

- State Heritage listed and internationally recognised Permian glacial pavements and other significant geological formations.
- Remnant coastal habitat that provides for native bird, reptile and butterfly species in an urbanised environment. One of the southernmost occurrences of Elegant Wattle (*Acacia victoriae* ssp. *victoriae*) is protected in Marino Conservation Park and this is of particular significance.
- The educational visitor experience provided by the geological and biological features of the parks.

3.2 Key Threats

- Inappropriate visitor use that results in the loss of native habitat, erosion or damage to significant geological features and landforms.
- Introduced animal and plant species, particularly declared plant species and garden escapes, which compete with native plants.

3.3 Key Management Strategies

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

- **Geology, Soils and Landforms:** Protect the geological formations of significance in Hallett Cove Conservation Park and Sandison Reserve from erosion or damage by visitors.
- **Native Vegetation:** Support and encourage the Friends groups and other volunteers to continue revegetation and restoration programs, and assist with monitoring species of conservation significance in collaboration with DEH.
- **Managing Tourism and Recreation:** Encourage sustainable visitor experiences by maintaining walking trails, addressing causes of erosion where practical and educating people about the importance of remaining on the trails provided. In particular, undertake trails planning for Hallett Cove Conservation Park.
- **Involving the Community:** Work in partnership with volunteers such as the Friends of Hallett Cove Conservation Park and the Friends of Marino Conservation Park, to undertake conservation management and community education, while providing advice and support as needed.

4 MANAGING GEOLOGY AND HYDROLOGY

4.1 Geology, Soils and Landforms

Hallett Cove and Marino Conservation Parks are located in a landscape characterised by ridges and hills with steep slopes on sediments (Laut et al., 1977). According to Taylor et al. (1974), the overall geology of this area is characterised by sedimentary formations of the Proterozoic, Permian, Pliocene and Pleistocene (see Supplementary Document).

Geology of Hallett Cove Conservation Park and Sandison Reserve

The geological formations found at Hallett Cove Conservation Park tell a story that begins approximately 636 million years ago during the Proterozoic Eon, with five different geological periods represented in the park and four gaps in the geological record as evidenced by unconformities in the stratigraphy.

Hallett Cove Conservation Park and Sandison Reserve are within a State Heritage Place (Figure 2) because of the outstanding evidence of glaciation during the Permian (280 million years ago), which has international significance. The park also encompasses the Hallett Cove Geological Monument and protects significant geological features that are subjects of research, education and community interest. The key geological features of the park and Sandison Reserve are described below. To ensure the integrity of the significant geology, any materials that could confuse the geological interpretation of the natural stratigraphy should not be used for the construction of park infrastructure. For similar reasons, any necessary earth works should also ensure that the integrity of significant geological features is maintained.

Black Cliff and Shore Platform

The Black Cliff, the cliff line to its north and the shore platform below are composed of late Proterozoic sedimentary rocks which were deposited sometime between 636 – 590 million years ago (Figure 2). Extreme pressures moulded the rock into complicated fold patterns (Cooper et al., 1972). The top of the Black Cliff is the crest of a large fold, eroded and planed off by an ice sheet during the Permian, which resulted in the glaciated pavement that was discovered by Professor Ralph Tate in 1875 (Giesecke, 1999). The smooth siltstone pavement resulted from rock flour frozen in the ice sheet polishing the rock as it moved and the striations were caused by larger rocks (Cooper et al., 1972; Giesecke, 1999). The glacial pavement at the top of Black Cliff is protected by wooden railing to minimise any disturbance from visitors and ensure that people can observe the glacial pavement, cliff face and shore platform while remaining at a safe distance from the cliff edge.

Erratics

There are a number of large quartzite and granite boulders known as 'erratics' located in the park. These rocks were transported to the area by an ice sheet during the Permian and subsequently deposited when the ice sheet melted. One of the large erratics on the beach is a boulder of dark-coloured Sturt Tillite from the Sturtian ice age (approximately 750 million years ago).

Amphitheatre and Sugarloaf

The Amphitheatre and Sugarloaf formations present in Hallett Cove Conservation Park are of great interest and display three layers of Permian, Pliocene and Pleistocene sediments (Figure 2). The landforms of the Amphitheatre and Sugarloaf, and their associated gullies, were created over the last 6,000 years (approximately) through deep erosion from creeks and wind erosion. As these formations are highly susceptible to erosion there are designated paths and boardwalks that allow visitors to observe these unique formations without increasing that erosion.

Waterfall Creek

The hillside and rock outcrops exposed along the bank and hillside of Waterfall Creek, from the waterfalls down to the coast, provide the best visible summary of Hallett Cove's geology (Giesecke, 1999; Figure 2). The five periods of deposition and the four gaps in the geological record are all displayed as a result of erosion.

Erosion is the main concern for Waterfall Creek, particularly near the vehicle bridge which connects the north and south sections of the park (Figure 2). An assessment of the erosion occurring in the park should be undertaken, especially with regards to Waterfall Creek, and erosion controls put in place. This assessment should be undertaken in conjunction with the City of Marion and the Adelaide and Mount Lofty Ranges Natural Resources Management (AMLR NRM) Board, to address causes of erosion from outside the park.

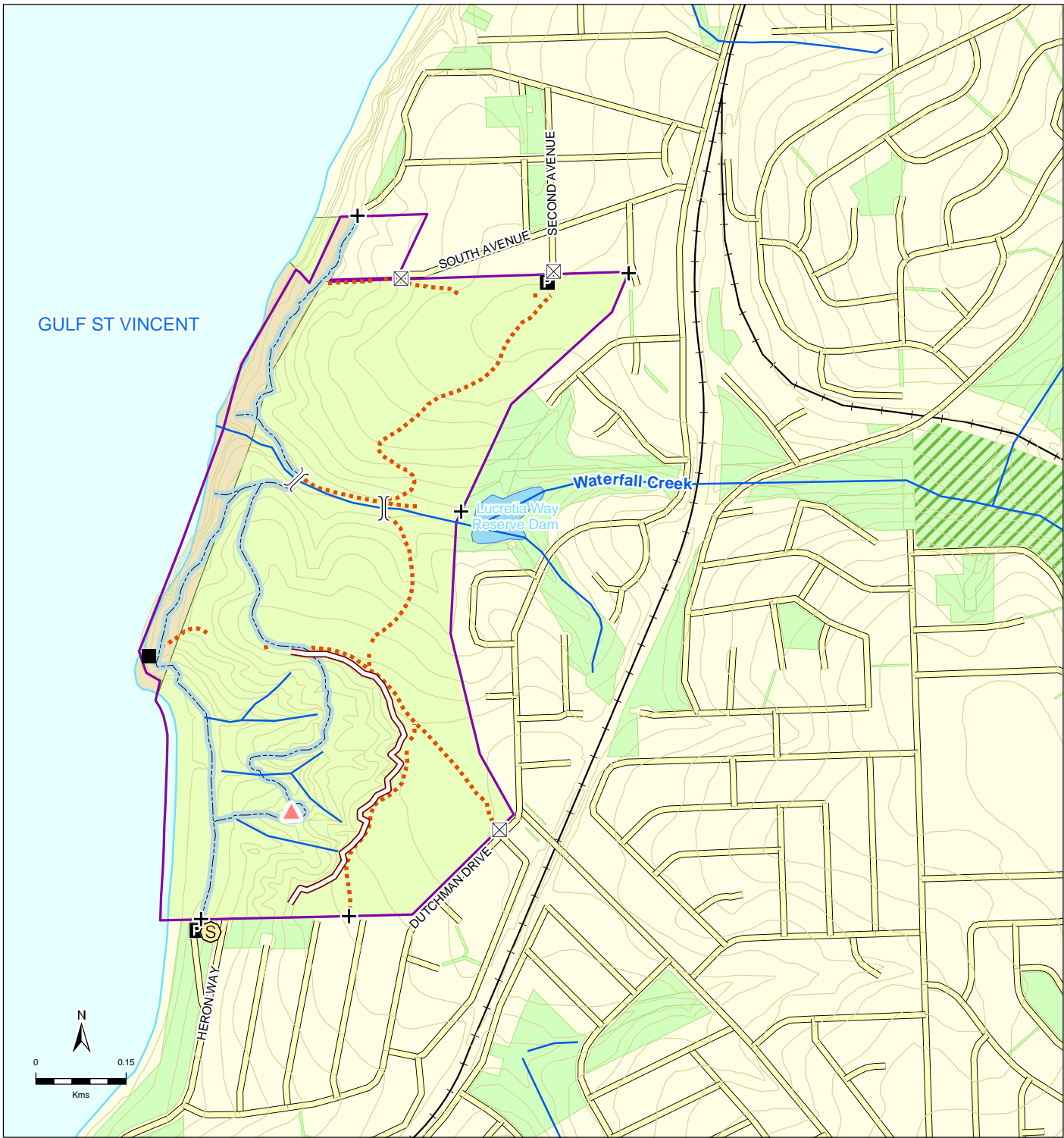


Figure 2
Hallett Cove Conservation Park

Features

Legend

- | | | |
|----------------------------------|------------------|--------------------------|
| Hallett Cove Conservation Park | Glacier Hike | Black Cliff |
| Sandison Reserve | Walking Trail | Sugarloaf |
| City of Marion Reserves/Property | Creek/Flowline | Pedestrian Gate |
| Glade Crescent Reserve | The Amphitheatre | Car Park |
| Dam | Contours | Gate |
| State Heritage Place | Roads | Former Hallett Cove SLSC |
| | Railways | |

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Geology of Marino Conservation Park

The land comprising Marino Conservation Park is underlain by a succession of stratigraphic layers that generally dip steeply to the west and can be seen in the gullies and on the central track between the car park and Marino Rocks Lighthouse (Randell, 1998; Figure 3). Broad geological mapping and the formations evident along the nearby coastline indicate that the park is underlain by slate, shales or sandstone formed from the sedimentation that occurred in the Adelaide Geosyncline, and are of the Proterozoic Umberatana Group. These rocks were folded approximately 500 million years ago, similar to those found at Hallett Cove Conservation Park.

Soils of Hallett Cove and Marino Conservation Parks

The soils found in the parks are classified as brown solonized soils, which are alkaline and often contain significant amounts of soluble salts (Taylor et al., 1974; Drexel and Preiss, 1995). There are also skeletal soils in Marino Conservation Park, which are very shallow soils developed from older rocks such as slates, shales and quartzites that are prone to erosion (Taylor et al., 1974). The soils of Hallett Cove Conservation Park are of glacial and alluvial deposits, primarily clayey and silty sands within the vicinity of Waterfall Creek and clay and sandy silt deposits, overlying calcareous clays to the south of the limestone hill face to the south of the creek (Kinnaird Hill deRohan and Young Pty Ltd, 1975).

The sandy dunes above the Hallett Cove beach are contaminated with asbestos, due to the shacks that used to be on the foreshore prior to the early 1970s. Work should be undertaken to manage this contamination as required, ensuring that erosion and any damage to the natural values of the park are kept to a minimum.

Closed Landfill Site in Marino Conservation Park

There is a closed waste disposal site in the eastern section of Marino Conservation Park (Figure 3). This land was added to the park in 1989, when the City of Marion agreed to transfer the land. The City of Marion has been undertaking gas and leachate monitoring of the old landfill site since 2003. Monitoring has been undertaken as per advice from environmental consultants, generally once a year and across different months to account for seasonal variations. DEH will facilitate Council's continuation of this monitoring based on recommendations from environmental consultants, to ensure that any potential risks to site users and adjoining land owners are identified and managed.

Objective

Protect the landforms, geology and soils of the parks, particularly key geological features.

Strategies

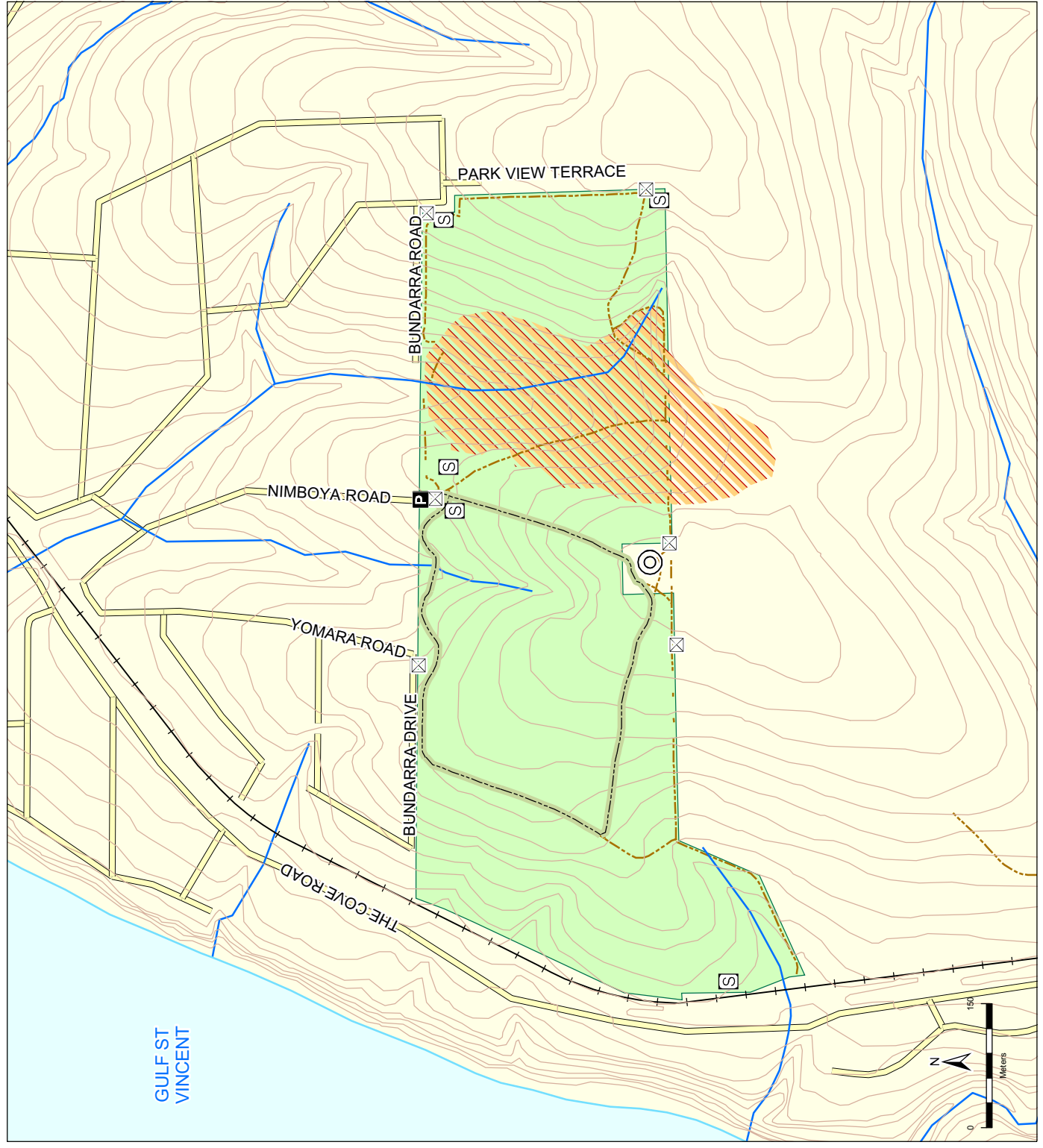
- In conjunction with the City of Marion and the AMLR NRM Board, assess, monitor and control the erosion of soils in the parks, particularly soils within the vicinity of Waterfall Creek in Hallett Cove Conservation Park.
- Protect the geological formations of significance in Hallett Cove Conservation Park and Sandison Reserve from erosion or damage by visitors.
- Ensure management activities consider impacts to geologically significant sites and restrict the materials used in Hallett Cove Conservation Park and Sandison Reserve to ensure that the geological integrity of these sites is not compromised.
- Manage asbestos that may pose a health risk from Hallett Cove Conservation Park.
- Work in partnership with the City of Marion regarding further monitoring or remediation of the old landfill site in Marino Conservation Park as required.

Figure 3

**Marino Conservation Park
Features**

Legend

- Marino Conservation Park
- Closed Landfill
- Contours
- Watercourse/Flowline
- Railways
- Botanical Trail (coincides with some tracks)
- Roads
- Tracks/Trails
- ◎ Marino Rocks Lighthouse
- S Sign
- ⊠ Gate/Entrance
- P Car Park



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4.2 Hydrology

Waterfall Creek is the only watercourse that flows through Hallett Cove Conservation Park and provides important riparian habitat in the park for native birds and reptiles. The creek is fed by a natural spring and run-off from a 370 hectare catchment area. The run-off is likely to contain pollutants such as litter, organic matter, nutrients (from fertiliser), pesticides and particulate matter (Kinnaird Hill deRohan and Young Pty Ltd, 1975). These pollutants impact on the riparian environment through altering the characteristics of the water and widening the creek channel by encouraging growth of vegetation in the creek bed. In conjunction with the Adelaide and Mount Lofty Ranges Natural Resources Management (AMLR NRM) Board this should be monitored and the riparian habitat restored where possible. Water quality analysis at different locations along the creek has been undertaken by volunteers, working in association with the AMLR NRM Board. Analysis of the creek in and near the park should continue to be encouraged as the data can be useful for identifying the need for pollutant mitigation measures within the wider catchment.

Waterfall Creek is dammed in Lucretia Way Reserve (owned by City of Marion) adjacent to the eastern boundary of Hallett Cove Conservation Park, which reduces the volume of water flowing in to the park and negatively impacts on the riparian habitat (Figure 2). There are plans to construct an artificial wetland in the Glade Crescent Reserve (owned by City of Marion) further upstream of the park, to better utilise this public space as an area for sustainable recreation, while providing wetland habitat and improving water quality. Increased urban runoff throughout the Waterfall Creek catchment has led to a change in the pre-European water regime of Waterfall Creek. The development of the Glade Crescent Reserve wetland will lead to some changes to this current water regime. The City of Marion has committed to working with DEH, AMLR NRM Board and local community during the design and construction phases to ensure that an environmentally, culturally and socially sustainable approach is taken. The timing and rate of flow and water quality should be monitored and altered where possible to ensure that appropriate water supply is reaching the riparian habitat. This should be undertaken through liaison with the City of Marion, AMLR NRM Board and any volunteer organisations interested in the hydrology of the park.

There is the risk of pathogenic bacteria, faecal coliforms and nutrients being introduced to Waterfall Creek via accidental sewage discharge from a sewage pumping station upstream of the park. SA Water will respond to any accidental discharges in accordance with the overflow abatement plan and contain any sewage overflow if possible to minimise the environmental and public health risks (EPA, 2003).

Objective

Influence management of hydrological regimes to ensure the maximum benefit to Hallett Cove Conservation Park.

Strategies

- Liaise with the City of Marion during design and construction of the Glade Crescent Reserve wetland.
- Encourage water flow and quality monitoring along Waterfall Creek in liaison with the AMLR NRM Board and any interested volunteer organisations, to better inform water management within the wider Waterfall Creek catchment.

5 MANAGING BIODIVERSITY

Hallett Cove and Marino Conservation Parks are adjacent to urban areas along the southern metropolitan coastline. The parks are located within the core area of the proposed Great Southern Urban Forest (Department for Planning and Local Government), DEH and City of Marion, 2005). DEH will work with the agencies and organisations involved in the proposal to protect the biodiversity of the parks as part of this project.

While the specific impacts that climate change will have on these two parks within the life of this management plan are uncertain, it has been identified that the native ecosystems they protect are particularly vulnerable to climate change (Bardsley, 2006). Given the location of the parks, some of the species, communities and ecosystems adapted to this type of environment will have difficulty in migrating and adapting along climatic and geographical gradients (Bardsley, 2006).

5.1 Native Vegetation

Vegetation management plans will be developed for each park in partnership with stakeholders and volunteers to provide directions for the rehabilitation and management of native vegetation. The plans will address the main threats to native vegetation, including competition from introduced plant species, erosion, and the probability that inappropriate recreation activities could have negative impacts. The plans should also consider any possible fire hazards and the continued survival of plant and fauna species of conservation significance.

Hallett Cove Conservation Park

The vegetation of Hallett Cove Conservation Park is characterised by coastal heath, low shrubland and native grassland habitats. There are two major pockets of remnant vegetation associations, including a Kangaroo Thorn (*Acacia paradoxa*) thicket in the northern section of the park, and coastal heath on the northern slopes of the Amphitheatre and Waterfall Creek. These are important examples of the original vegetation cover of the southern Adelaide metropolitan coastline. In particular, the sheltered gullies and slopes of the Amphitheatre support a high level of biodiversity (Kraehenbuehl, 1996), which includes:

- a taller shrub layer (up to two metres high) of Quandong (*Santalum acuminatum*), Wreath Wattle (*Acacia acinacea*), Cup Wattle (*Acacia cupularis*), Daisy-bush (*Olearia* sp.) and Dryland Tea-tree (*Melaleuca lanceolata*);
- a dense concentration of low compact shrubs such as Dwarf Hakea (*Hakea rugosa*), Common Eutaxia (*Eutaxia microphylla*), Spiny Wattle (*Acacia spinescens*) and Sword-sedge/Rapier-sedge (*Lepidosperma* sp.); and
- smaller understorey shrubs and herbs including Scarlet Runner (*Kennedia prostrata*), Flax Lily (*Dianella* sp.) and Annual Rock-fern (*Cheilanthes austrotenuifolia*).

The vegetation in Hallett Cove Conservation Park has been highly modified since the early 1920s, primarily due to agricultural practices and the construction of shacks formerly situated along the foreshore. Vegetation surveys undertaken since the 1990s identified that there are 160 native plant species present in the park. Eight species are of State significance and 46 are significant within the region (Table 1 of the Supplementary Document).

Since the park was proclaimed, revegetation programs have been undertaken and are continuing in association with the Friends of Hallett Cove Conservation Park. It is important to re-assess the current status of the native vegetation communities. For example, it has been suggested that a number of native species planted within the previously cleared area are not locally indigenous species. These include Coastal White Mallee (*Eucalyptus diversifolia*) and Peppermint Box (*Eucalyptus odorata*). Revegetation efforts are being undertaken and should be continued to re-establish former indigenous plant communities that included species such as Mallee Box (*Eucalyptus porosa*) and Dryland Tea-tree (Kraehenbuehl, 1996).

Marino Conservation Park

The predominant vegetation communities of Marino Conservation Park are coastal heath and open woodland (Kraehenbuehl, 1996; Randell, 1998). Historically, the vegetation would have been Mallee Box and Drooping Sheoak (*Allocasuarina verticillata*) low woodland (DEP, 1992; Kraehenbuehl, 1996). Most of Marino Conservation Park was cleared for agricultural practices and a number of introduced plant species became established (Section 5.3 Introduced Plants and Animals).

Since the park was proclaimed, work has been undertaken by DEH and the Friends of Marino Conservation Park to rehabilitate the native vegetation of the park. This work has included the propagation and re-introduction of locally indigenous plants and the removal of introduced species. The number of woody weeds has been greatly reduced and there are now more than 150 native plant species that have been recorded in the park, a large number of which have a conservation status (Table 2 of the Supplementary Document). The restoration of native vegetation in Marino Conservation Park should continue, however, it must be noted that some of the older revegetation sites have been recognised as being too dense and could pose a fire hazard. Therefore vegetation communities in the park need to be assessed to inform future management of the park's native vegetation.

The regionally vulnerable Elegant Wattle (*Acacia victoriae* ssp. *victoriae*) trees in Marino Conservation Park are of significance because they are some of the only remaining specimens south of Adelaide, (DEP, 1992; Randell, 1998). Eight orchid species have been recorded in the park, including the State vulnerable Behr's Cowslip Orchid (*Diuris behrii*) and regionally vulnerable Little Donkey-orchid (*Diuris palustris*). Natural processes such as poor grass seasons, coupled with disturbance regimes, are essential for the continuance of most native orchid species (Bates, 2007). The coastal heath vegetation does not recover from certain disturbance regimes and this must be considered. Recovery of orchid species will be addressed in the vegetation management plan.

If further remediation of the closed landfill site is required or recommended by an environmental consultant, this may result in rehabilitation of the site, in which case revegetation should be considered. The type of vegetation community and species that would be appropriate on the site can be addressed in the vegetation management plan.

Objective

Protect and enhance indigenous vegetation, particularly species of conservation significance.

Strategies

- Work with City of Marion, AMLR NRM Board and Department of Planning and Local Government to ensure connectivity of the parks to regional biodiversity corridors e.g. the Great Southern Urban Forest.
- Undertake surveys of the native plant species found in Hallett Cove Conservation Park and assess vegetation communities in Marino Conservation Park. Include Sandison Reserve in any assessments or projects undertaken in Hallett Cove Conservation Park.
- Prepare and implement a vegetation management plan for each park in partnership with key stakeholders and volunteers.
- Support and encourage the Friends groups and other volunteers to continue revegetation and restoration programs, and assist with monitoring species of conservation significance in collaboration with DEH.

5.2 Native Fauna

The Hallett Cove and Marino Conservation Parks provide refuge for a variety of bird, reptile and invertebrate species. Unfortunately, locally indigenous native mammal species have disappeared from the parks and surrounding area. Lists of native fauna found in the parks are provided in the Supplementary Document to this management plan.

Birds

The parks support various native bird species including some of regional conservation significance (Tables 3 and 4 in the Supplementary Document), such as the Little Wattlebird (*Anthochaera chrysoptera*) and the Spotted Pardalote (*Pardalotus punctatus punctatus*), which were recorded in Hallett Cove Conservation Park. The Peregrine Falcon (*Falco peregrinus*), which is considered rare in South Australia, was recorded in Marino Conservation Park. The threats to bird species in both parks include competition for habitat and food with introduced animal species, unnatural predators such as cats, dogs and foxes, as well as loss of habitat. The provision of the habitat necessary to support the native bird species that frequent the parks and those that may return should be taken into consideration when preparing the vegetation management plans (Section 5.1 Native Vegetation). To assist with this, more bird surveys should be undertaken in conjunction with the surveys and assessments of native vegetation found in the parks. Monitoring of bird species in the parks should be encouraged to assess the success of any habitat rehabilitation.

Reptiles

While there have been no surveys of reptile species in Marino Conservation Park, surveys of Hallett Cove Conservation Park recorded the Dwarf Skink (*Menetia greyii*), Bougainville's Skink (*Lerista bougainvillii*) and Sleepy Lizard (*Tiliqua rugosa*). General observations indicate that the number of reptiles in Hallett Cove Conservation Park is declining. The key threats to native reptiles include predation by introduced animals and habitat loss; these should be mitigated where possible.

Invertebrates

Surveys of Hallett Cove and Marino Conservation Parks in 1996 indicated that the Black and White Sedge-Skipper (*Antipodia atralba*) was present in the Black Grass Saw-sedge (*Gahnia lanigera*) habitat of both parks (Grund, 1997). Other butterfly species that are more common were also found in both of the parks during surveys in 1996 (Grund, 1997; Grund, 2007). While coastal habitat can often be harsh due to salt-laden winds, many butterfly species can still flourish. The survey of butterfly species should be encouraged in the parks as they can be a good indicator of ecosystem health (CSIRO, 2005; Grund, 2007).

It is also of interest that surveys of ants in Marino Conservation Park have been undertaken by the South Australian Museum in conjunction with members of the Friends of Marino Conservation Park. Through this work a new species of ant, *Camponotus fraseri*, was identified.

Objective

Ensure the protection of native fauna species in the parks.

Strategies

- Undertake native fauna surveys for each park and Sandison Reserve that assess bird and reptile species. Encourage monitoring to assess the success of habitat rehabilitation and to inform the mitigation of key threats.
- Facilitate the regeneration of habitat that supports native fauna species, particularly those of conservation significance, and consider this in the development of vegetation management plans.

5.3 Introduced Plants and Animals

Prior land use and the surrounding urban setting have resulted in introduced species being a key threat to the parks. Control of introduced species needs to be undertaken at a landscape scale, in conjunction with the AMLR NRM Board, the City of Marion and nearby landowners, particularly pastoral properties and areas identified as part of the Great Southern Urban Forest proposal (Department for Planning and Local Government, DEH and City of Marion, 2005).

There have been 95 introduced plant species recorded in Hallett Cove Conservation Park and 77 recorded in Marino Conservation Park. Of these, 16 are declared under the *Natural Resources Management Act 2004* (Tables 5 and 6 of Supplementary Document). Declared weed species are a priority when planning weed control programs and in the development of the vegetation management plans (Section 5.1 Native Vegetation). Bridal Creeper (*Asparagus asparagoides*) and Boneseed (*Chrysanthemoides monillifera*) are two of the 20 weeds of national significance (DEWHA, 2007) and each have national strategic plans that should be referred to when addressing the control of these species. Olive (*Olea europaea*) trees have been successfully controlled in both parks, but there is concern due to the olive trees growing on nearby properties from which seeds are easily spread. DEH, the AMLR NRM Board and the City of Marion, should liaise with relevant landowners to encourage the control of these species.

The introduced plant species that are the most problematic include Pincushion (*Scabiosa atropurpurea*), Ribwort (*Plantago lanceolata* var. *lanceolata*), Soursob (*Oxalis pes-caprae*), Gazania (*Gazania linearis*), Bearded Oat (*Avena barbata*), Wall Barley-grass (*Hordeum leporinum*), and Skeleton Weed (*Chondrilla juncea*). Park managers need to be aware of the highly invasive nature of these species and undertake control measures where necessary. The threat of garden escapes is an issue for both parks. DEH will work with the AMLR NRM Board and the City of Marion to educate neighbours and park visitors about the threat that introduced species in gardens can pose to the biodiversity of the parks.

Populations of introduced animals do not naturally decline because they have few natural predators or fatal diseases, and in some cases they have high reproduction rates. Many destroy native habitat, prey on native animals and compete for food and shelter. Predators such as the Red Fox (*Vulpes vulpes*), Domestic Cat (*Felis catus*) (feral and stray cats), as well as stray dogs, can

be found in the parks, all of which pose serious threats to indigenous birds and reptiles. The Brown Hare (*Lepus capensis*), which has been observed in Marino Conservation Park, prevents plant regeneration and competes with native fauna for food and habitat. Nine introduced bird species have been observed in the parks (Table 7 of Supplementary Document). The Common White Snail (*Certhia virgata*) consumes native species such as Saltbush (*Atriplex* sp.) and is present in large numbers in Hallett Cove Conservation Park. Control of introduced predator species could assist in increasing the population of lizards in the park, which in turn would assist in the eradication of these snails.

Control of introduced species needs to be addressed through integrated control programs in conjunction with the AMLR NRM Board, City of Marion and nearby landowners to ensure that numbers are reduced with minimal impact on native species. Given the urban setting, the methods that can be used for introduced animal control programs are restricted, due to the risk to domestic animals. Therefore, introduced animal control will focus on species that present obvious management issues which can be undertaken using methods that do not harm domestic animals or impact on park neighbours or visitors.

Objective

Minimise the impact of introduced plants and animals on the remnant habitat and species in Hallett Cove and Marino Conservation Parks.

Strategy

- Plan and implement integrated introduced plant and animal control programs for the parks in cooperation with the AMLR NRM Board, the City of Marion and local property owners. Support the education of the local community about the threat of introduced species as part of these programs. Undertake the planning necessary for the control of introduced plants within the parks through the respective vegetation management plans.

6 MANAGING FIRE

There has been a low level of bushfire incidents for both parks. Eight fires have been recorded in Hallett Cove Conservation Park since 1975, most of which are attributed to human causes, aside from a fire that burned 0.5 hectares in 1986 due to a lightning strike. Large bushfires have not been recorded for Marino Conservation Park since 1975, however the most recent bushfire took place in 1999 and burnt grassy woodland vegetation in the south-east of the park.

As these parks are surrounded by residential areas, DEH has a responsibility to provide for effective control if fire threatens surrounding landowners. The vegetation, level of recreational use and relatively small size of the parks are also important for consideration in regard to fire management.

To address fire management for Hallett Cove and Marino Conservation Parks, DEH prepared the *Reserves of the Southern Foothills, Mount Lofty Ranges Fire Management Plan (2009)* (including Hallett Cove Conservation Park, Sandison Reserve and Marino Conservation Park), in consultation with the Metropolitan Fire Service (MFS) and Country Fire Service (CFS), to integrate district fire management.

The fire management plan:

- identifies fire related risk to natural and cultural heritage values and built assets;
- defines objectives for fire management in the planning area;
- identifies strategies to achieve these objectives incorporating:
 - a framework for the management of bushfire suppression, including identification of strategic fire access and infrastructure; and
 - a framework for prescribed burning to assist in built asset protection and for ecological management purposes.

The fire management plan identified that there is a risk that Hallett Cove and Marino Conservation Parks could burn in a single fire event due to their small size and exclusion from the Mount Lofty Ranges Primary Response Zone for aerial suppression. Therefore, bushfire suppression will aim to reduce the likelihood of this occurring and will also aim to minimise the risk of bushfire impacting on life, property and environmental values. Fire management works within the parks will primarily focus on track and fire-break maintenance, and strategic fuel reduction. Within Hallett Cove Conservation Park efforts will be taken to ensure that the geological sites are not disturbed by vehicles or earthworks when undertaking fire management activities (DEH, 2009). Prescribed burning for ecological management may be undertaken if necessary (DEH, 2009). The influence that fire may have on coastal heath vegetation and the proliferation of weed species that may occur in these areas following a fire must be considered prior to any prescribed burning.

Objective

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

Strategies

- Review and implement the *Reserves of the Southern Foothills, Mount Lofty Ranges Fire Management Plan (2009)* in association with the MFS, CFS and other stakeholders.
- Work with the fire management agencies to minimise risk to life and property within and surrounding the parks.

7 MANAGING CULTURAL HERITAGE

7.1 Aboriginal Heritage

Today, Kurna people live on their country and practice their culture and language. While some research has been undertaken about the Aboriginal heritage at Hallett Cove Conservation Park, more comprehensive research could be undertaken in the park and for Marino Conservation Park. Due to historical or cultural reasons, any knowledge of the cultural heritage of the region may be privileged to selected Kurna people and therefore unable to be recorded. It is considered important that further research be undertaken in order to gain a better understanding of the Aboriginal occupancy and use of the area. The spring that feeds Waterfall Creek within Hallett Cove Conservation Park is of spiritual significance to Kurna people, through the connection this place has with the Tjilbruke Dreaming. These places are linked to Warriparinga and other sites on the Dreaming Track along the south coast and in the Fleurieu Peninsula. Most Kurna people regard the Tjilbruke Dreaming, and the sites associated with it, as one of the most important elements of their cultural heritage and identity.

Artefacts of the Pleistocene

Large stone implements made by Aboriginal people approximately 20,000 years ago were discovered at Hallett Cove in 1934 by H.M. Cooper (Cooper, 1958; Cooper et al., 1972; DEP, 1986). Over a thirty year period, more than 1,700 artifacts were discovered and are now stored in the South Australian Museum (DEP, 1986). Most of the important sites are believed to be within the park. For example, stone implements were found in the sandy soils along the rim of the Amphitheatre (Cooper et al., 1972).

Aboriginal Heritage Act 1988

There are no sites listed on the Central Archive for either park. It is suggested that the site within Hallett Cove Conservation Park identified by Cooper (1958) be assessed for inclusion on the Central Archive. It is likely that other sites of significance exist in the park, with reports of siliceous stone implements and food remains found near the Waterfall Creek outlet (DEP, 1986). When carrying out management activities in the parks, DEH will ensure that it complies with the *Aboriginal Heritage Act 1988*.

Objective

Ensure that any Aboriginal sites, objects and remains are protected and preserved.

Strategy

- Consult with the relevant regional Aboriginal heritage committees and relevant Government Aboriginal heritage authorities in decisions regarding the protection of Aboriginal heritage.
- Support more comprehensive cultural heritage surveys within the parks in consultation with the Kurna Heritage Board dependent on funding availability.

7.2 Non-Aboriginal Heritage

Hallett Cove Conservation Park is a State Heritage Area under the *Heritage Places Act 1993* due to the international significance of the geological features it protects. The only ruins in Hallett Cove Conservation Park indicative of European occupation are stone walls of a cottage located in the north-eastern area of the park. No such ruins have been found in Marino Conservation Park, however both parks were used for pastoral and cultivation practices from the mid 1850's. While it is excluded from Marino Conservation Park, the Marino Rocks Lighthouse is of historical interest (Figure 3). The 15 metre high lighthouse was established in 1962 to replace lighthouses that had been destroyed (Randell, 1998; State Library of South Australia, 2008).

A partial skeleton of a Diprotodon and a partial paw of a giant kangaroo, were discovered on the north bank of the Field River, south of Hallett Cove Conservation Park (Giesecke, 1999). The remains are approximately 42-70,000 years old (Pledge, et al., 2002). If any such remains are found in either park they must be protected in accordance with advice from relevant authorities.

Objective

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

Strategies

- Protect any sites or items of non-Aboriginal heritage significance discovered in the future.
- Ensure that any megafauna remains found in either park are appropriately protected.

8 MANAGING TOURISM AND RECREATION

8.1 Visitor Access and Activities

The many unique geological formations of Hallett Cove Conservation Park attract a number of visitors to the parks, including school and university groups, as well as tourists from interstate and overseas. Marino Conservation Park is primarily enjoyed by members of the local community.

Hallett Cove Conservation Park can be accessed from nine different entrances (including via the beach); the southern entrance off Heron Way is the most popular (Figure 2). Based on two years of data obtained from a counter at the most popular entrance to Hallett Cove Conservation Park, it is estimated that 20 - 30,000 people visit the park per year, with the warmer months appearing to be a more popular time to visit. Marino Conservation Park can be accessed from four entrances, with the main entrance from Nimboya Road, where there is a car park. City of Marion maintains public toilet facilities at Surfers Café (the former Hallett Cove Surf Lifesaving Club) and at Marino Rocks Café. Both of these sites are adjacent to the parks.

The features of the parks make them ideal for short day visits for walking. Camping and the use of fire or cooking facilities are not permitted. Car parking facilities need to be rationalised and in some instances closure may be necessary. For example, the car park at Marino Conservation Park will be closed as it has been used for illegal camping and antisocial activities, has low usage by park visitors and the amount of available parking along Nimboya Road is considered adequate. The locked gate to the park will be moved to the Nimboya Road side of the car park and the remediated area will be made available for parking to key interest groups such as Friends of Marino Conservation Park Group. Antisocial behaviour also occurs at Hallett Cove Conservation Park, generally after dark. Currently, this behaviour is being discouraged through the car park at the Heron Way entrance being closed overnight.

While other parks in the area, such as O'Halloran Hill Recreation Park provide for bicycle and horse riding, the visitor infrastructure of Hallett Cove and Marino Conservation Park is not suitable for these activities. Therefore bicycle and horse riding are not permitted in the parks and this will be communicated effectively to the public.

People should only access the parks via designated access points. Some of the property owners who share a boundary of Hallett Cove Conservation Park have been observed to access the park from their backyards via gates. This activity will be discouraged as it threatens native vegetation, as people are not entering the park via the trails provided and at times their pets access the park via these gates as well. Liaison and education of the local community regarding the damage caused by this is needed. The fences of both parks will be maintained and updated where necessary by DEH to address specific park management purposes; otherwise the cost of fencing is the responsibility of the adjacent landowner as per the *Fences Act 1975*.

Walking Trails

All walking trails in the parks should be maintained and erosion prevention work undertaken where practical. Walking trails are provided throughout Hallett Cove and Marino Conservation Parks that enable visitors to view geological features, rehabilitated vegetation and coastal scenery, and to decrease the impact that visitors can have on the parks' biological and geological values.

The most popular trails in Hallett Cove Conservation Park are all part of the Glacier Hike (Figure 2). This trail continues through Sandison Reserve and connects with the City of Marion's coastal walking trail, which is part of a regional trail network within the 'Coast Park'. Coast Park is a State Government initiative to develop a coastal linear park that stretches from Sellicks Beach to North Haven. In Marino Conservation Park the most popular walking trail is the Botanical Trail (Figure 3). Section 9.2 details the redesign of an eroded track in Marino Conservation Park running between Nimboya Road to the Marino Rocks Lighthouse.

Rationalisation of all trails in the Hallett Cove Conservation Park is needed as some are poorly aligned and there is a need to better cater for larger student and tourist groups. This will be undertaken via a Trails Concept Plan and Trails Master Plan. The redevelopment and upgrade of trails to enhance the experience of visitors in the park is a priority.

Exercising Dogs

The impact of dog-walking on the natural values of Hallett Cove and Marino Conservation Parks has been assessed in the preparation of this plan. Dogs will continue to be permitted in Marino

Conservation Park when on-lead and on trails identified by signage as being suitable for this activity. There is anecdotal evidence that suggests native vegetation has been degraded by dogs walking along the Botanical Trail in Marino Conservation Park. If the impacts of this activity do become unsustainable as assessed by DEH then the continuation of this activity in some or all locations will be reviewed and a revised Director's notice issued.

Dog-walking is not considered to be a suitable activity in Hallett Cove Conservation Park and is therefore not permitted in this park. Prevention of this activity assists in the protection of fragile landforms and native fauna such as bird and reptile species. For example, permitting dog-walking in native habitat has been found to significantly reduce the diversity and abundance of bird species (Banks and Bryant, 2007). There are more than ten parks or public areas within close proximity of Hallett Cove Conservation Park where dogs can be exercised. One of these areas is adjacent to the south of the park and connects to the beach that is adjacent to part of the western boundary of the park. Clear signs and indicators are needed to ensure that people are aware that they can not bring their dogs into the park from this area (Section 8.2 Information and Interpretation).

Model Gliders

A number of different locations are used throughout Hallett Cove Conservation Park for flying model gliders. This activity by the members of model gliding clubs and other individuals has led to people walking off of the trails provided and at times placing themselves at risk. This activity is also having an impact on the natural values of the park. All model glider pilots will be required to have gained a set level of accreditation as determined by the Director of National Parks and Wildlife, and to hold, or be a member of a club that provides public liability insurance coverage, before being allowed to fly in Hallett Cove Conservation Park.

Objective

Provide an enjoyable and educational experience to visitors, while maintaining integrity of the natural and cultural values of the parks.

Strategies

- Undertake rationalisation of all car parking facilities, including closure of the car park in Marino Conservation Park to the general public.
- Encourage visitor experiences by maintaining and redeveloping walking trails, addressing causes of erosion where practical and educating people about the importance of remaining on the trails provided. In particular, undertake trails planning for Hallett Cove Conservation Park.
- DEH to work with City of Marion to ensure connectivity of trails within the parks to those outside the parks
- Continue to permit dogs on-lead on some of the walking trails within Marino Conservation Park subject to on-going assessment by DEH and maintain prohibition on dogs in Hallett Cove Conservation Park.
- Control the use of model gliders in Hallett Cove Conservation Park by imposing requirements upon pilots set by the Director of National Parks and Wildlife.

8.2 Information and Interpretation

Interpretation signs and signs indicating permitted park activities are visible throughout Hallett Cove Conservation Park and are located at the entrances to Marino Conservation Park. The signs in Hallett Cove Conservation Park are currently adequate for conveying key points of interest and facilitate the park's educational role. Signs indicating appropriate park activities may require review to ensure clear communication of the activities supported by the parks and any review of interpretation signs should endeavour to rationalise the reason for restrictions on some activities.

Objective

Enhance visitor experience of the parks while ensuring park values are protected.

Strategy

- Ensure adequate signs are in the parks and Sandison Reserve to communicate information about the parks, while educating the public about appropriate activities.

9 MANAGING RESERVE TENURE

9.1 Additional Land

There are three parcels of land (Section 1577 Hundred Noarlunga, and Allotments 1 and 2 in DP 2387) to be added to Hallett Cove Conservation Park (Figure 2). These parcels are also within the State Heritage Place boundary.

Sandison Reserve, adjacent to Hallett Cove Conservation Park, is owned by the National Trust of South Australia. The long-term partnership between the Trust and DEH has involved the reserve being effectively managed by DEH as part of Hallett Cove Conservation Park. DEH has discussed the possibility of adding Sandison Reserve to the park with the Trust. Further discussions with the National Trust of South Australia should occur regarding the future management of the reserve and to determine the appropriate tenure that best protects the Sandison Reserve area.

9.2 Public Utilities

While there are no public utilities located in either Hallett Cove or Marino Conservation Parks, the Marino Rocks Lighthouse is enclosed on three sides by Marino Conservation Park (Figure 3). The lighthouse and the small area of land around it are owned by the Australian Maritime Safety Authority (AMSA). The track that leads from Nimboya Road to the lighthouse is on an AMSA easement to allow access for maintenance (Figure 3). Telecommunication equipment has been installed on the lighthouse and the easement is being used to provide access for maintenance of this infrastructure as well.

It is proposed that the track on the easement be closed due to it being highly eroded and poorly positioned (this would also result in the realignment of the Botanical Trail). It is proposed that the lighthouse be accessed via the track that heads in a south-east direction from the car park and then connects with the southern boundary track, and that these should be upgraded to provide access throughout the year. The closure of the track going between Nimboya Road and Marino Rocks Lighthouse will be negotiated with AMSA. DEH also needs to liaise with AMSA and telecommunication companies to ensure that their operations minimise the impact on park values.

Any future proposals for public utilities will be assessed on a case by case basis against the principles of this plan.

Objectives

Minimise the impact of authorised users on Marino Conservation Park.

Strategies

- Add Section 1577 Hundred of Noarlunga, and Allotments 1 and 2 in DP 2387 to Hallett Cove Conservation Park.
- Continue discussions with the National Trust of South Australia regarding the future management and tenure of Sandison Reserve.
- Liaise with AMSA to propose the closure of the easement and the use of the south-eastern track that connects with the southern boundary track in Marino Conservation Park.
- Communicate appropriate guidelines that AMSA and telecommunication companies should follow when utilising tracks in the park to ensure they have a minimal impact on the values of Marino Conservation Park.

10 INVOLVING THE COMMUNITY

DEH will continue to support volunteers to undertake activities that assist us to care for natural and cultural heritage. It is important for DEH to continue communication with all volunteers working with DEH, including the provision of appropriate guidance and advice. When developing subordinate plans (e.g. fire management planning) DEH will consult with volunteers and key community stakeholders.

DEH acknowledges and values the contributions of volunteers such as the Friends of Hallett Cove Conservation Park (FHCCP) and the Friends of Marino Conservation Park (FMCP). The FHCCP have contributed to the rehabilitation of the park since 1987. The group have planted more than 10,000 native plants and removed invasive woody weeds and garden escapes. Revegetation and weed removal are both ongoing activities for this friends group (FHCCP, 2007b). At times the FHCCP have also undertaken anti-graffiti work. The FMCP regularly assist with tasks such as seed collection, removal of introduced plants, and propagation and planting of locally indigenous plants (Randell, 1998). For example, in 1994 only 10 individual Mallee Box (*Eucalyptus porosa*) remained in the park and many seedlings of this species have since been planted (Randell, 1998). Members of the FMCP have also undertaken surveys of plants and animals in the park.

Educating the local community about the significant geological, biological and cultural values protected by the parks is important to foster a greater understanding about the role the parks play in environmental conservation. Therefore, the continued use of the parks by university and school groups will continue to be encouraged and DEH will support the FHCCP and FMCP in their efforts to communicate the values of the parks to the public.

Communication with neighbours of the parks is needed to ensure that rubbish dumping (including soil and garden clippings) and the pruning or removal of native trees 'to improve the view' does not occur in either park. These types of activities are illegal and the local community should be educated about the adverse impacts and the penalties of such activities.

To facilitate DEH's involvement in landscape natural resources management and provide a positive direction for the shared management of the parks, DEH will develop and maintain ongoing partnerships and cooperative management arrangements with the City of Marion; the Adelaide and Mount Lofty Ranges Natural Resources Management (AMLR NRM) Board; Kurna Peoples native title claimants; representative Kurna Heritage Committee(s); National Trust of South Australia; key community stakeholders; and local community members (especially park neighbours).

Objective

Develop and maintain partnerships with volunteers, the local community and organisations with an interest in the parks.

Strategies

- Work in partnership with volunteers such as the Friends of Hallett Cove Conservation Park and the Friends of Marino Conservation Park, to undertake conservation management and community education, while providing advice and support as needed.
- Educate the community to foster a greater understanding of how the parks contribute to environmental conservation, prevent the illegal dumping of rubbish, and stop removal or damage of native vegetation.
- Form and maintain partnerships to facilitate the implementation of landscape scale conservation programs and address issues of common interest, especially with the City of Marion and the AMLR NRM Board.

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