

PARA WIRRA RECREATION PARK MANAGEMENT PLAN

Central Region

SOUTH AUSTRALIA



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

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FOREWORD

This document is one of a series of management plans for South Australia's reserves to be adopted under the provisions of the National Parks and Wildlife Act, 1972.

Para Wirra Recreation Park was set aside as a reserve in 1962 to provide for the anticipated demand for recreation areas flowing from the rapidly expanding population of the northern suburbs. The results of a visitor survey conducted in 1989/90 (Suter, 1990) confirm that Para Wirra remains an important recreation resource for the residents of the northern suburbs.

As well as providing a natural bush setting for a barbecue or game of tennis, the 1409 ha park links with surrounding bushland to form the third largest block of native vegetation in the Mt. Lofty Ranges. As 74% of the native vegetation that once covered the Mt. Lofty Ranges has been cleared since the 1940's, the regional conservation significance of Para Wirra Recreation Park is high.

Management of the reserve must therefore be directed to protecting its conservation values and at the same time provide for a range of recreation activities that are consistent with management objectives.

The management plan was released in draft form for public comment in January 1992, resulting in nine (9) written submissions from interested individuals and organisations. All comments received have been considered in preparing the plan for adoption and serve to highlight the importance of public participation in the planning process.

Following consideration of the public comments and advice from the Reserves Advisory Committee, the plan is now formally adopted under Section 38 of the National Parks and Wildlife Act, 1972 as the Plan of Management for Para Wirra Recreation Park.

It should be noted that in November 1992 the National Parks and Wildlife Service was amalgamated with the Department of Lands to create the new Department of Environment and Land Management. References to the National Parks and Wildlife Service in this document should now be taken as referring to the Department of Environment and Land Management.

KYM MAYES MP
MINISTER OF ENVIRONMENT AND LAND MANAGEMENT

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THE PLANNING PROCESS

The National Parks and Wildlife Act 1972 provides the authority by which the Minister for Environment and Land Management controls and manages all reserves in South Australia which are proclaimed under the Act.

Section 38 of the Act states that plans of management are required for all reserves. Plans should include proposals for the management and improvement of reserves and indicate the means by which relevant objectives of the Act are to be achieved.

Section 37 lists ten objectives which the Minister, Chief Executive Officer and Director "shall have regard to" in managing reserves:

1. The preservation and management of wildlife.
2. The preservation of historic sites, objects and structures of historic or scientific interest within reserves.
3. The preservation of features of geographical, natural or scenic interest.
4. The destruction of dangerous weeds and the eradication or control of noxious weeds and exotic plants.
5. The control of vermin and exotic animals.
6. The control and eradication of disease of animals and vegetation.
7. The prevention and suppression of bushfires and other hazards.
8. The encouragement of public use and enjoyment of reserves and education in, and a proper understanding and recognition of their purpose and significance.
9. In relation to managing a regional reserve - to permit the utilization of natural resources while conserving wildlife and the natural or historic features of the land.
10. Generally the promotion of the public interest.

These objectives form the foundation for all management plans and have been duly considered where relevant, in preparing this Management Plan for Para Wirra Recreation Park.

Upon completion of a draft plan, it must be announced in the Government Gazette and placed on public exhibition for at least two months. During this period, interested persons may make submissions on the plan. The plan, with all such submissions, is then referred to the Reserves Advisory Committee (an independent review body) who make further comments or suggestions.

The Minister, after considering all representations, may then adopt the plan of management with or without any alterations. Notice of such official adoption is published in the Government Gazette and copies of the plan are made available to the public.

A similar process applies for any amendment proposed to a plan of management. Once a plan is adopted, its provisions must be carried out in relation to the reserve in question and no operations may be undertaken unless they are in accordance with the plan.

This plan is intended to "set the scene" as it were, for the management of the park for the next five to ten years. For that reason it is generally couched in broad, conceptual terms rather than addressing specific issues in minute detail.

PURPOSE OF THE PLAN

This plan outlines the more significant recreational, natural and cultural values of Para Wirra Recreation Park. It includes a philosophy of management, lists a series of management objectives and describes how these might be achieved. Proposed management actions to implement selected strategies are listed at the end of the plan.

The reserve is seen as an area in close proximity to the northern Adelaide metropolitan area, protecting a significant remnant of the indigenous vegetation of the northern Mt. Lofty Ranges where a range of compatible recreational activities may take place in a natural environment.

PARK DESCRIPTION

Location and Size

Para Wirra Recreation Park is located approximately 40 km north east of Adelaide in the northern Mt. Lofty Ranges. The suburbs of Elizabeth and Salisbury are to the west, Gawler and the Barossa Valley to the north and Golden Grove to the south.

The total area of the park is 1409 hectares and comprises Sections 178-185, 199, 217, 237-238, 299 and 311 Hd. of Barossa and Sections 423 and 428-29 Hd. of Para Wirra.

Para Wirra forms part of a larger 2,573 ha block of contiguous native vegetation, the remainder of which is managed by the Woods and Forest Department, the Engineering and Water Supply Department and private land holders.

Figure 1 shows the location of the park in relation to the northern metropolitan area and the City of Adelaide. The boundaries and cadastral composition of the reserve are shown in Figure 2.

History

The reserve takes its name from what are believed to be local Aboriginal words, "Para" meaning river and "Wirra" meaning forest.

The first 654 hectare block of Para Wirra was purchased from Mr. L. Rasheed in 1960 and was gazetted a national park in 1962. Para Wirra National Park was officially opened by the then Premier of South Australia, Sir Thomas Playford, on the 24th September 1963. Para Wirra was the State's second national park and was managed by the Commissioner of National Parks and Wildlife Reserves. Four years later management was transferred to the newly formed National Parks Commission. In 1972, following the consolidation of environmental legislation in the form of the National Parks and Wildlife Act, Para Wirra came under the jurisdiction of the National Parks and Wildlife Service. Further parcels of land were purchased through to 1973 so that now an area of 1409 hectares constitutes the reserve.

In 1972 Para Wirra was reconstituted as a recreation park. This reconstitution reflected the park's intended role as a natural area catering for a wide range of recreational activities.

Para Wirra was subject to a number of land uses prior to its gazettal as a reserve. Gold mining was conducted throughout the region during the late 1860s, 1890s, and again during the depression years. Gold mining shafts, adits, tunnels and stone ruins associated with the areas gold mining history are dotted throughout the reserve. Much of the reserve was used for sheep grazing prior to its dedication. During the 1890s, and from 1923 to 1936, wattle bark, once used by the tanning industry, was stripped from trees on leased land within the boundaries of what is now Para Wirra Recreation Park.

There are no known sites of former Aboriginal occupation within the reserve, although the Peramangk people are thought to have occupied the general area prior to European settlement (Tindale, 1974).

Climate

Climatic data for the area indicates that the Park lies between the 508mm and 686mm average annual rainfall isohyets. Typical of the Mt. Lofty Ranges, the summers are the warmest and driest part of the year. Average maximum temperatures from November and March are between 20 and 28 degrees Celsius. The winters are cooler and wetter. The lowest average maximum temperature is in July and falls between 15 and 12 degrees Celsius.

Topography

The park ranges in altitude from 137m above sea level immediately below Devils Nose to just over 328m in the south eastern corner of the park. Seventy six percent of the park lies above the 240m contour (Clarke, 1967).

The landform of the park has been described by Laut et al as a "hilly upland with broad crests and dissected slopes" (Laut et al, 1977). The South Para River in its westward course through the northern section of the park dissects the plateau to form steep sloped valleys and narrow ridge tops. North of the South Para River the land gradually rises to a gently undulating plateau along the park boundary.

The central recreation area of the park consists of an undissected plateau. South of the central plateau Hamlin's Gully separates two ridges which run in a north-west direction. The southern section of the park is dominated by Mack Creek which runs in a north-east direction.

Geology and Soils

Para Wirra Recreation Park lies entirely within an inlier of crystalline basement rock which extends southward to Torrens Gorge. It is part of a more extensive Precambrian rock mass, the oldest in the Mt. Lofty Ranges. As with other inliers in the region, the basement at Para Wirra is exposed as the core of an anticlinal structure, the axis of which trends approximately north-south. The rocks are Lower Proterozoic and believed to have an age in excess of 1,400 million years. To the north, east and west and within 2km are the sedimentary rocks of the enclosing Precambrian cover, estimated as being at least 800 million years old.

As a result of being subjected to a number of periods of deformation and heating, the original nature of the basement rocks has been obscured.

In the extreme west of the park there are undifferentiated, mostly very micaceous rocks (Schists), and gneisses. A zone of distinctive layered or banded quartz-feldspar rich rocks (gneisses) extends through the central portion of the park. In the extreme east is another conspicuous rock type (augen gneiss) which is distinguished by the presence of "eye" structures (usually of feldspar) up to 2.5cm in length.

Epidote is a common mineral in the gneisses. Migration and segregation of minerals has produced plagioclase-feldspar and epidote veins which typically transect the layering of the gneisses. Some of the quartz veins (or "quartz reefs") have been gold-bearing and provided the major prospects in the area. The rather sporadic mineralisation, however, made any profitable ventures short-lived.

Gravels and sands formed a ferruginous capping over the area in the Cainozoic (probably early Tertiary), and their subsequent dissection left hilltop remnants. Two outliers extend into the park, the larger spreading across the northern limits of the park, with a small area of gravels occurring at one locality on the eastern boundary. Being largely derived from the basement rocks of the area, the gravels contain many gold placers, and the extreme northern end of the park there are traces of numerous small prospects.

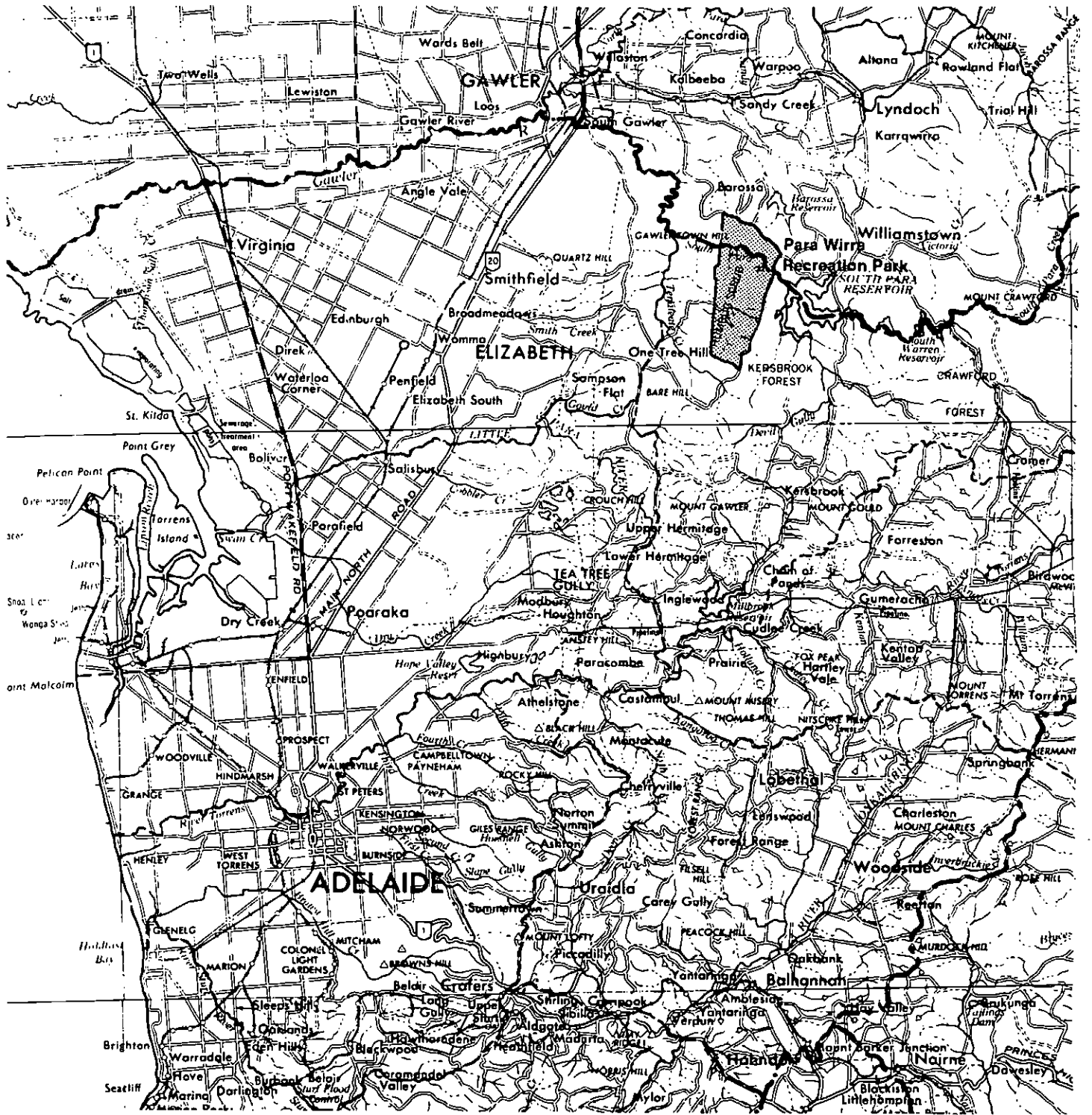


Figure 1

**PARA WIRRA RECREATION PARK
Location Plan**

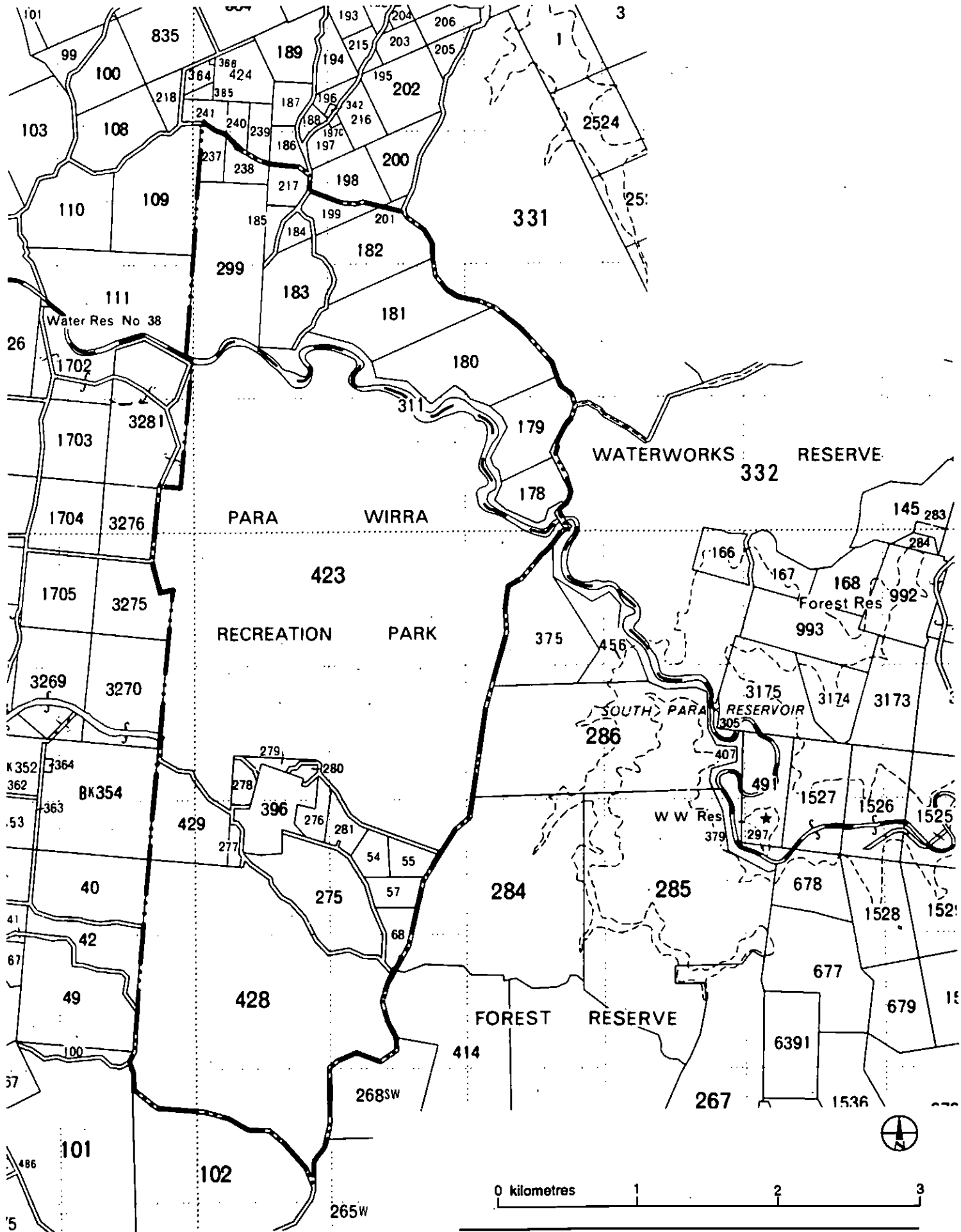


Figure 2

**PARA WIRRA RECREATION PARK
Boundaries and Cadastral Composition**

There appear to be three principal soil types in the park: duplex soils with yellow-grey clay horizons in the southern section of the park, duplex soils with red clay horizons in the north and coarse textured uniform soils on the steep slopes and rocky ridges. The South Para River has limited soil development and consists of deposits of alluvial sands and gravels (Crichton, Harvey and Hill, 1978). All soils are acidic.

Vegetation

The wide variety of vegetation types in Para Wirra Recreation Park have been described by Crichton, Harvey and Hill (1978) as follows.

1. Woodland

The woodland formation is composed of three alliances, represented by combinations of *Eucalyptus leucoxylon*, *E. fasciculosa* and *E. camaldulensis*. *Eucalyptus camaldulensis* is found along the major water courses, while mixtures of *E. leucoxylon* and *E. fasciculosa* are located at the heads of gullies.

Associated tree species are scattered individuals of *Callitris preissii*, *Allocasuarina verticillata*, *Eucalyptus goniocalyx* and introduced species including *Pinus radiata* and *Eucalyptus cladocalyx*.

The woodland understorey consists of scattered bushes of *Acacia pycnantha*, *Dodonaea viscosa* and *Bursaria spinosa* with a lower stratum essentially of *Hibbertia sericea* and *H. exutiacies*, the fern *Cheilanthes austrotenuifolia* and grasses and forbs.

With an increasing component of *Eucalyptus fasciculosa* in the overstorey, the composition of the understorey progresses toward that of the low open forest association. Extra species noted in the understorey include *Leptospermum myrsinoides*, *Calytrix tetragona*, *Hakea ulicina*, *Prostanthera behriana* and *Isopogon ceratophyllus*.

2. Open Woodland - low open woodland

The open woodland formation covers large areas of the central section of the park, these being once partially cleared for grazing or developed for recreation. The open woodland contains the same principal tree species as the woodland, with the addition of *Eucalyptus goniocalyx*. The formation is frequently characterised by dense stands of *Acacia pycnantha*. These plants are generally of two metres or more in height and are accompanied by a highly modified understorey of grasses, mosses, *Hibbertia sericea* and *Hibbertia exutiacies*.

Other smaller patches of woodland exist along the South Para River on those stretches of the river where a flood plain of some metres width is present along one or both sides. *Eucalyptus camaldulensis* dominates the overstorey with *Eucalyptus leucoxylon* and *Eucalyptus fasciculosa* occurring sporadically. The understorey of grasses and forbs is broken only by the sparse incidence of large shrubs. *Eucalyptus porosa* was found to be a minor species in this association, occurring around the North Oval.

3. Low open forest

The open forest formation covers the largest area of any of the formations. In common with the woodland structural formations, the vegetation types classified as low open forest contain as dominant species in the tree stratum the three major eucalypts of the park, *Eucalyptus goniocalyx*, *E. fasciculosa* and *E. leucoxylon*. The low open forest formations can be subdivided into five associations, depending upon the relative proportions of the three eucalypt species present.

- (a) *Eucalyptus goniocalyx* low open forest
- (b) *Eucalyptus goniocalyx* - *E. fasciculosa* low open forest
- (c) *Eucalyptus fasciculosa* low open forest
- (d) *Eucalyptus fasciculosa* - *E. leucoxylon* low open forest
- (e) *Eucalyptus leucoxylon* low open forest.

The incidence of *Eucalyptus goniocalyx* appears to increase in the more sheltered situations. It is also evident that *Eucalyptus fasciculosa* and/or *Eucalyptus leucoxyton* occurring on northern aspects and exposed ridges are often replaced by sparse stands of *Allocasuarina verticillata*, and that *Xanthorrhoea semiplana* in the understorey of the former can be replaced by *X. quadrangulata*.

Generally, the understorey of the low open forest is dominated by *Spyridium parvifolium*, with clearly delineated expanses of *Xanthorrhoea semiplana* sometimes excluding all but the smallest bushes and forbs. *Spyridium parvifolium* is accompanied by *Hibbertia sericea* or *H. exutiacies*, *Astroloma conostephioides*, *Acacia pycnantha* and a ground cover of *Cheilanthes austro tenuifolia*, *Drosera* spp. and leaf litter. In a few areas, particularly in the northern and eastern sections of low open forest, *Prostanthera behriana* grows in clumps, often to a height of two metres.

Along water courses low open forest formations support a greater number of *Eucalyptus leucoxyton* trees, with additional understorey species, including *Acacia paradoxa* and *Bursaria spinosa*.

In the far north-western corner of the park the *Eucalyptus fasciculosa* low open forest exists with an understorey of greater height, density and floristic diversity than other areas, with the noteworthy incidence of *Daviesia brevifolia* and *D. virgata* and the co-existence of three species of *Hakea*, *H. rostrata*, *H. carinata* and *H. rugosa*.

Included in this present description but occupying an area too small to be effectively mapped is an additional formation of the forest type. A small patch of *Eucalyptus goniocalyx* closed forest occurs downslope from the site of the workshop complex. *Eucalyptus fasciculosa* and *E. leucoxyton* are also present but in small numbers. Unlike the generally dense or mid-dense understorey of the low open forest formation, this closed forest supports only a few individuals of *Acacia pycnantha*, *Dodonaea viscosa*, *Pultenaea largiflorens* and *Hibbertia* spp.

4. Closed Scrub

Closed scrub formations are rare in the park, there being two small patches in the southern and one larger area in the north dominated by *Allocasuarina muelleriana* and two in the north dominated by *Eucalyptus odorata*.

Closed scrub - *Allocasuarina muelleriana*

A very small area of closed scrub, dominated by tall and spreading plants of *Allocasuarina muelleriana* occurs in the central-eastern section of the park.

A second patch of *Allocasuarina muelleriana* dominated closed scrub occurs in the northern sector of the park and as for the central location the area is mostly surrounded by low open forest.

Allocasuarina muelleriana encountered in the central eastern area of this formation is countered by a high development of *Xanthorrhoea semiplana*, *Hakea ulicina*, *Acacia myrtifolia* and *Leptospermum myrsinoides*. The contribution to the lower strata by *Hakea carinata*, *Acacia myrtifolia*, *Hibbertia sericea* and *Spyridium parvifolium* in this northern scrub is lacking in the central eastern distribution.

Closed scrub - *Eucalyptus odorata*

The *Eucalyptus odorata* scrub is similarly surrounded, for the most part, by low open forest, but this species totally dominates the formation, there being a sparse understorey only of *Acacia acinacea* and *Correa schlechtendalii* (northern patch) and abundant leaf litter.

Introduced herbs and forbs are present.

5. Eucalyptus open scrub

The several small patches of *Eucalyptus* open scrub in the park contain two naturally occurring but recently recorded eucalypt species in the park, *Eucalyptus socialis* and *E. foecunda*. *Eucalyptus foecunda* also occurs as a minor emergent in the *Melaleuca uncinata* closed heath which is, described below.

Botanically the most interesting occurrence of open scrub is that covered at an area west of Wild Dog Creek. The south-north running ridges of this area offer relatively flat plateaux at the tops of the gullies and steeply sloping east and west faces of the ridges themselves. On one plateau four species of eucalypt occur as whip-stick mallees. *Eucalyptus leptophylla* (3-4 metres), *E. odorata* (2 metres) and *E. socialis* (to 5 metres) mix with the *Eucalyptus fasciculosa* of the surrounding slopes. Stunted specimens of *Acacia pycnantha* also occur in this stratum, but are few in number. Of the patches of *Eucalyptus* open scrub only one contained *E. socialis*. Others are mostly of *E. odorata*, sometimes whip-stick in form, but usually as a low and straggling mallee, surrounded by the expanse of low open forest which dominates the park.

The understorey of the open scrub formation does not seem to distinguish itself from that of the surrounding low open forest, except perhaps in a reduced incidence of all species.

6. Melaleuca uncinata open scrub

Along the north-eastern boundary of the park in the vicinity of the quarried areas, there exists a broad basin, surrounded on three sides by high slopes and tilting to the south-west to feed tributaries of the South Para River. While the higher slopes of the basin are dominated by close heath the lower areas of the water catchment basin support *Melaleuca uncinata* open scrub. Here this species attains a greater height than elsewhere (to 4 metres) and often forms into dense clumps. The diversity of the understorey associated with the closed heath gives way to a predominance of a single species, *Calytrix tetragona*, a species often considered indicative of high soil water levels and impeded drainage.

Short and stunted individuals of *Eucalyptus odorata* are infrequently met with.

The open scrub formation is crossed by several short waterways feeding tributaries to the South Para River. Downslope, in the vicinity of these tributaries, the open scrub quickly gives way to low open forest which occurs generally across this section of the park.

Although the area of *Melaleuca uncinata* open scrub is small, its presence is a distinctive feature of the northern section and mention needs to be made of its existence.

7. Melaleuca uncinata closed heath

As with other formations described for the park the closed heath is not "pure", since isolated trees emerge as an upper stratum. Co-dominants of the 2 metre stratum of *Melaleuca uncinata* are stunted *Acacia melanoxylon*, *Eucalyptus odorata*, and one of the rarely encountered eucalypts of the park, *Eucalyptus leptophylla*.

Below this stratum occur the many sclerophyllous shrubs usually associated with heath formations, making this region one of the floristically richer regions of the park.

Areas of the periphery of the heath support *Callitris preissii* and *Banksia marginata*.

Callitris preissii occurs within both woodland and forest formations. Three areas support stands of perhaps thirty to fifty trees, both mature and regenerating. Typical of areas of native pine concentration, the understorey is much more sparse than the surrounding *Eucalyptus* formations. Both scattered regeneration and individual mature trees of *Callitris preissii* occur throughout the park.

The small areas of abandoned quarries and gravel pits support a diversity of regenerating understorey shrubs. Specific mention needs to be made of the occurrence of *Spyridium vexilliferum* in

the southern gravel pit and *Banksia marginata* and *Santalum acuminatum* along the periphery of the far northern quarry.

The South Para River presents a distinctive habitat of alluvial sands and gravels bounded on both sides by steep slopes. In a few areas these slopes are particularly steep and here *Eucalyptus camaldulensis* is replaced by *Allocasuarina verticillata* and *Xanthorrhoea quadrangulata*. This latter vegetation type is typical of other steep and rocky slopes throughout the park.

The river bed supports a variety of larger bushes not found elsewhere in the park, and particularly *Callistemon salignus* and *Melaleuca oraria*.

There are a variety of weed species present in the park, however, there are few large areas of weed infestation. Identified weed species subject to an ongoing weed control programme include *Watsonia*, olive, boneseed, St. Johns wart, artichoke and salvation jane.

Fauna

Past agricultural and mining practices have significantly modified large areas of available fauna habitat, particularly at ground level. Consequently the native mammal, bird, reptile and amphibian populations have been adversely affected.

1. Mammals

Para Wirra supports a large population of western grey kangaroos (*Macropus fuliginosus*). The size of the population is probably related to the construction of dams and permanently greened areas which have provided permanent water sources and a continual supply of green pick for kangaroos to graze on. Red kangaroos (*Megaleia rufa*) were introduced to the park and are still occasionally observed in the northern section of the reserve.

Other native animals not frequently observed in the park are the small nocturnal yellow-footed antechinus (*Antechinus flavipes*), the ant and termite eating short-beaked echidna (*Tachyglossus aculeatus*), the common ringtail possum (*Pseudocheirus peregrinus*) and the brushtail possum (*Trichosurus vulpecula*).

Introduced mammal species include small populations of hares, rabbits, foxes, goats and cats.

2. Birds

One hundred and twenty species of bird have been recorded in this park. These include the emu which was introduced into the park in 1967. In the aquatic areas of the park some of the birdlife includes grey teal, Australian little grebe and irregularly, depending on the seasons, little black cormorants and little pied cormorants. Along the South Para River, and in the nearby woodland areas, white-faced herons, black ducks, brown goshawks, white-browed babblers and black-chinned honeyeaters are observed. Buff-rumped thornbills and eastern spinebills are often seen along the river and in other areas of the park. A range of birds occur throughout the park including the common bronze wing, brush bronze wing, black faced cuckoo-shrike, scarlet robins, golden whistlers, grey shrike thrush, restless flycatcher, white plumed honeyeater, new holland honeyeater, red browed firetails, purple crowned lorikeet, grey currawong and little raven. White throated treecreepers, brown treecreepers and white-winged choughs are observed in the woodland areas while laughing kookaburras, red rumped parrots and peaceful doves prefer the grass and woodland areas. In areas of dense ground cover family groups of superb fairy wrens search for food. Flitting in the open areas are jacky winters and yellow-rumped thornbills (Alexander, Evans and Hill (1978)).

3. Reptiles and Amphibians

The herpetofauna of Para Wirra comprises 38 recorded species. These include the Long-necked Tortoise (*Chelodina longicollis*), Tree Dtella (*Gehyra variegata*), Marbled Gecko (*Phyllodactylus marmoratus*), Common Scaly-foot (*Pygopus lepidopodus*), Bearded Dragon (*Pogona barbata*), Striped Skink (*Ctenotus robustus*), Common Grass Skink (*Lampropholis guichenoti*), the Shingle Back (*Tiliqua rugosa*) and the

Eastern Blue-tongued Lizard (*Tiliqua scincoides*). Five species of amphibians are found in the Park. These include the Brown Tree Frog (*Litoria ewingi*), Bull Frog (*Limnodynastes dumerilli*), Marbled Frog (*Limnodynastes tasmaniensis*), Bibron's Toadlet (*Pseudophryne bibroni*) and Brown Froglet (*Crinia signifera*). (Alexander, Evans and Hill, 1978). The yellow faced whip snake (*Demansia psammophis*), the brown snake (*Pseudonaja textilis*) and the red bellied black snake (*Pseudechis porphyriacus*) have also been sighted in the Park.

MANAGEMENT CONTEXT

Five principle considerations influence the management and development of Para Wirra Recreation Park. These are the purpose of original government acquisition, the management of features of European cultural heritage interest, the planned development of the northern metropolitan suburbs, the regional conservation significance of the native vegetation of Para Wirra, and the **Mt. Lofty Ranges Review**.

Purpose of original government acquisition

Para Wirra was established as a National Park in 1962 and was re-dedicated a Recreation Park in 1972. The expanding population of the satellite city of Elizabeth and the suburb of Salisbury during the late 1950s and 1960s provided the major impetus for establishing a reserve. From its inception, Para Wirra was envisaged as providing recreation facilities in a natural setting for residents of the northern suburbs.

Consistent with this original objective, 72.7% of respondents to a visitor survey of Para Wirra Recreation Park resided in the northern metropolitan suburbs of Adelaide (Suter, 1990).

Para Wirra Recreation Park is strategically well placed to provide a range of recreation experiences with a particular emphasis on walking and picnicking in a natural setting.

The reserve also forms part of the third largest block of contiguous vegetation in the Mt. Lofty Ranges. The planning and management of recreation activities within the park must be consistent with its regional conservation significance.

Management of features of European cultural significance

Mine shafts, adits, remnant dwellings, boiler and battery foundations remain from Para Wirra's gold mining era. During the 1860s, 1890s and again during the Depression years, gold miners sought their fortunes in the alluvial deposits and quartzite seams of the bed-rock of present day Para Wirra Recreation Park.

The initial optimism sparked by early discoveries of gold was short lived. The largest nugget found weighed only 200g, and the total value of gold extracted from the goldfields between 1868 and 1871 was only about 180,000 pounds.

Although gold miners did not make a fortune, they left a rich historical legacy for present day visitors to the park. In addition to the protection of these sites of historical interest, the safety issues posed by the shafts and adits must also be addressed. There are an estimated 200 vertical shafts up to 30 metres deep and adits running up to 150 metres underground concentrated in the north west corner of the park.

In addition to protecting sites of historical interest, strategies formulated to manage the gold mining area must also address the public safety issues posed by the shafts and adits.

The development of the northern metropolitan suburbs

Para Wirra is located in close proximity to centres targeted as population growth areas. The population of Salisbury is anticipated to peak at 120,000 by the turn of the century. The population of Munno Para is expected to expand from 32,000 to 70,000 inhabitants during the next 20 years. Tea Tree Gully (which includes the Golden Grove Development) and Gawler are also targeted as growth centres. Elizabeth is expected to decline in population due to the high proportion of elderly people currently living there. The Mount Lofty Ranges Review Investigations Report (March 1989) noted that the average annual percentage

population increase for the Ranges has been 4.6%. The Investigations Report states that the predicted minimum growth under present planning controls would be from the 1986 figure of 130,000 to about 180,000 possibly by the year 2003. Figure 3 illustrates the anticipated changes in population distribution in Adelaide by the year 2006.

Expansion of the northern suburbs and the Mt. Lofty Ranges will increase pressure on reserves in the Mt. Lofty Ranges. In response to this situation the State Government developed the concept of setting aside a linked system of public and private land to provide a visual contrast to urban areas and to provide for a range of recreational opportunities. This concept is known as the Metropolitan Open Space System (Department of Environment and Planning, 1987). Para Wirra Recreation Park is part of the land incorporated in the Metropolitan Open Space System. Humbug Scrub, which is adjacent to Para Wirra, is also identified as an important conservation area. Figure 4 shows the location of Para Wirra and Humbug Scrub in relation to the Metropolitan Open Space System.

Management strategies must be formulated in the context of the anticipated steady increase in the use of Para Wirra in order to protect the conservation and recreation values of the reserve.

Mt. Lofty Ranges Review

The Mt. Lofty Ranges are of particular importance to South Australia. They support stands of remnant native vegetation, a productive agricultural and softwood forestry industry, provide approximately 60% of Adelaide's annual water needs and are an important recreation and tourism resource (Mt. Lofty Ranges Review Strategy Report 1990).

In recognition of the uniqueness of the Ranges and the emergence of land use conflicts, the Government established the Mt. Lofty Review process. Three reports have resulted from this process, the Investigations Report, the Consultative Management Plan and the Strategy Report. The Strategy Report provides an action plan and sets the direction for planning and management of the Mt. Lofty Ranges.

The Strategy Report lists 5 objectives:-

- (a) to maintain and enhance the natural resources,
- (b) to enhance the catchments as a source of high quality water,
- (c) to ensure the long term sustainability of rural production,
- (d) to preserve and restore remnant native vegetation,
- (e) to enhance the amenity and landscape for the enjoyment of all South Australians.

The following key issues were considered in the context of the objectives:-

- environmental protection,
- surface water runoff,
- primary production and rural living,
- mining,
- townships,
- tourism and recreation,
- bushfires.

The key issues of environmental protection, tourism and recreation, and bushfires directly impinge on the management of reserves in the Mt. Lofty Ranges. The Strategy Report identifies the need to expand and consolidate reserves in the Mt. Lofty Ranges (Strategy Report, 1990, p.13) in order to ensure their protection. In relation to Para Wirra, this action is consistent with objective 10 of the Plan of Management, that is, to acquire land to rationalise boundaries, protect habitat, or features of scientific, geological or historical interest.

The Strategy Report (1990) states that 85% of South Australia's tourism activity occurs in Adelaide or the three nearby tourism regions of the Mt. Lofty Ranges - Barossa Valley, Adelaide Hills and Fleurieu

1986

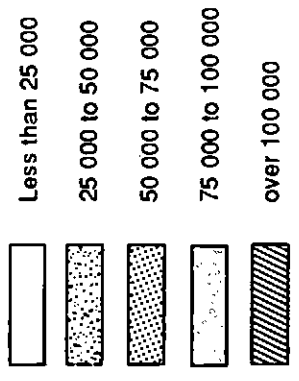
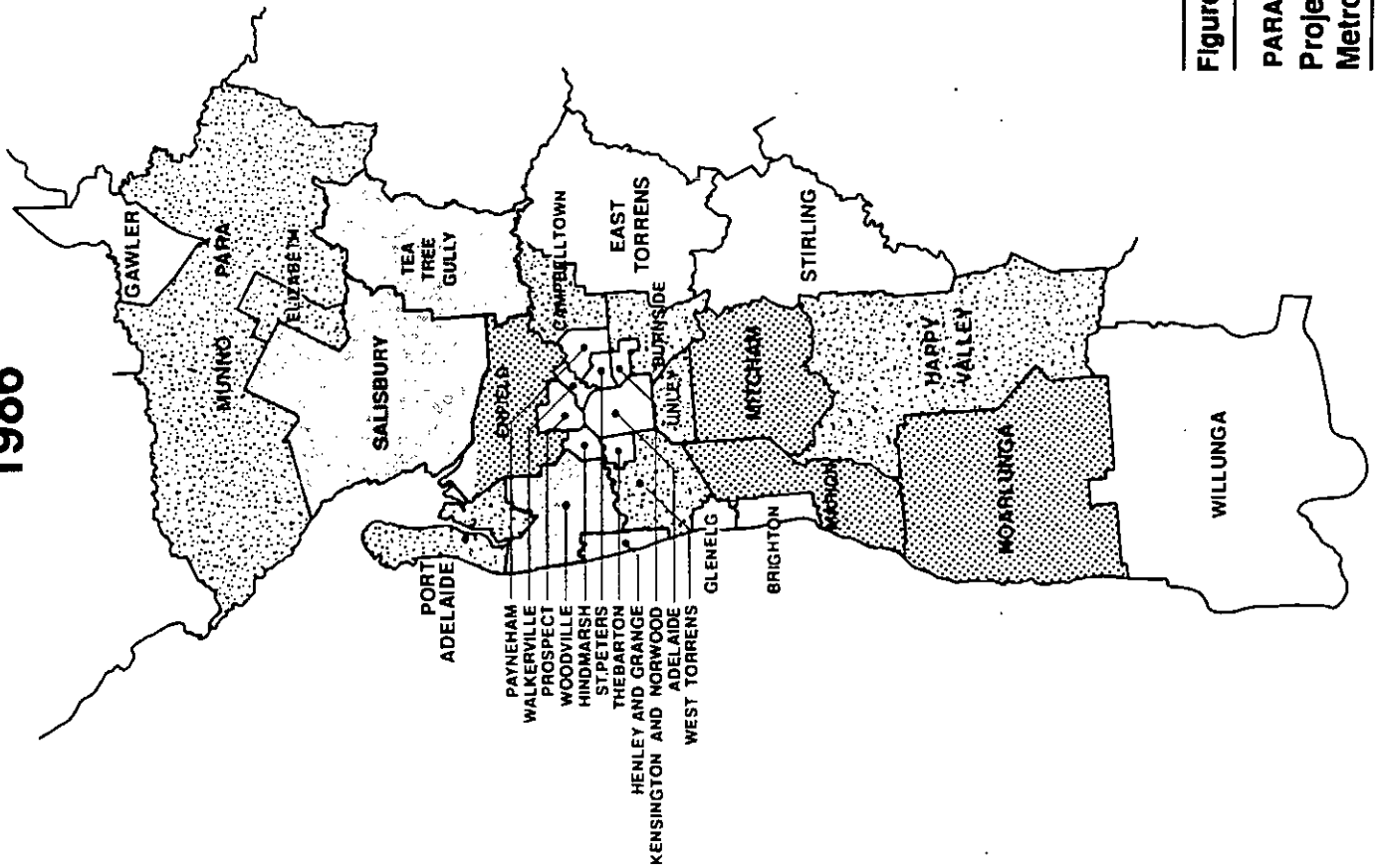
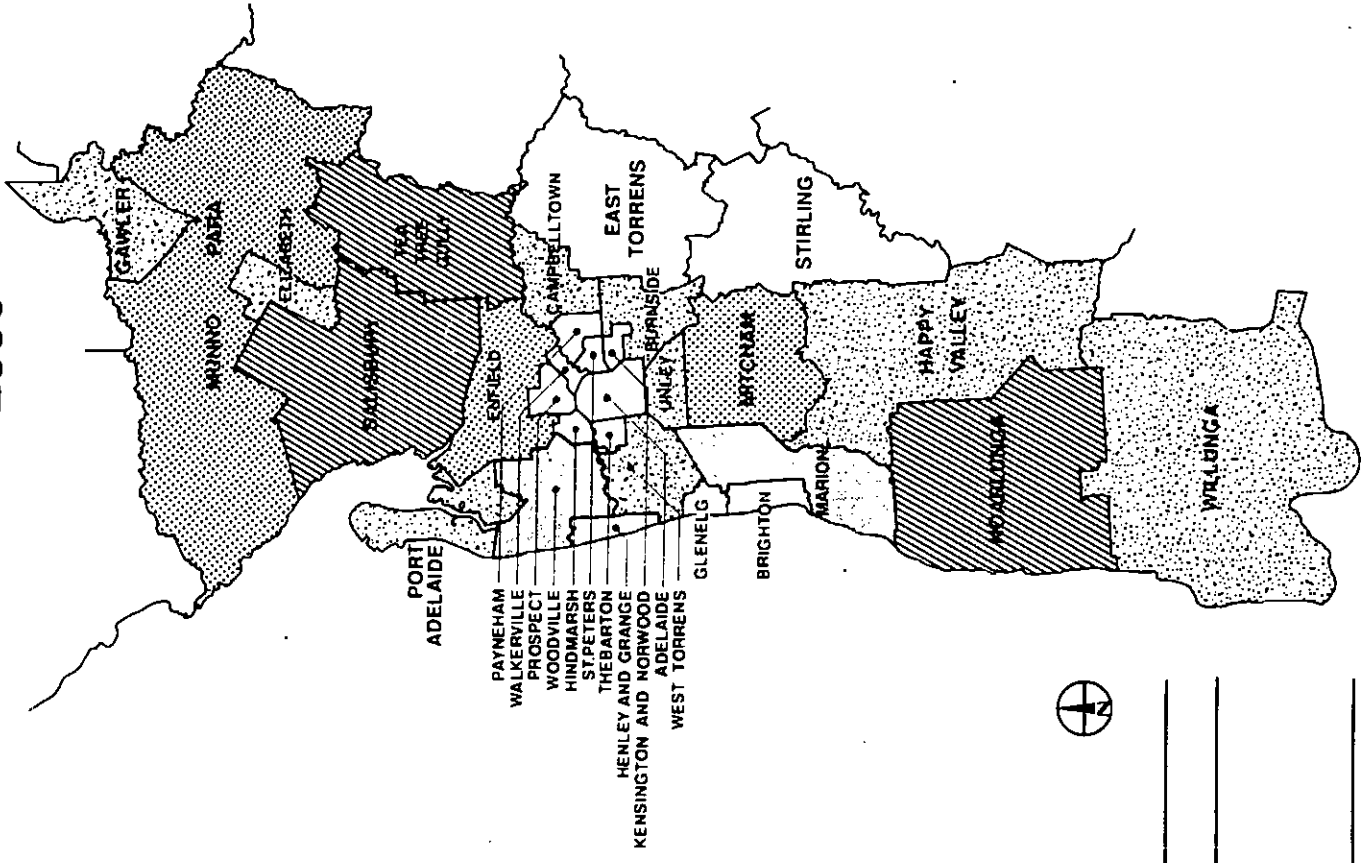


Figure 3

PARA WIRRA RECREATION PARK
 Projected Population,
 Metropolitan Local Govt. Areas

2006



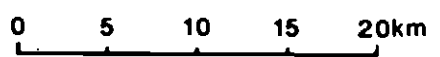
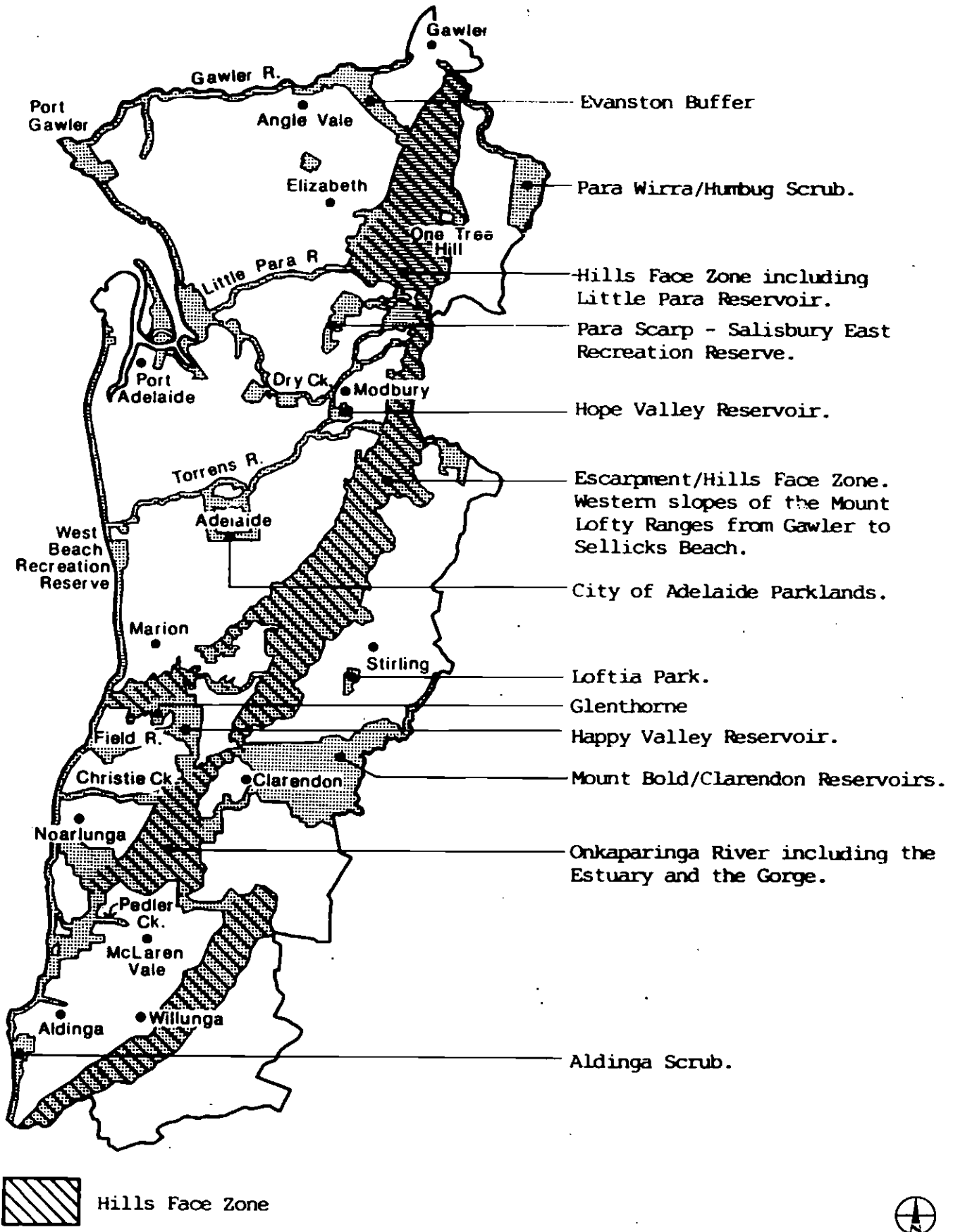


Figure 4

PARA WIRRA RECREATION PARK
Metropolitan Open Space System

Peninsula. Sandwiched as it is between Adelaide and the Barossa Valley, Para Wirra Recreation Park is within the tourism growth area. The Strategy Report (1990) states that Tourism S.A.'s emphasis on "short breaks" and day trips will involve encouraging heritage and nature interpretation based operations (p.44). In view of this there is likely to be increased demand placed on Para Wirra Recreation Park and other reserves in the Mt. Lofty Ranges.

The Strategy Report points out that the proximity of the Ranges to the metropolitan area of Adelaide makes them one of the most important outdoor recreation resources in Adelaide (Strategy Report, 1990, p.44). The wide range of recreation activities pursued means there is considerable potential for conflict between recreation uses and the likelihood of actual environmental impacts. The management of recreation activity in Para Wirra Recreation Park is discussed under Objective 1 of the Plan of Management.

The objectives of management for Para Wirra Recreation Park are consistent with and fit within the context of the following Tourism and Recreation goals and objectives defined in the Strategy Report (pp 44, 45).

- . To retain the area's environmental character and individual regional differences in heritage and activities which constitute its tourism appeal and viability.
- . To ensure that tourism developments are compatible with the environment and with existing uses.
- . To manage increasing levels of visitation.
- . To provide opportunities for recreational experiences in accordance with environmental objectives and community needs.
- . To avoid or minimise conflicts between recreation activities.

Objective 3 of the Para Wirra Plan of Management deals with the issue of fire management in a manner which is consistent with the bushfire management goal specified in the Strategy Report (1990), that is to "minimise hazard to life and property within the Ranges consistent with the overriding conservation objectives" (p. 48).

The Regional Conservation significance of the native vegetation of Para Wirra

Seventy four percent (74%) of the native vegetation cover of the Mt. Lofty Ranges has been cleared since World War II (Mt. Lofty Ranges Review Consultative Management Plan, March 1989). There are few large blocks of vegetation remaining in the Mt. Lofty Ranges. Much of the vegetation cover occurs in discreet isolated blocks of remnant vegetation.

The vegetation patch which includes Para Wirra Recreation Park is the third largest patch (2573 hectares) of native vegetation within the Adelaide Hills. The vegetation patch to the south and south-east of the Parks is the fourth largest patch (1948 hectares) of native vegetation in the Adelaide Hills (refer to Native Vegetation Patches, Adelaide Hills, Figure 5).

Para Wirra Recreation Park is the only National Parks and Wildlife Reserve in which the following floristic classes are present and hence represents the only area in the Adelaide Hills where the floristic classes listed below are legally protected (see Table 1 and Figures 5 and 6).

LOW WOODLAND

Eucalyptus fasciculosa/Callitris preissii/Dodonaea viscosa/ Hakea rugosa

WOODLAND

Eucalyptus fasciculosa/Eucalyptus leucoxydon/Hibbertia riparia/Gonocarpus elatus/Cheilanthes austrotenuifolia

WOODLAND

Eucalyptus camaldulensis/Acacia verniciflua/Bursaria spinosa/Callistemon paludosus

The following floristic classes are not represented within Para Wirra Recreation Park, but are represented in the surrounding vegetation patches (refer to Native Vegetation Structure and Floristic Class maps for Para Wirra Recreation Park and Surrounding Areas, Figure 7).

WOODLAND

Eucalyptus obliqua/Eucalyptus goniacalyx/ Daviesia ulicifolia/Lomandra fibrata

LOW WOODLAND - HEATH

Eucalyptus fasciculosa/Acacia paradoxa/Xanthorrhoea tateana/ Drosera whittakeri

WOODLAND

Eucalyptus camaldulensis/Eucalyptus leucoxylon/Anagallis arvensis/Linium trigynum/Eucalyptus leucoxylon/Eucalyptus viminalis/Scaevola albida

OPEN FOREST

Eucalyptus obliqua/Rubus ulmifolius

Table 1 Vegetation class statistics for Para Wirra Recreation Park

ATT2 Code	Area within Para Wirra Rec. Park	% of Park Area	% Conserved in Park rel. to surrounding area	Area in Adelaide Hills	Area in NPWS Res. within Adelaide Hills	% Conserved in Para Wirra rel. to Adelaide Hills	% Conserved in Para Wirra rel. to other NPWS Res.
3	352.9	31.0	39.9	2,114.1	824.8	16.7	42.8
4	50.4	4.4	3.4	2,417.2	94.2	2.1	53.5
5	14.6	1.3	34.0	476.3	37.7	3.1	38.9
6	103.7	9.1	63.7	376.9	265.2	27.5	39.1
7	66.6	5.8	10.1	657.8	66.6	10.1	100.1
22	40.2	3.5	63.5	330.5	82.7	12.2	48.7
23	500.0	43.9	62.1	894.9	500.0	55.9	100.0
26	11.1	1.0	55.8	106.6	11.1	10.4	100.0

Note: See Appendix A for ATT2 code descriptions. All areas in Table 1 are given in hectares

Objectives of management must reflect the conservation significance of the vegetation of Para Wirra and the surrounding area, to preserve the diversity of plant species and associations, to protect native animal habitat, water quality and recreation and amenity values.

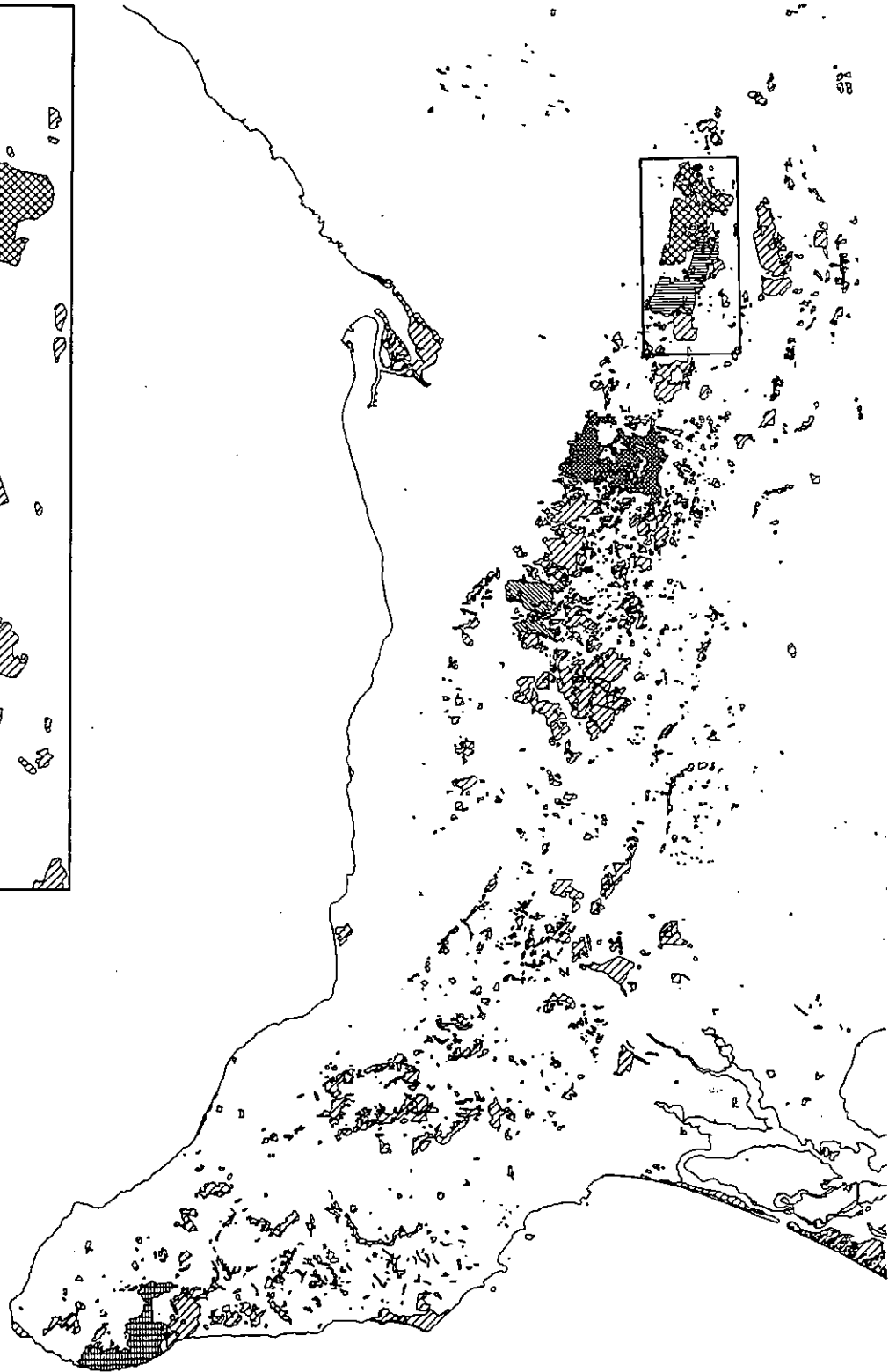
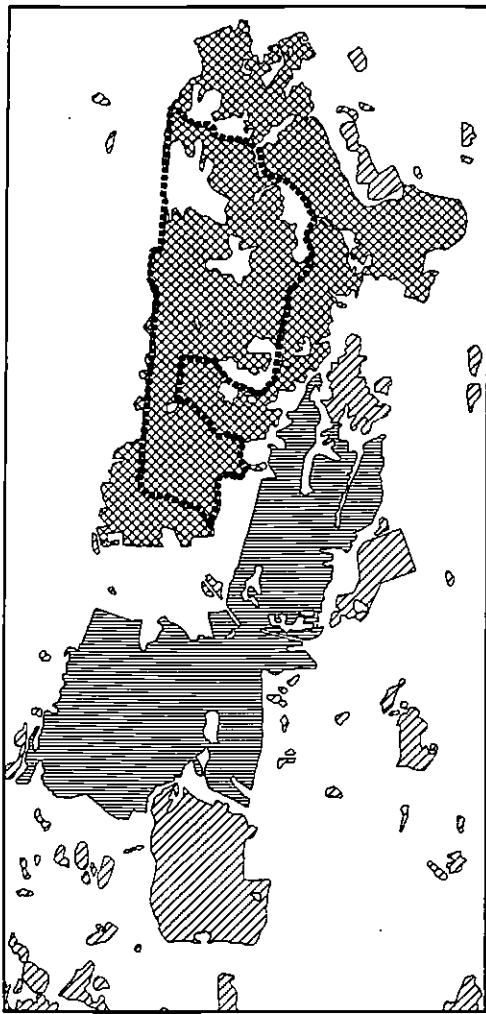
MANAGEMENT PHILOSOPHY

An estimated 60,000 people come to Para Wirra Recreation Park annually to engage in a range of recreation activities including bushwalking, barbecuing and tennis.

Para Wirra Recreation Park is of conservation significance from a regional point of view because it forms part of the third largest block of contiguous native vegetation in the Mt. Lofty Ranges.

It is the purpose of this plan to establish guide-lines to determine the extent, nature and mix of permissible recreation uses, consistent with the natural and historical values of the area and the **National Parks and Wildlife Act, 1972**, as amended.

Para Wirra Recreation Park should provide a range of recreation opportunities consistent with its conservation significance and its importance and proximity to the expanding population of the northern metropolitan area.



- Para Wirra Recreation Park
- ▨ 5th Largest Vegetation Patch (1558 Ha.)
- ▧ 4th Largest Vegetation Patch (1948 Ha.)
- ▩ 3rd Largest Vegetation Patch (2573 Ha.)
- 2nd Largest Vegetation Patch (2708 Ha.)
- Largest Vegetation Patch (3768 Ha.)
- ▬ Native Vegetation Present

Scale 1:450000
0 20km



Produced: Information Systems Branch,
November 1990, Department of
Environment and Planning

G.I.S: ARC/INFO by ESRI

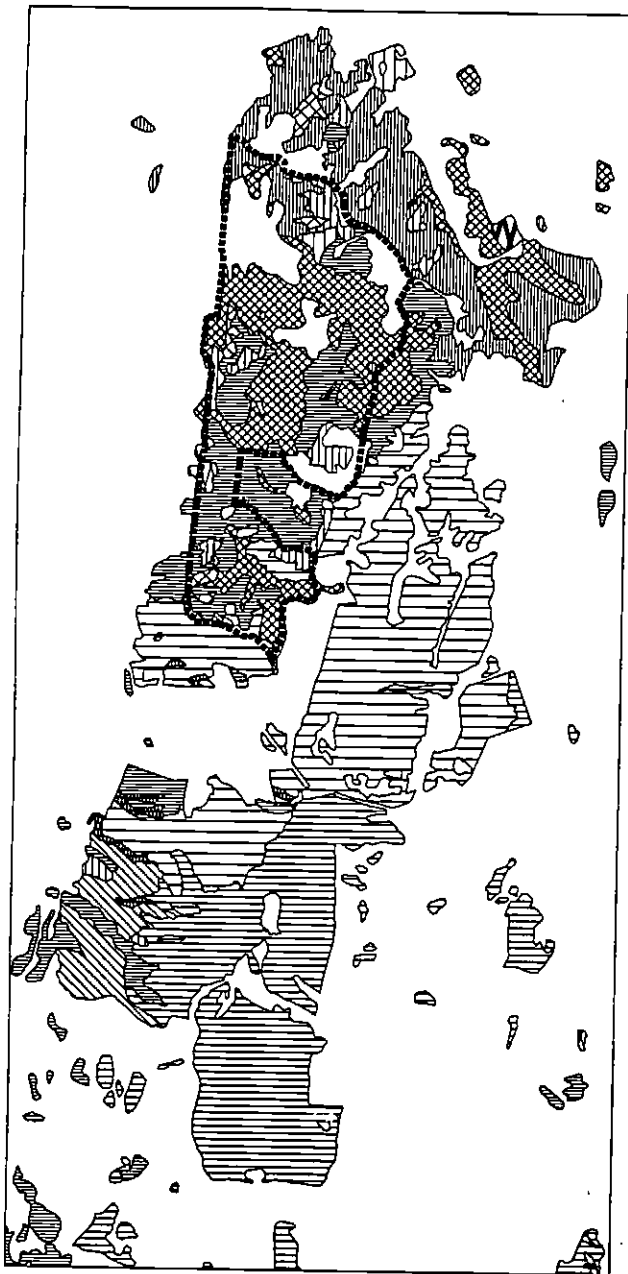
Projection: Transverse Mercator

Figure 5

PARA WIRRA RECREATION PARK

Native Vegetation Patches

Source: Native Vegetation Patches Adelaide Hills
Information Systems Branch D.E. Planning



- PARK BOUNDARY
- MODIFIED LAND
- ▨ 12 WOODLAND
Eucalyptus obliqua/*Eucalyptus goniocalyx*
Daviesia ulicifolia/*Lomandra fibrata*
- ▩ 13 LOW WOODLAND
Eucalyptus fasciculosa/*Eucalyptus goniocalyx*
Acacia paradoxa/*Acrotriche depressa*
- ▧ 14 LOW WOODLAND
Eucalyptus fasciculosa/*Eucalyptus goniocalyx*
Goodenia primulacea/*Drosera whittakeri*
- ▦ 21 LOW WOODLAND
Eucalyptus fasciculosa/*Allocasuarina verticillata*
Scaevola albida/*Cheilanthes austrotenuifolia*
- ▥ 22 LOW WOODLAND
Eucalyptus fasciculosa
Hakea rostrata/*Xanthorrhoea semiplana*
- ▤ 23 LOW WOODLAND
Eucalyptus fasciculosa/*Callitris preissii*
Dodonaea viscosa/*Hakea rugosa*
- ▣ 26 LOW WOODLAND - HEATH
Eucalyptus fasciculosa
Acacia paradoxa/*Xanthorrhoea tateana*
Drosera whittakeri
- ▢ 6.1 WOODLAND
Eucalyptus leucoxyton/*Eucalyptus fasciculosa*
Eucalyptus odorata
**Ehrharta longifolia*
- 6.2 WOODLAND
Eucalyptus fasciculosa/*Eucalyptus leucoxyton*
Hibbertia riparia/*Gonocarpus elatus*
Cheilanthes austrotenuifolia
- 7.1 WOODLAND
Eucalyptus camaldulensis/*Eucalyptus leucoxyton*
Anagallis arvensis*/Linium trigynum*
- ▤ 7.2 WOODLAND
Eucalyptus camaldulensis
Acacia verniciflua/*Bursaria spinosa*
Callistemon paludosus
- ▣ 8.1 WOODLAND
Eucalyptus leucoxyton/*Eucalyptus viminalis*
Scaevola albida
- ▢ 9.1 OPEN FOREST
Eucalyptus obliqua
**Rubus ulmifolius*

Floristic vegetation classes describe the composition of the native plant communities in terms of species that commonly occur together. The classes were derived using objective numerical methods to analyse site specific plant species listings.

Produced: Information Systems Branch,
November 1990, Department of
Environment and Planning

G.I.S.: ARC/INFO by ESRI.

Projection: Transverse Mercator



Figure 6

PARA WIRRA RECREATION PARK

Native Vegetation Floristic Classes
Para Wirra Recreation Park and Surrounding Areas

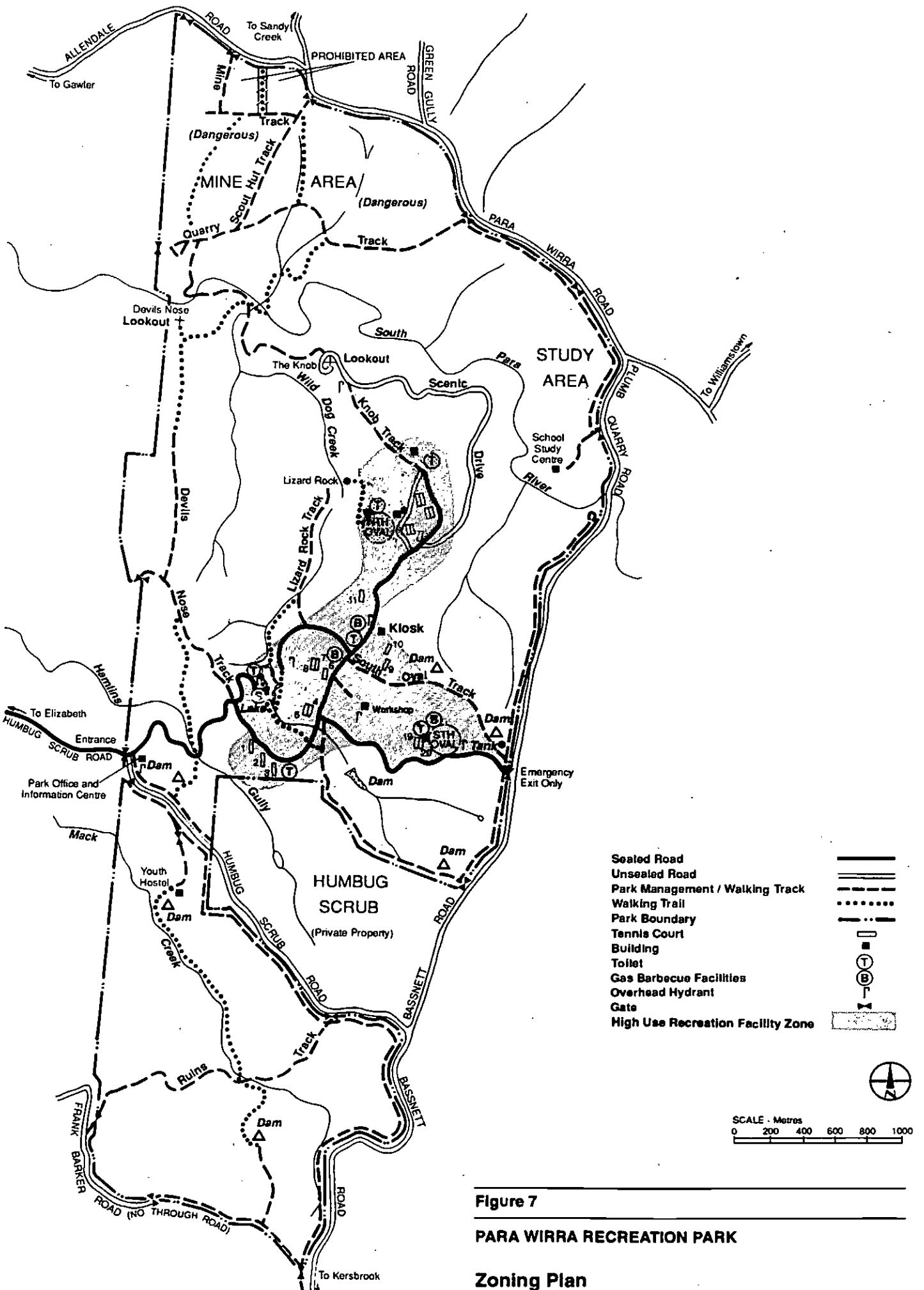


Figure 7

PARA WIRRA RECREATION PARK

Zoning Plan

The management planning process is designed to evaluate all reasonable options and to arrive at the most suitable use of the park.

The naturalness of the reserve should be emphasised and built developments will be largely restricted to the existing intensive use recreation zone in the centre of the park.

Para Wirra should provide mutually compatible recreation opportunities in a natural bush setting that cannot be provided in highly urbanised settings such as council reserves, playgrounds and urban parks. Facility-based recreation activities should be largely restricted to the central recreation area.

OBJECTIVES OF MANAGEMENT

1. Provide opportunities for a range of recreational activities consistent with other park management objectives.
2. Protect the natural assets of the park, manage wildlife and control noxious weeds, exotic plants and feral animals.
3. Undertake management practices to reduce the frequency and severity of bushfires and to suppress fires in and adjacent to the reserve.
4. Protect and enhance the landscape values of the park.
5. Provide staff to manage the park and associated infrastructure.
6. Provide visitor services and facilities through concessionaire arrangements where appropriate and consistent with other park management objectives.
7. Promote community involvement through volunteer groups in the care and maintenance of the park.
8. Develop constructive working relationships with neighbouring landowners, government agencies and local councils to address joint management issues where appropriate.
9. Protect historical features within the reserve.
10. Acquire land to consolidate boundaries, protect habitat or features of scientific, geological or historical interest.
11. Provide information, education and interpretation services to enhance visitor enjoyment and awareness.

CONSIDERATIONS AND STRATEGIES

OBJECTIVE 1

Provide opportunities for a range of recreational activities consistent with other park management objectives.

Background

Para Wirra was established as a National Park in 1962, with the aim of providing a recreational resource similar to Belair National Park, for the rapidly expanding population of the northern suburbs.

Management focus during the 1960s and 1970s was on the establishment of picnic grounds, tennis courts, ovals and other infrastructure intended to cater mainly for the recreation needs of new residents of the developing suburbs of Salisbury and Elizabeth.

Existing facilities (1991) include 20 tennis courts, 2 ovals and a grassed picnic area. Other facilities include a network of walking trails, barbecue/picnic sites, 15 gas barbecues, horse riding trails, picnic tables and chairs, 6 toilet blocks, an office/information centre, kiosk (operated by a lessee), school study centre (managed by the Education Department) and youth hostel (managed by the Youth Hostels Association).

Current Use and Visitor Demand

The 1980s and early 1990s have seen a decline in visitor numbers at Para Wirra. Annual visitation (1990/91) is estimated to be 60,000 people per annum. There has also been a parallel decline in facility hire rates (Suter, 1990). The decline in visitor numbers and facility hire rates may be due to socio-economic factors, the establishment of high standard recreation facilities by local councils or a shift in user demand.

The observed decline in visitor numbers seems at odds with the proposed expansion of Adelaide's northern metropolitan area over the next 20 years (DEP, 1987), and emphasises the need to consider the role of Para Wirra as a recreation and conservation resource for the present and future residents of the northern metropolitan area. To assist in the formulation of this management plan, a survey was commissioned in 1989/90 to assess the needs and expectations of park users and residents of the northern metropolitan area (Suter, 1990). The survey was in two parts, a visitor survey which was conducted at Para Wirra and a residential survey which was mailed out to a sample of residents of Adelaide's northern metropolitan area.

The results of the study that are pertinent to recreation management planning can be summarised as follows. The park was generally rated positively (Suter, 1990). On the basis of the survey results, Para Wirra appears to be an important recreational resource for the northern metropolitan suburbs of Adelaide. It is interesting to note that 72.7% of respondents to the on-park visitor survey resided in the northern metropolitan suburbs of Adelaide. The park's natural environment and scenery would appear to be of greater importance than recreation facilities. A large percentage of visitors utilised the walking track network. Walking, barbecuing and picnicking were the most popular recreational activities (Suter, 1990). Recreation activities and facilities play a major role in the development of environmental awareness and in the formation of environmental ethics.

Actions

Visitor demand for, and the cost effectiveness of maintaining, highly structured recreation facilities are factors which will influence any decisions to rationalise the number of tennis courts, ovals and picnic areas maintained in service.

Recreation facilities that are retained in service should be maintained to a high standard. Walking trails should be given high priority and maintained, and interpreted to a high standard. Orienteering will be permitted in the park subject to agreement on the number, timing, location and planning of events.

Horse riding will continue to be permitted in the southern section of the reserve, subject to the management considerations outlined under objective 2. Horse riding is a potentially high impact activity which could have a detrimental impact on the park if not managed carefully. The co-operation of the horse riding community will be sought in addressing this management issue.

OBJECTIVE 2

Protect the natural assets of the park, manage wildlife, control weeds, exotic plants and feral animals.

Background

Protection management must take into account statutory requirements to control weeds, manage wildlife, control vermin and undertake soil conservation measures. Fire protection is discussed under objective 3. The boundary of Para Wirra is contiguous with, and forms part of a 2,573 ha block of native vegetation, collectively managed by the Engineering and Water Supply Department, the Woods and Forest Department and the National Parks and Wildlife Service. As only twenty six percent (26%) of the Mt. Lofty Ranges remains uncleared, a block of native vegetation of this size is important in terms of its representativeness of vegetation types, for the maintenance of diversity of animal and plant species, maintenance of water quality, and as a valuable recreational resource for the community.

The high conservation value of Para Wirra and its regional significance justifies a comprehensive programme of weed control. Priority must be given to statutory requirements to control Schedule 1 and Schedule 2 weeds as proclaimed under the Animal and Plant Control Act, 1980. The National Parks and Wildlife Service also has a priority list of community pest plants, such as boneseed and other exotic plant species which need to be controlled throughout the park, subject to available resources. Revegetation programmes aimed at re-establishing indigenous plant species and suppressing weed growth will be undertaken as resources permit.

The vegetation of Para Wirra has been subject to over-grazing by western grey kangaroos. The population density of the western grey kangaroo and their impact on native vegetation is being studied to determine the best method of controlling their impact.

A successful goat eradication programme was conducted at Para Wirra in 1989/90 by the Animal and Plant Control Commission. Rabbits and hares are not major pest animals in the park, although they can have an adverse impact on revegetation programmes, and may need to be controlled in such situations.

There are some soil erosion problems within the reserve, particularly on the steeper sections of fire access tracks and some walking tracks, as well as in the lake area.

Actions

The National Parks and Wildlife Service will act in co-operation with adjoining land management authorities to develop joint management strategies to address common protection issues where appropriate.

The National Parks and Wildlife Service will continue to meet its statutory obligations to control Schedule 1 and Schedule 2 weeds as proclaimed under the **Animal and Plant Control Act, 1986**. Revegetation programmes and the control of pest plants and exotic plant species will be undertaken as resources permit.

Management strategies addressing the problem of overgrazing and excessive kangaroo population densities will be formulated and implemented on the basis of their research.

Feral goat, rabbit and hare numbers will be monitored and control programmes instigated if, and when, necessary.

Particular attention should be directed to soil conservation on walking tracks, fire access tracks, in the lake area and in any area where new work is to proceed. Existing vehicle tracks that also serve as horse trails in the southern section of the park should be closely monitored to ensure soil erosion and any introduced weeds are effectively managed. Improved directional signage and closer liaison with horse riders should ensure riders keep to designated fire tracks to forestall a proliferation of tracks and potential erosion and weed problems.

Boundary fencing will be adequately maintained in consultation with adjoining landowners. Any necessary internal fencing and entry points will be erected where and as required.

OBJECTIVE 3

Undertake management practices to reduce the frequency and severity of bushfires and to suppress fires in and adjacent to the reserve.

Background

The fire history of the park indicates that, with the exception of the 1975 fire, Para Wirra has had a number of small fires which have been located and suppressed rapidly. The 1975 fire originated outside the park and burnt a large tract of land throughout the southern section of the park. There has not been a fire of greater than 10 ha in the northern section of the park since 1968.

The low frequency and severity of past fires does not obviate the need to undertake appropriate fire management practices, as the likely increased public use of the park dictates the need for effective fire management and fire prevention practices. A Bushfire Prevention Plan for Para Wirra Recreation Park has been prepared and incorporated in the Munno Para and Barossa Council District Bushfire Prevention Plans. The sub division of land adjoining the park means the potential for fires starting is increased and there is a concomitant need to take reasonable measures to protect neighbouring landowners from fires emanating from the park. This does not diminish the responsibility of surrounding landowners to meet their statutory obligations, as defined in the **Country Fire Act, 1989**, which promotes individual and community responsibility for fire prevention.

Actions

The National Parks and Wildlife Service will continue to maintain fire access tracks and fuel reduction zones in accordance with the parks Fire Prevention Plan.

The National Parks and Wildlife Service will integrate fire prevention planning at Para Wirra Recreation Park with district fire prevention planning by having representation on the relevant District Prevention Committees.

The Service will draw up a comprehensive fire suppression plan for Para Wirra Recreation Park which will identify priority areas and strategies of fire attack. The local C.F.S. should be acquainted with, and be given an opportunity to comment on this plan.

Operational procedures put in place in the Lofty Region and encapsulated in the District fire response plan will apply to Para Wirra Recreation Park each summer.

OBJECTIVE 4

Protect and enhance the landscape values of the park.

Background

To ensure the protection of the landscape values of the park, consideration must be given to ensure sensitive location and design of facilities and developments.

The park can be divided into two zones based on the criterion of intensity of use and concentration of facilities. There is a distinguishable highly developed recreation facility zone and a low impact zone. Highly structured recreation facilities and activities are confined to the centralised high use recreation area shown in Figure 6. The low impact zone, which covers the remainder of the park, is of conservation and/or historical significance and is available for walking, orienteering and other activities that have a minimal environmental impact. Within this zone are designated walking trails and fire access tracks. Bus and car parking areas have been constructed to provide access to the northern section of this zone, and to the trail head of the Barossa Goldfield walk. Safety fencing and signs have been erected in the northern section of this zone to address the public safety issues associated with open mine shafts and adits. Individual shafts, adits and an area of intense mining activity in the northern section of the park have been gazetted prohibited areas to give this management strategy, which aims to protect human life and avert injury, legislative force.

Actions

A recreation facility development zone and a low impact zone will be formally defined in this plan of management to reflect existing use patterns.

The recreation facility zone will remain the area of major facility concentration and development. Existing built facilities should be assessed to determine their level of use and function. Any future developments will be in sympathy with conservation objectives and the landscape values of the reserve.

The architectural theme of any construction or building modifications should reflect the colours and textures of the site and should improve existing architectural forms, where appropriate.

The low impact zone will be retained for low impact recreational activities and will be managed to protect the conservation and historical values of this zone.

The safety fencing and signs in the mines area will be maintained and regulations applying to the prohibited area will be enforced.

OBJECTIVE 5

Provide staff to manage the park and associated infrastructure.

Background

Sixty thousand people visit Para Wirra annually and engage in a range of recreational activities that require management. There is also considerable capital invested in infrastructure that requires maintenance.

The National Parks and Wildlife Service requires staff to manage park visitors, infrastructure and to meet the statutory obligations of the National Parks and Wildlife Act, 1972 and other relevant legislation.

Action

Para Wirra will be administered by the Lofty Region presently operating from Cobbler Creek Recreation Park and managed on a day to day basis by a compliment of Rangers and Park Assistants based within Lofty Region.

OBJECTIVE 6

Provide visitor services and facilities through concessionaire operations where appropriate and consistent with other park management objectives.

Background

A concessionaire operation is a service provided by the private sector on an entrepreneurial basis through negotiation with a government agency. The National Parks and Wildlife Service has had a concessionaire arrangement with various kiosk lessees since 1963. The kiosk is centrally located in the recreation facility zone and provides a refreshment service and sells souvenirs. The kiosk was generally rated positively by the 67.7% of visitors who used the kiosk during the Para Wirra visitor survey period (Suter, 1990).

There is scope for some additional concession operations within the park which may include guided bushwalks.

Non-commercial leases have been entered into with the Education Department for the Study Centre and with the Youth Hostels Association for the maintenance and management of the Youth Hostel.

Action

The kiosk and the associated services that are provided by the kiosk lessees are managed in accordance with the terms and conditions of the negotiated lease and associated licenses and agreements.

Proposed development of the kiosk services and any other concessionaire operation will be required to be consistent with the plan of management, of a nature and quality defined by the Service, and should enhance the appropriate use and visitor enjoyment of the reserve.

Non-commercial leasing arrangements with the Education Department and the Youth Hostel Association will continue for the duration of the respective agreement.

OBJECTIVE 7

Promote community involvement through volunteer groups in the care and maintenance of the park.

Background

The Service continues to rely on significant voluntary community support to assist in the care and maintenance of reserves throughout the State. The importance of Para Wirra to the local community has generated a base of community support. Community assistance will continue to be of great value in maintaining acceptable standards of management.

Actions

The Service will encourage members of the local community, through the Para Wirra Friends Group, to become involved in tree planting, walking track design and layout, weed control and other management tasks.

Other groups and individuals interested in volunteering their skills and labour will be invited to initiate and participate in activities and projects that are consistent with park management objectives.

OBJECTIVE 8

Develop constructive working relationships with neighbouring landowners, government agencies and local councils to address joint management issues where appropriate.

Background

Para Wirra Recreation Park borders on agricultural land, residential land and land administered by the Engineering and Water Supply Department, and the Woods and Forest Department. Many of the recreation and land management issues addressed in this plan of management are shared by surrounding landowners and management authorities.

The formation of a Consultative Committee on weed control in 1987, consisting of representatives of the Department of Agriculture, local councils, Engineering and Water Supply Department, Woods and Forest Department, and the National Parks and Wildlife Service, is consistent with the objective of developing constructive working relationships with surrounding landowners. Similarly, the Natural Resources Management Advisory Committee set up in February 1989, consisting of National Parks and Wildlife Service, Woods and Forest Department, and Roseworthy College representatives, is a further realisation of this objective.

The National Parks and Wildlife Service and the Woods and Forest Department have also been working in co-operation with the Animal and Plant Control Commission to control feral goats in the Barossa region.

Action

Liaison with surrounding land management authorities should be maintained and fostered to effectively address joint management issues and assist in the management of Para Wirra Recreation Park, where such liaison is appropriate.

OBJECTIVE 9

Protect sites of historical interest in the reserve.

Background

There are no known sites of Aboriginal cultural significance in Para Wirra Recreation Park, although future research may reveal such sites. There are however, sites of European cultural significance.

Para Wirra was mined for gold during the 1860s, 1890s and depression years. There are mine shafts, adits, remnants of dwellings and battery foundations remaining from this era.

Fencing has been erected to address the public safety issues posed by the open mine shafts and adits. To give this management approach legislative force, the shafts and adits have been gazetted prohibited areas under S.42 of the National Parks and Wildlife Act, 1972. A fenced access corridor through the main gold field in the north west corner of the park delineates an area of safe public access. Information signs provide visitors with information on the history, life style, geology and mining techniques of the period.

Actions

The structures put in place to make safe and interpret the gold mining area will be maintained.

The expertise of the Heritage Branch of the Department of Environment and Planning and the Department of Mines and Energy has been sought to advise on the management and protection of sites of historical significance.

OBJECTIVE 10

Acquire land to consolidate boundaries, protect habitat or features of scientific, geological or historical interest.

Background

The National Parks and Wildlife identifies the incorporation of representative landscapes, plant and animal associations and features of historical significance within the reserve system as an important objective.

Areas can be nominated for acquisition from within the Service or from outside the Service. Areas nominated for acquisition may be private land, unallotted Crown land, specific use reserves or leasehold land.

Areas nominated for acquisition are evaluated in the context of existing reserves and other proposals, according to Departmental procedure. The criteria used to determine land acquisition priorities are as follows:

- (1) the preservation of a viable representative sample of environmental associations,
- (2) the protection of endangered, rare and unique plants and of areas containing habitats for uncommon or particular wildlife species,
- (3) the preservation of wetland areas,
- (4) the preservation of extensive natural areas,
- (5) the protection of significant features,
- (6) the provision of aesthetic/recreation areas,
- (7) the provision/protection of tourist areas,
- (8) enhancing the viability of existing reserves,
- (9) the provision of link corridors,
- (10) boundary rationalisation.

Actions

Parcels of land nominated for acquisition will be considered and assessed according to statewide priorities and assessment criteria. Purchase would be subject to available finance.

OBJECTIVE 11

Provide information, education, interpretive services and promotional materials to enhance visitor enjoyment and awareness.

Background

The Para Wirra visitor survey suggests that the park's natural environment and scenery are greater attractions than the park's built facilities, and that walking is the single most popular recreational activity (Suter, 1990). The survey also identified the necessity to improve interpretation and visitor information services.

The Para Wirra Study Centre plays a valuable role in educating students of the northern metropolitan area about the natural environment and the role of the National Parks and Wildlife Service.

Built in 1970 by four northern metropolitan area secondary schools, Craigmore, Elizabeth West, Gawler and Smithfield Plains, the objectives of the Study Centre are to:

- enhance classroom learning through outdoor activities,
- provide an educational resource which is not available in the urban environment,
- provide an outdoor situation conducive to co-operation, communication and personal development through social interaction,
- provide a facility which encourages the development of skills and interests useful in later life,
- provide an opportunity for the students to recognise their involvement in, and responsibility for, the natural environment.

Management of the Study Centre is co-ordinated by a management committee consisting of 2 staff from each member school, a project co-ordinator appointed by the Education Department, and a National Parks and Wildlife Service representative.

The negotiated terms and conditions pertaining to the use of the Study Centre are specified in a letter of agreement between the Department of Environment and Planning and the Education Department.

Actions

High priority will be given to improving sign posting on walking trails.

As resources permit interpretive and information services will be upgraded with an emphasis on the natural environment and the heritage values of the park.

The recreation opportunities, natural history and heritage values of the park will be promoted to residents of the northern suburbs, community groups and special interest groups.

The National Parks and Wildlife Service will continue to support the Study Centre Concept subject to negotiated terms and conditions of use of the reserve for this purpose. A National Parks and Wildlife Service representative will attend management committee meetings on a needs basis and will work in co-operation with the co-ordinating management committee and the Education Department appointed project officer.

The conservation values and recreation facilities will be promoted to the South Australian community.

ACTION SUMMARY

This section provides a summary of the key management proposals outlined in this plan.

Project	Priority	Duration
Provide opportunities for a range of recreational activities consistent with management objectives	High	Ongoing
Control weeds/vermin and manage wildlife	High	Ongoing
Draw up and implement fire suppression plan	High	Ongoing
Observe the zoning plan and design any developments in sympathy with conservation and landscape values	High	Ongoing
Use lease fees and concession operations to provide visitor services	Moderate	Ongoing
Encourage community involvement in the maintenance of the park	Moderate	Ongoing
Develop constructive working relationships with neighbours and other resource management authorities	Moderate	Ongoing

Project	Priority	Duration
Protect historical features within the reserve	Moderate	Ongoing
Acquire land to rationalise boundaries, protect habitat, features of historical and geological significance	Moderate	Ongoing
Provide information and interpretive service to park visitors	Moderate	Ongoing

APPENDIX A

FLORISTIC CODE (ATT2 CODE) AND DESCRIPTION

FLORISTIC CODE (ATT2 CODE)	VEGETATION ASSOCIATION
2	1.2 WOODLAND <i>Eucalyptus obliqua/Eucalyptus goniocalyx</i> <i>Daviesia ulicifolia/Lomandra fibrata</i>
3	1.3 LOW WOODLAND <i>Eucalyptus fasciculosa/Eucalyptus goniocalyx</i> <i>Acacia paradoxa/Acrotriche depressa</i>
4	1.4 LOW WOODLAND <i>Eucalyptus fasciculosa/Eucalyptus goniocalyx</i> <i>Goodenia primulacea/Drosera whittakeri</i>
5	2.1 LOW WOODLAND <i>Eucalyptus fasciculosa/Allocasuarina</i> <i>verticillata</i> <i>Scaevola albida/Cheilanthes austrotenuifolia</i>
6	2.2 LOW WOODLAND <i>Eucalyptus fasciculosa</i> <i>Hakea rostrata/Xanthorrhoea semiplana</i>
7	2.3 LOW WOODLAND <i>Eucalyptus fasciculosa/Callitris preissii</i> <i>Dodonaea viscosa/Hakea rugosa</i>
10	2.6 LOW WOODLAND - HEATH <i>Eucalyptus fasciculosa</i> <i>Acacia paradoxa/Xanthorrhoea tateana</i> <i>Drosera whittakeri</i>
22	6.1 WOODLAND <i>Eucalyptus leucoxylon/Eucalyptus fasciculosa</i> <i>Eucalyptus odorata</i> <i>*Ehrharta longifolia</i>
23	6.2 WOODLAND <i>Eucalyptus fasciculosa/Eucalyptus leucoxylon</i> <i>Hibbertia riparia/Gonocarpus elatus</i> <i>Cheilanthes austrotenuifolia</i>
25	7.1 WOODLAND <i>Eucalyptus camaldulensis/Eucalyptus</i> <i>leucoxylon</i>

**Anagallis arvensis/*Linium trigynum*

- 26 7.2 WOODLAND
Eucalyptus camaldulensis
Acacia verniciflua/Bursaria spinosa
Callistemon paludosus
- 28 8.1 WOODLAND
Eucalyptus leucoxylon/Eucalyptus viminalis
Scaevola albida
- 33 9.1 OPEN FOREST
Eucalyptus obliqua
**Rubus ulmifolius*

NOTE:

1.2 WOODLAND

*Eucalyptus obliqua/Eucalyptus
goniocalyx*

*Daviesia ulcifolia/Lomandra
fibrata*

refers to structure class
refers to dominant overstorey
species
refers to indicator species
which **may or may not** be
dominant for the given
floristic class

an asterisk (*) indicates an exotic/introduced species.

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