

# DANGGALI CONSERVATION PARK MANAGEMENT PLAN

MURRAYLANDS

SOUTH AUSTRALIA



National Park and Wildlife Service  
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES





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**This plan of management has been prepared and  
adopted in pursuance of section 38 of the  
National Parks and Wildlife Act, 1972-81**

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Front page Photographs (top) Morgan Vale Homestead Implement Shed  
(bottom) Hypurna Landsystem

Photography by Mate Osborne

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# **FOREWORD**

This document is the management plan for Danggali Conservation Park and has been adopted pursuant to the National Parks and Wildlife Act 1972. The draft was released for public comment and seven public submissions were received and have been taken into consideration in the preparation of this plan.

The Park is located in the Murraylands Region of the Department of Environment and Natural Resources, approximately 70 km north of Renmark. The Park is important for the conservation of rare plants and animals of the region and has low to moderate visitation.

This Plan outlines proposals to effectively conserve the natural and cultural values of the Park while allowing moderate visitation to occur.

The Berri office of the Department of Environment and Natural Resources maintains records and resource information on the Park. This information can be accessed by the general public.

David Wotton

MINISTER FOR THE ENVIRONMENT AND NATURAL RESOURCES

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# 1 MANAGEMENT CONTEXT

## 1.1 Conservation Parks in South Australia

The classification which a reserve receives on being dedicated under the *National Parks and Wildlife Act, 1972* (NPWA) is a general statement of the purpose for which that area of land was acquired. Conservation parks are lands that should be protected or preserved to conserve wildlife, natural or historic features which they contain.

Conservation is part of a regional pattern of land use. Other land uses such as agriculture, forestry and mining are distinguished by community acceptance of environmental modification. The management of NPWS reserves aims to minimise disturbance to natural and cultural resources while providing for public use and enjoyment, and is a significant component of regional land use.

## 1.2 Location and Regional Context

Danggali Conservation Park is located 70 km north of Renmark, within the DENR Murraylands Region (Figure 1). The Park covers an area of approximately 253 380 ha, and comprises of pastoral blocks 731, 1470 and 1488, North out of Hundreds, Chowilla, County of Hamley and pastoral block 730, North out of Hundreds, Chowilla.

In 1975 Federal funding was made available to purchase four adjoining pastoral properties, Canopus, Morganvale, Hypurna and Postmark. These were combined to form Danggali Conservation Park, which was dedicated in 1976.

This extensive park lies in the northern half of the Murray Basin, adjacent to the New South Wales border. The landscape is one of gently undulating recent sand dunes overlying ancient dunes. The Park encompasses an interesting vegetation gradient, and contains a number of plant species at the limit of their range. The area is also a good bird and macropod habitat, and harbours a diversity of other vertebrates.

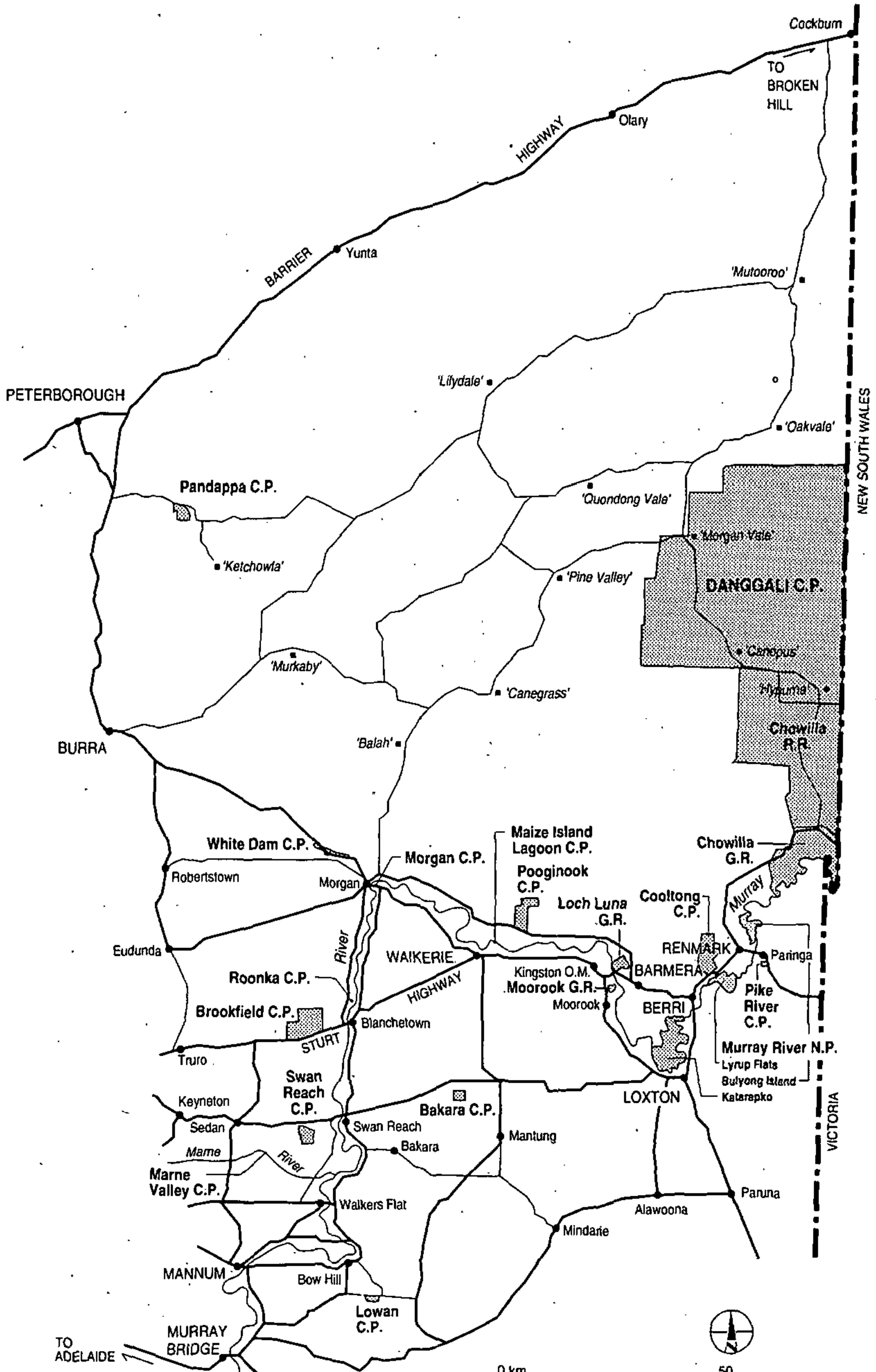
Danggali Conservation Park is the only State reserve in the Canopus, Pine Valley, Gairloch Dam, and Hypurna Environmental Associations (Laut et al. 1977). The vegetation protected by the Park represent the largest remaining sample of these Environmental Associations.

Interest in the Park is mainly to observe the fauna, flora and historical sites it contains. Visitors often camp in the Park or use the Canopus Shearers quarters.

## 1.3 Biosphere Status

Danggali was dedicated a Biosphere Reserve in 1977 under the Man and the Biosphere program established by UNESCO. Biosphere reserves have a three faceted role: conservation, research and sustained development. The principal document guiding the establishment of the international biosphere reserve network is the Action Plan for Biosphere Reserves, which was adopted by UNESCO in 1985. The Action Plan lists the following objectives:

- to enhance the role of the international network of biosphere reserves in global ecosystem conservation;
- to improve and upgrade the management of existing and new biosphere reserves to correspond with their multi-purpose objectives;
- to promote the conservation of key species and ecosystems in biosphere reserves;



- Sealed Road
- - - Unsealed Road
- N.P. National Park
- C.P. Conservation Park
- G.R. Game Reserve
- R.R. Regional Reserve

0 km 50

**Figure 1**  
**Danggali Conservation Park**  
**Location Map**



- to promote coordinated research projects on conservation science and ecology within biosphere reserves;
- to develop monitoring activities in biosphere reserves in order to provide a basis for scientific research and management activities and contribute to the understanding of environmental change;
- to enhance the role of biosphere reserves in regional planning and development;
- to promote local participation in the management of biosphere reserves;
- to promote environmental education and training related to biosphere reserves and to use the full potential of the reserves for these purposes; and
- to use fully the potential of the network to generate and spread knowledge about the conservation and management of the biosphere and to promote the biosphere reserve concept through information and demonstration.

#### **1.4 Objectives of Management**

The *National Parks and Wildlife Act, 1972* describes the general objectives of managing conservation parks in South Australia as:

- preservation and management of wildlife;
- preservation of historic sites, objects and structures of historic or scientific interest;
- preservation of features of geographical, natural or scenic interest; destruction of dangerous weeds and 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; and
- generally the promotion of the public interest.



## 2 PARK DESCRIPTION

### 2.1 Climate

The Murraylands area has a climate with cool winters and warm to hot summers. Diurnal and seasonal temperature variations can be significant, and because the area is in the rain-shadow of the Mount Lofty Ranges, it is considered within the southern-most extension of the arid zone in South Australia. The Park is situated between the 200 and 250 isohyets with rainfall varying considerably from year to year and across the park. Records since 1948 show that at Canopus the annual rainfall has varied from 112 mm (1977) to 564 mm (1993). Evaporation is very high during summer months, and the average monthly evaporation exceeds the rainfall in every month of the year.

### 2.2 Landforms and Soils

Laut et al. (1977) place the Park in the South Olary Plains Environmental Region of the Eastern Pastoral Province. The Park contains small portions of Pine Valley, Gairloch Dam, and Hypurna Environmental Associations, and the bulk of Canopus Environmental Association. Canopus Environmental Association is characterised by gently undulating plains with widespread easterly running dunes and occasional claypans. The soil parent material consists of clayey deposits overlain to varying depth by windblown sandy deposits. The depth of sandy material overlaying the clayey materials has a considerable influence on the vegetation type. The vegetation is predominantly open mallee scrub on the dunes, mallee scrub, blackoak woodlands and various types of shrubland (eg *Eremophila*, *Acacia*) on the plains and low open chenopod shrubland on the pans.

### 2.3 Vegetation (Landsystems)

Seventy two percent of the Park is within the Lowan landsystem (Figure 2). This system is characterised by low, discontinuous sand dunes with narrow, sandy swales supporting mixed mallee open-scrub with summer red mallee (*Eucalyptus socialis*) and white mallee (*E. dumosa*) common and ridge-fruited mallee (*E. incrassata*) and porcupine (*Triodia irritans*) found on taller dunes exist. Other understory species are tarbush (*Eremophila glabra*), pituri (*Duboisia hopwoodii*), pale turpentine bush (*Beyeria lechenaultii*), rough halgania (*Halgania cyanea*) and stiff westringia (*Westringia rigida*). In the areas burnt in the major fires during 1984/85 stands of sand pine (*Callitris verucosa*) and desert poplar (*Codonocarpus cotinifolius*) exist.

The second largest Landsystem, within the Park is Hypurna (25 percent) characterised by calcareous plains and scattered low dunes with black oak (*Casuarina cristata*), low open-forest and a diverse, often dense shrub understory including bullock bush, (*Alectryon oleifolius*), quandong (*Santalum acuminatum*), narrow-leaf hopbush (*Dodonaea viscosa ssp angustissima*), bean bush (*Senna filifolia*) and chenopods (bluebushes, saltbushes and copperburrs).

The remainder of the park is divided up into three other landsystems Pine Valley, Jack Hall and Borehole (Figure 2). The Pine Valley landsystem is characterised by Calcareous plains with pearl bluebush (*Maireana sedifolia*) interspersed with black oak woodland on low dunes.

The Jack Hall landsystem comprises of gently undulating calcareous plains and run-on areas with pearl bluebush and blackbush (*M. pyramidata*) low shrubland, interspersed with clay depressions with spotted emubush (*Eremophila maculata*), nitre bush (*Chenopodium nitrariaceum*) and thorny fan-leaf (*Selenothammus squamatus*). The Borehole landsystem comprises of low discontinuous sand dunes with summer red mallee and white mallee open scrub and wide swales with sugarwood (*Myoporum platycarpum*), open woodland and scattered groves of red mallee (*E. oleosa*), white mallee and black oak.

True arid region species mulga (*Acacia aneura*) and nealie (*A. loderi*) are present in the park at scattered locations. As the vegetation in this area represents a transition from one type to another, some plant species are at or near the northern limit of their distribution (such as sand pine and pale turpentine bush, while others are at or near their southern limit (such as pituri, and mulga).

Other species of interest are the river box (*E. largiflorens*), which occurs well away from its preferred habitat in water courses, and nealie, which is closely related to western myall (*A. papyrocarpa*) which occurs on the western side of the Flinders Ranges. It is thought that these two *Acacia* species had a common ancestor which took refuge in the Flinders Ranges during a Pleistocene arid climatic phase. As the climate improved the ancestor left the Ranges and occupied the plains on either side, subsequently evolving into two separate species. Whereas western myall is widespread in the north west of the State, nealie is confined to Danggali Conservation Park and western New South Wales.

## 2.4 Native Animals

Numerous fauna and flora surveys have been conducted in the Park (S.A. College of Advanced Education 1986, 1988, 1989, 1990 and University of S.A. 1991 & 1992) resulting in nineteen native mammals and five introduced species recorded. Both the red kangaroo (*Macropus rufus*) and the western grey kangaroo (*Macropus fuliginosus*) occur in the park with density since 1982 ranging from 2 to 14 per square km. A small scattered population of euros (*Macropus robustus*) also occur in this area.

The Short-beaked echidna (*Tachyglossus aculeatus*) has been observed on the Park, and this area is one of the few where the fat-tailed dunnart (*Sminthopsis crassicaudata*) is relatively common. Other significant species in the Park are the little pied bat (*Chalinolobus picatus*), greater long-eared bat (*Nyctophilus timoriensis*), sandy inland mouse (*Pseudomys hermannsburgensis*), Yvonne's Ningau (Ningau *yvonneae*) and Stripe-faced Dunnart (*S. macroura*).

A diverse range of reptiles are known to exist in the Park with 50 species so far being recorded which include Burton's snake-lizard (*Lialis burtonis*), mallee dragon (*Ctenophorus fordi*), broad-banded sand swimmer (*Sphenomorphus richardsonii*), and yellow-faced whip snake (*Demansia psammophis*).

The lower north-east pastoral zone is of special importance for some bird species, particularly the scarlet chested parrot (*Neophema splendida*) and major mitchell cockatoo (*Cacatua leadbeateri*) are both vulnerable species. The abundance of large mallees and black oaks in the park provide essential nesting hollows for these birds. The black oak areas in the Park are a extensive breeding ground for the apostle bird (*Struthidea cinerea*) in South Australia.



In addition, the southern population of the striated grass wren (*Amytornis striatus*) present in the Park is a morphologically distinct outline, and constitutes the northern most limit of the southern type of striated grass wren.

Over 138 bird species have been recorded on the Park, including the endangered Mallee Fowl (*Leipoa ocellata*) and the vulnerable Regent Parrot which move onto the park in the non breeding season. Species commonly seen on the park include Wedge-tailed Eagle (*Aquila audax*), Mallee Ringneck (*Barnardius zonarius*), Red-capped Robin (*Petroica goodenovii*), Rufus Whistler (*Pachycephala rufogularis*), Crested Bellbird (*Oreoica gutturala*), Chestnut-crowned Babbler (*Pomatostomus ruficeps*) and Singing Honeyeater (*Lichenostomus virescens*).

## 2.5 Pest Animals and Plants

Animal pest species present in the Park include goats (*Capra hircus*), cats (*Felis domesticus*), foxes (*Vulpes vulpes*), rabbits (*Oryctolagus cuniculus*) and house mice (*Mus musculus*). Weed species are common along roads and around dams and building sites. On the less sandy soils, weeds seem to be common under trees and shrubs that provide good shade. Stock and possibly kangaroos using these for shade have possibly contributed to the spread of weeds. Some weeds, particularly Ward's weed are widespread.

## 2.6 Fires

Few records have been kept of fires in the Park prior to Government purchase; however, extensive areas appear to have been burnt during this century. Local people recall big fires in 1917 and the late forties. Almost all the recent fires have started by lightning strikes during dry thunderstorms. Many of these fires have not spread because fuel loads were low, and weather conditions were mild. Larger fires occur in years of high rainfall, when spear grass is abundant. During 1984/85 four major fires started resulting in approximately 56,700 ha. of the north-western section of the park being burnt. Two research studies into the effect of wildfire on the vegetation of the park have occurred following these major fires; Donovan (1990) and Morelli (1990).

## 2.7 Culture History

### 2.7.1 Aboriginal

N.B. Tindale (1974) attributes traditional Aboriginal occupation of the land to the Danggali Tribe who inhabited a vast area of the plains southwest of Broken Hill. Various early explorers and settlers have described their presence and customs during the relatively brief period of European settlement. Nanya's group of Aborigines occupying the area around the turn of the century, have been identified by Tindale as probably of the Danggali Tribe. However, limited evidence of Aboriginal occupation has been recorded in the area. Flint and stones have been observed around old clay pans but no systematic survey has been undertaken to date. Nanya's wurley, constructed from black oak, was discovered by Ray and Howard Martin in 1922. The wurley is located about 6 km from the Canopus homestead. According to local histories, Nanya fled troopers in 1864 following his murder of a fellow Aborigine at a droving camp in the Darling Downs.

There is an account of Nanya being sighted in 1884 by a Tom Mullens at Oakvale Station. Nanya, two women and their children were made the subject of a man hunt in the mid 1890 by a man called Whiteman who offered his stockmen 100 pounds reward if they captured the elusive Aborigine. In the ensuing hunt, Nanya's 'tribe', by then numbering about 30, were terrorised and injured. They were eventually captured in 1894 and taken to Urntah Lagoon where their numbers dwindled. Nanya was taken to the 1895 Exhibition in Adelaide and died shortly afterwards. His descendants were dispersed and the last, William McKenzie, died in Queensland in the early 1960s.

### 2.7.2 Pastoral

Pastoral occupation in the region dates from the 1850s, when Charles J.F. Campbell held 931 square km (361 sq miles) on his North West Bend Station. The station stocked 14,000 sheep, 300 cattle and 90 horses at the time of his death in 1859. According to Pastoral lease records, Alexander Hay took up 2,849 square km (1,000 sq miles) at North West Bend in 1875, joined by Charles Henry Armytage in May, 1876. By 1896 it was noted that the lessees did not intend to occupy at the expiration of the lease but would accept commonage at the usual rates. Other lessees of land in Danggali include:

- 1) W. & H. Brook (Pastoral leases 2461 and 2462) who leased land north of the North West Bend Station between 1875 and 1896.
- 2) J. Chambers (P.L.O. 2235) who leased "Boundary" run, S.E. of Hay's "North West Bend" property, an area of 259 square km (100 sq miles) during the 1870s.
- 3) Adrian Morris Wooldridge (P.L. 2377) who leased 259 square km (100 sq miles) in 1874.

During the period between the 1870s and 1896, the lessees changed. Improvements to the runs in the form of fences, wells, stock yards and huts were erected from local timber and supplies of wire and corrugated iron brought by river transport or across the eastern plains from Burra.

Early pastoralism was subject to the severe drought of the mid 1860s. One example of the type of loss suffered by lessees was the loss of 15,782 sheep belonging to Mr. Armytage. In 1865 the lambing season yielded 1 lamb and in 1866 none. However, by the time the North West Bend property transferred to the Hon. Alexander Hay in 1875, the stock included 94,000 sheep, 500 cattle and 300 horses.

In 1894, Alexander Hay surrendered the western portion of his lease. Improvements on the land retained included 5 huts, and one house. The impact of drought and depression at the close of the nineteenth century resulted in surrendering and non-renewal of pastoral leases during the 1890s.



Land was taken up again on new Pastoral leases after the turn of the century, with a process of amalgamation and division of leases reflecting adjustments found to be necessary by land holders. The following is a brief account of the four pastoral holdings and their history up to the time when reverting to the Crown:

### Canopus Station

Harry Benson Martin acquired a variety of different sized Pastoral Leases offered early this century, following surrender and non-renewal of earlier leases over the same land in the 1890s. "Postmark, South East of the N.S.W. border" was first leased this century to Samuel Pope, from Overland Corner.

Following Pope's surrender of the lease in 1909, Harry Benson Martin, a butcher and farmer of Berri, and William Crozier, a butcher of Renmark, took up the lease. Martin subsequently bought out Crozier's share and also acquired a number of other land parcels. Around 1918 or 1919 'Canopus' was adopted as the property's name, following a suggestion by the Government Surveyor who surveyed the area with the aid of the star. Canopus was then purchased by William Snell in 1955, who held it to 1976 when it was purchased by the Government. In the interim, the Martin family improved the property with the construction of shearing shed, shearing quarters, over 800 km of fencing, dams and the sinking of wells. The neighbouring Morganvale Station was incorporated into the Canopus Station in 1960.

### Morganvale

In 1904 a lease over the area was briefly taken up by George Kidman, but did not form part of the Kidman "empire" as it was surrendered in the following year. During 1906, four brothers from Burra took up the lease. They were Herbert, William, George and Edward Morgan. The original homestead building at Morganvale, so named by the brothers, is believed to have originally been the nurses quarters at the Burra Hospital.

While it is unconfirmed whether the homestead was the nurses quarters or not, its appearance suggest the late Nineteenth Century period. The timber frame corrugated iron building has 3 main rooms, with skillion roof additions at the rear and a verandah of timber posts along the western aspect of the building. An additional rear room built of local stone and mortar has since collapsed. Shutters on the northern side window and verandah fascia boards have *deteriorated*. *Interior rooms feature finely fluted corrugated iron walls and high ceilings*. The wooden floors show signs of decay and sections have collapsed.

A short distance away from the original Morganvale homestead is a cluster of buildings, including staff quarters, outbuildings and implement sheds. These date from 1930 to 1950. In 1928, after a slump in the price of wool resulting in a decrease in sheep on the land, the property was sold to Guilford Murray Howard for 11,000 pounds. Howard built a homestead around 1929-30, which was burnt in 1966. A concrete slab and two chimneys mark where the building once stood.

The property ran between 2,000 and 6,000 sheep depending upon the price of wool and climatic conditions. In 1954 the Heinrichs purchased the property. During this period the property ran about 12,000 head of sheep, double the estimated carrying capacity of the land. Following Heinrich's untimely death in 1958, Elder Smiths placed the property up for sale in 1960. William Snell, of the neighbouring Canopus Station, bought the property and incorporated it into his holding until it was sold to the Government in 1976.

### Hypurna

Chamber's 1872 lease was held by him until 1895, when it was taken over by 3 Adelaide women, Fanny Weaver, Priscilla Bickford and Ella Lucas. The latter group did not hold the lease for long. After 1915 Ernest William Castine ran the property for the next 20 years, and named it the Swastika Station. Castine was responsible for most of the long narrow dams on the property. The existing station buildings were erected in the 1940s, after the lease transferred in 1934 to John J. Higgins, Alexander L. Higgins, Hurtle M. Higgins and James G. Higgins of New South Wales. John Higgins managed the property and installed an air strip. In 1958, the property was transferred to John Thomas Higgins and Alexander L. Higgins. After subsequent ownership by L.G. Martin and his wife, Ellen Lucy, the property transferred to the Gilfillans of Tarlee, who finally sold the property to the State Government in 1975. Swastika Station became Hypurna Station during World War II.

### Postmark Station

Located in the North East corner of Danggali Conservation Park, Postmark Station appears on the Pastoral Plan of 1900, 259 square km (100 sq miles) having been taken up by the Tiver brothers from Aberdeen in Burra between 1900 and 1903. In 1934 the station was purchased by Oakbank Limited and incorporated into the neighbouring station's holdings until 1976, when it was sold to the State Government.

To survive in this area pastoralists needed water. As bore water is approximately 150m below the surface and extremely salty, 66 dams were constructed on the four properties between 1915 and 1960. Construction techniques involved oxen, horses, tractors and bulldozers. The nature of the soil and a high evaporation rate resulted in many of the dams proving inefficient stock water, however many of the dams hold water for a significant portion of the year.

## **2.8 Visitor Use**

Visitor numbers are low to moderate and due to the hot summer months, visitation occurs mainly during the cooler months of the year. Bush camping is restricted to the two camping areas near the Canopus homestead. The Canopus shearers quarters are available for rent to groups of park visitors. The main visitor activities are observation of the parks flora and fauna, visiting the historical sites and relaxation in a remote location.

Due to the wilderness qualities of the park and for visitor safety, historically visitor access has been restricted to the southern portion of the park.



## 3 MANAGEMENT PRESCRIPTION

Policies for the management of the Park, summarised below, have been developed within the constraints of:

- the *National Parks and Wildlife Act, 1972* and Regulations;
- State Government policy;
- Department of Environment and Natural Resources policies; and
- community attitudes and expectations at state, regional and local levels.

### 3.1 Natural Resources

#### 3.1.1 Fauna and Flora

Danggali represents an excellent sample of semi-arid vegetation communities. The basis of flora and fauna management for the Park is to conserve the area for maximum diversity of naturally occurring species and communities.

Due to the large size (up to 47,000 ha.) of undisturbed blocks of vegetation the park possesses wilderness qualities

A network of photopoints has been established in the Park over the last 15 years. This program will be maintained and may be increased if resources permit.

Two remnant plant species mulga and nealie are present in the park at scattered locations. To assist in recruitment of young plants exclosures have been placed around small populations of mulga. It is proposed to implement a similar action for nealie.

A kangaroo ground survey is conducted each autumn and spring. Monitoring of other species, especially those that are rare or endangered (such as mallee fowl), will be undertaken by DENR when possible.

A pest plant management program for the Park will be developed and implemented. Pest plant control over such a vast area is impractical at this stage, however infestations will be recorded and monitored. Although pest plants are present in the Park, they are largely confined to tracks, dams and homestead areas.

Animal pest species include rabbits, cats, foxes and goats. Due to unsuitable habitat rabbit numbers have been historically low, accordingly fox and feral cat populations are also relatively low and require no specific control program at this stage. Goats, however, are a pest species which pose a significant conservation threat to the Park, and require active, ongoing control.

Goat numbers have been high for several decades. Much park staff time is taken up with goat control. Since the Park was dedicated, over 45 000 goats have been destroyed on or removed from the Park. The DENR will continue to destroy goats both opportunistically, and as part of a planned control program. Neighbouring property holders will be encouraged to control goat numbers on their properties, and to maintain fences to restrict passage.

The following strategy on artificial water in the Park is an preliminary approach and will be reviewed in a regional context when the Bookmark Biosphere Reserve action plan is developed.

A large percentage of the 66 dams in the park hold water for extended periods. Artificial water supplies in the Park provide a year round water source for native wildlife, goats, human habitation, visitors and fire fighting. In an attempt to assess the influence of artificial water supplies on the Park, figure 2 shows the 2 km piosphere around reliable dams, as a primary assessment of grazing pressure around each dam.

Table 1 describes the effects of the 2 km piosphere has around reliable dams as per landsystems.

**Table 1 Effects of 2 km piosphere around reliable dams on Park landsystems.**

<b>LANDSYSTEM</b>	<b>TOTAL AREA</b>	<b>AREA EFFECTED BY PIOSPHERE</b>	<b>PERCENTAGE EFFECTED BY PIOSPHERE</b>
Hy. Hypurna	64530	12697	19.7%
Lw. Lowan	182976	20498	11.2%
Bh. Borehole	230	91	40%
Pv. Pine Valley	4355	2141	49%
Jh. Jack Halls	1289	1099	85%
<b>TOTAL</b>	<b>253380</b>	<b>36526</b>	

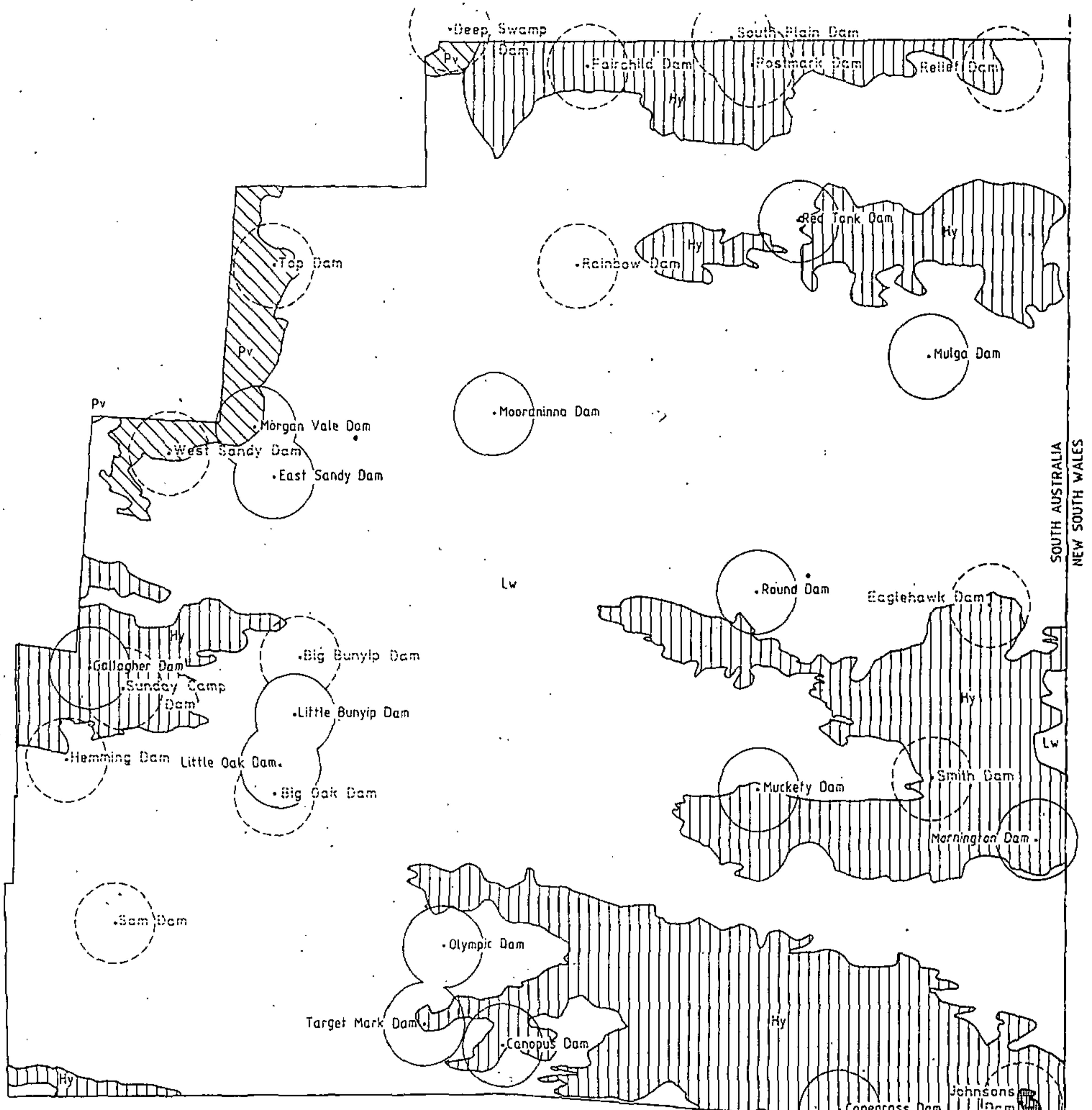
Due to the high impact artificial water has on the Borehole, Pine Valley and Jack Halls landsystem, the following dams will be given highest priority subject to availability of resources to be filled in and revegetated; Nanya, West Sandy and Johnsons. Due to access difficulties and to aid goat control, Sams, Hemmings, Rainbow and Eaglehawk dams will also be given priority for rehabilitation.

Eighteen of the dams are required for management or visitor enjoyment purposes: six will be maintained as a water source for fire-fighting in high fire risk areas of the Park (Moorinenna, Muckety, Red Tank, Galliaqhers, Mulga, Top). Five will be retained for domestic use (Canopus, Target Mark, Olympic, Hypurna, and Coombs), and seven will offer visitors the opportunity to observe wildlife (Mormington, Cane Grass, Round, Little Oak, Little Bunyip, Morgan Vale, East Sandy).

Of the remaining 41 dams, eight have a reliable water supply and subject to available resources will also be filled in and revegetated. This will aid goat control and will enable many minor tracks to be closed and rehabilitated. The remaining dams which are surplus to management requirements do not hold much water and will be allowed to deteriorate naturally.

Goat activity and grazing pressure around dams will be monitored and research into the effects of artificial water on the Park will be encouraged. Such monitoring and research may involve the establishment of exclosures. A trial exclosure will be established at Mucketty Dam to determine the value of this technique.





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NEW SOUTH WALES

### Land Systems

**Legend**

- Hy Hypurna Calcareous plains and scattered low dunes with black oak, low open-forest and a diverse, often dense shrub understorey including bullock bush, narrow-leaved hobbush, sennas and chenopods (bluebushes, saltbushes, bindlis).
- Lw Lowan Low, discontinuous sand dunes with narrow, sandy swales supporting mixed mallee open-scrub with summer red mallee and white mallee common and ridge-fruited mallee and porcupine grass found on the taller dunes.
- Bh Borehole Low discontinuous sand dunes with summer red mallee and white mallee open-scrub and wide swales with sugarwood, open woodland and scattered groves of red mallee, white mallee and black oak.
- Pv Pine Valley Calcareous plains with pearl bluebush, low dunes with black oak woodland.
- Jh Jack Halls Gently undulating calcareous plains and run-on areas with pearl bluebush and blackbush low shrubland. Clay depressions with spotted embush, nitre-bush and thorny fan-leaf.

- Round Dam- Dams to be maintained
- Top Dam- Other dams with a regular water supply

NOTE: Circle denotes 2km radius from dam

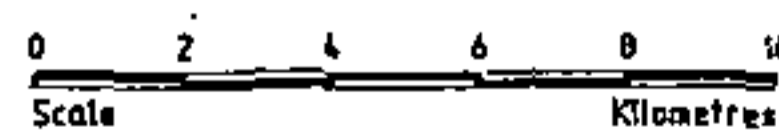


Figure 2

Danggali Conservation Park  
Grazing pressure around dams  
as indicated by 2km radius  
piospheres

The Park is fenced along its boundaries, and numerous internal pastoral fences remain. Maintenance of boundary fences, in cooperation with neighbouring property holders is a significant element in controlling goat and stock movement. Internal fences are of no real management value, and are gradually being removed. In some instances, where fences are considered of historic value, some posts will be left in place to indicate fence lines.

Dogs are not permitted on the Park, with the exception of departmental working dogs, utilised in the goat control program.

Action	Priority
• maintain photopoint network	High
• maintain mulga exclosure and establish nealie exclosure	High
• encourage research and monitoring of rare or endangered species to assist management decision making	High
• implement pest plant and goat control programs	High
• encourage investigation of requirements for the maintenance of native flora and fauna populations	Mod.
• develop a regional approach to artificial water supply through the development of the Biosphere Action Plan.	High
• prepare and implement prioritised list of dams and associated tracks to be rehabilitated	Mod.
• establish Mucketty Dam grazing exclosure	High
• maintain boundary fences in good repair	High
• remove internal fences as resources permit, leave indicative fence posts where appropriate	Low

### 3.1.2 Fire

Fire management will be in accordance with the DENR Fire Management and Protection Manual and the Park Fire Management Plan. See section 3.3.2 regarding solid fuel fires.

The Parks Fire Management Plan identifies the following fire prevention works and fire suppression strategies. Prevention works include:-

- a 20 metre wide fuel reduced zone has been established around the entire park boundary. It consists of at least a 3 metre wide clearing suitable for 4 W.D. vehicle access. The zone will be rolled or slashed as required however the need to maintain sections of the zone maybe reviewed on the completion of the vegetation map of the park and surrounding land.
- within the park 5 metre wide control lines have been placed along a series of existing tracks. This has divided the park into thirteen blocks ranging in size from 4,491 ha to 47,000 ha. On completion of the vegetation map of the park these control lines will be assessed for their suitability and future maintenance requirements.



- although the concept of prescribed burning should not be ruled out for ecological reasons, no areas are recommended for prescribed burning at this stage. Further research should be encouraged on the effects of fire on plant and animal species.
- in years of high fuel loads it might be necessary to slash or create graded breaks around Canopus and Hypurna homesteads and other park assets.
- the Canopus airstrip will be slashed regularly.
- DENR will endeavour to have on stand by at Canopus, a suitable bulldozer to be employed during the initial response to a fire.
- a 100 metre wide fuel reduced zone exists in N.S.W. along the eastern boundary of the park. Within the fuel reduced zone a 20 metre strip is maintained along the border fence.
- DENR staff will liaise with both the N.S.W. South West Mallee Bush Fire Prevention Scheme and the S.A. Country Fire Service.

Suppression Strategies include:-

- a direct attack on wild fires may be dangerous and ineffective in the park due to the lack of access tracks, dense vegetation, large distances and unpredictable local weather patterns, thus this option will apply adjacent to and in the following conditions:-
  - areas of fire sensitive vegetation. These include mature mallee with hollow trunks and branches (eg bull mallee).
  - man-made assets (houses, yards and other historical sites).
  - where in the opinion of the Incident Controller a small fire will build to un-containable proportions and there is a good chance of containing the fire. This should be based on forecast weather conditions for the next 24 hours.
  - Indirect Attack involves the use of pre-planned constructed or vegetation type (eg Black Oak) fire control lines. Appropriate back burning strategies will be employed from pre planned control lines. If other control lines are to be established along existing tracks within the larger management blocks, a bulldozer can be used, however disturbance to mineral earth should be kept to a minimum.

**Action**

- protect fire sensitive vegetation and man-made assets by controlling wildfire's
- maintain appropriate tracks for fire management access

**Priority**

High  
Mod.

### 3.2 Cultural Resources

A number of sites of archaeological or historical significance have been identified in the Park. Where sites or objects of archaeological significance are identified, they will be managed with regard to the views of Aboriginal people who have an affiliation with the area.

The majority of identified sites in the Park relate to the pastoral use of the area. Historic structures and artefacts are present at numerous sites throughout the Park. Some structures will be actively managed and maintained because of their historical value, others are still of practical use to Park management. The major items or precincts to be maintained and their proposed management regimes are outlined in the actions below.

A plaque has been erected near the Canopus homestead, commemorating the deaths of five people killed in a plane crash at this site.

<b>Actions</b>	<b>Priority</b>
• liaise with Aboriginal people regarding management of sites or objects of significance found in the Park	Mod.
• implement recommendations of Historic Sites Survey as appropriate, principal considerations are:	Mod.
• Canopus homestead precinct - the buildings in the homestead area will be maintained for their historic value and for management purposes (this site is the Park Headquarters, park manager's residence, and park operational base);	Mod.
• Canopus shearers' quarters precinct - these buildings are suitable for accommodation of visitors to the Park (such as education or research groups, and fire fighters), and will be maintained in habitable condition;	Mod.
• Canopus shearing shed precinct - the shearing shed and yards are of substantial historic and aesthetic value and will be maintained;	Mod.
• Canopus charcoal pit - this unusual brick and iron structure will be stabilised and protected from further damage or degradation;	High
• Canopus landing strip - will be maintained for management and emergency aircraft access;	
• Canopus turkey nest dam - an uncommon water storage structure, still in good condition, will be protected from fire and other damage;	Mod.
• Hypurna homestead precinct - the homestead and associate buildings will be maintained for management use;	High
• Nanya's wurley - although the wurley has largely collapsed it will be protected from fire and other damage;	Mod.
• South Oak ruins and Musterers Hut - although the structures at this site will not be actively managed, any historic artefacts scattered around these ruins may be collected and removed for display at one of the maintained historic sites;	Mod.



- Morgan Vale homestead precinct - all natural timber structures (fence-lines, yards, tank stands, implement sheds) will be retained and protected, all other buildings will be salvaged for building materials to repair other Park historic structures, or will be stabilised in a safe condition as a ruin; High
- Tipperary, Postmark, and Birthday Huts - will be stabilised and protected from further deterioration. High

### 3.3 Visitors

#### 3.3.1 Access

Most visitors gain access to the Park via Renmark and Chowilla Station, to the south of the Park (Figure 1). Smaller numbers of visitors use the western boundary entrance route which links to Morgan via Pine Valley Station. The main, southern access track follows the Chowilla pipeline route. The lessee's of Chowilla would prefer not to have these levels of vehicle pressure on the pipeline route. A preferred route is from the Wentworth road north to Canopus, via Calperum and Chowilla. Under the recent amendments to the Pastoral Land Management Conservation Act, 1989, public access routes over pastoral land must be defined (and all other routes used by permission of the lessee only). Route definitions is being done progressively throughout the State. When the Dangali region is being examined for public access route rationalisation, it would be appropriate to address the issue of establishing a new southern access route to the Park.

The Park has no formal walking tracks, and walkers tend to use vehicle access tracks. It is proposed to mark out at least one loop walking track in the vicinity of the Canopus homestead (Figure 3)

In providing public access, ecological and scenic values will be protected.

Figure 3 indicates walking tracks, public access tracks (2WD and 4WD), and management access tracks.

<b>Actions (see Figure 3)</b>	<b>Priority</b>
• maintain tracks as required for public access, management, and fire access	High
• close, and where appropriate rehabilitate, tracks not required for public or management purposes	Mod.
• provide and maintain signposted walking tracks in the Park	Mod.

#### 3.3.2 Camping and Recreation Activities

Recreation opportunities for public use and enjoyment of the Park will be provided which are consistent with the protection of natural features and processes, enhance appreciation and understanding of natural features, and complement recreation opportunities provided elsewhere in the region. Camping sites will be designated in the vicinity of Canopus Homestead. Individuals and groups which assist with Park research or management will be permitted to camp at other locations in the park designated by the Ranger In Charge. Camp fire wood fuel use will be managed to ensure conservation objectives are met.





Most visitors to the Park camp during their visit or stay in the Canopus Shearer's quarters. Visitors tend to use the Park for bird watching and botanising, or are visiting in transit to another destination. Few people camp on the Park during the summer months. Management issues associated with camping include protection of the native fauna and flora, fire risk, and track proliferation. Dead wood, both standing and fallen, provides important habitat for Park fauna, and upon decomposing returns nutrients to the soil. The removal of timber can have substantial long term impacts on the fauna and flora of the Park. These problems have negative impacts on the natural environment and the species and communities the Park was set aside to protect. Management efforts to mitigate these impacts will focus on educating visitors about the Park, its features and values, management objectives and appropriate behaviour (see Section 3.3.3).

In recent years interest by ecotour operators to place the Park on their itinerary has increased. In anticipation of the increased use by ecotourism of the park, programs should be established to limit impacts on the park and foster visitor appreciation of the Parks natural resources. An ecotour program should include:-

- education of tour operators and enlist their support in fostering appreciation of the Park's natural resources and engaging their clients in support of the development of a biological data base of the Park.
- allow accredited operators to use camping areas designated by the Ranger In Charge away from the main Canopus camping areas.
- establish wildlife survey sites for use by visitors to collect biological data.

**Actions (see Figure 3)**

- |   |                         |
|---|-------------------------|
| • camp sites will be designated at appropriate locations  | <b>Priority</b><br>High |
| • use of solid fuel fires will be restricted while the use of other fuel types will be encouraged | High                    |
| • establish an ecotour program to assist operators, visitors and the park.                        | Mod.                    |

**3.3.3 Interpretation and Environmental Education**

Interpretation and environmental education assist in protection of natural and cultural features and are major aspects of managing public use. There is a strong community expectation that information on Parks will be readily available. The Park has a role to play in the community as a resource for environmental study and education.

Interpretation and environmental education programs will seek to assist people to use and enjoy the Park, and to understand and appreciate its features and the Service's approach to management.

- |  |                 |
|--|-----------------|
| <b>Actions</b>   | <b>Priority</b> |
| • provide general information signs at appropriate locations                       | High            |
| • provide printed and sign-mounted information about the Park                      | High            |
| • if appropriate develop and provide, guided or self-guided educational activities | Mod.            |

### 3.4 Research, Inventory and Monitoring

The function of research is to assist in the understanding of resources, their use and effective management. Priorities for research are outlined throughout the Plan.

DENR will encourage suitably accredited groups or person to apply for scientific permits to undertake studies of the Park's natural and cultural resources.

Since 1986 the Conservation and Park Management course students from the University of South Australia (Salisbury Campus) have conducted yearly habitat assessment and monitoring projects throughout Danggali. Twenty four study quadrats have been established. Plant communities, soil types, avifauna, mammals, reptiles and invertebrates are surveyed and long term monitoring points established. DENR will continue to support and encourage the University of South Australia's assessment and monitoring program on the Park.

All research will be subject to DENR policy and procedure for the granting of scientific permits, the conduct of research and the forwarding of results to the DENR. Research applications will be granted only where the research has potential to facilitate management of the natural environment, and where the effect of the research on the natural and cultural features and visitor use of the Park does not conflict with the objectives of management

#### **Actions**

- encourage research which can facilitate better management by increasing the understanding of the requirements for the Park's ecosystem's
- support existing research programs and monitoring

#### **Priority**

Mod.  
High

### 3.5 Administration

#### 3.5.1 Minister for the Environment and Natural Resources

As a reserve established under the provisions of the National Parks and Wildlife Act, 1972, administrative responsibility for Danggali a Conservation Park rests with the Minister for the Environment and Natural Resources and, subject to delegation, the Chief Executive of the Department of Environment and Natural Resources and the Director of National Parks and Wildlife.

*Danggali Conservation Park lies within the Murraylands Region of the Department of Environment and Natural Resources which is administered from Berri. Day to day management of reserves in the region is undertaken by departmental staff in accordance with State Government and Departmental policies and according to the provisions of any approved plan of management.*

The National Parks and Wildlife Act enables the Minister to grant leases and licences for entry, use or occupation of reserves. At present no leases or licences have been granted, however potential for commercial ecotours exists.

Sections 45a - 451 of the National Parks and Wildlife Act provides for the establishment of Development Trusts for reserves. Such Trusts are considered to be a body corporate and:

- (a) are capable of suing and being sued
  - (b) are capable of holding, acquiring, dealing with and disposing of real and personal property
  - (c) are capable of acquiring or incurring other rights and liabilities.
  - (d) have powers, rights, duties, and functions conferred, imposed or prescribed by or under the National Parks and Wildlife Act or any other Act;
- and
- (e) hold property on behalf of the Crown

Development Trusts may also delegate powers, functions or duties to any committee appointed by it, or to any member of the Trust or officer or employee of the Trust.

In April 1993 the day to day decision making for Danggali Conservation Park was delegated to the Murraylands Conservation Trust, a 'Development Trust'. DENR is the operational arm of the Murraylands Conservation Trust and will organise and undertake park management programs.

The Department of Environment and Natural Resources has established a consultative network for each of its administrative regions and the Murraylands Consultative Committee provides a forum for community advice back to the Department of Environment and Natural Resources Murraylands Region. The Murraylands Consultative Committee presently comprises representatives from a variety of general and special interest groups including, Local and State Government representatives, landowners, conservation groups and educators.

The Murraylands Conservation Trust and staff of DENR will liaise with user groups, interested bodies and adjacent land holders on matters of mutual concern.

<b>Actions</b>	<b>Priority</b>
• utilise available permanent and casual staff to implement the fundamental provisions of this plan	High
• support the Murraylands Conservation Trust	High
• seek external funds from funding sources such as the Murray-Darling Basin Commission to enable completion of major projects which have a regional significance	Mod.
• maintain the Murraylands Consultative Committee as a forum for community consultation	High
• liaise with Government instrumentalities, adjacent land holders regarding matters of mutual interest	High
• utilise volunteers and interested groups where appropriate	High



### 3.5.2 Bookmark Biosphere Reserve

On the 21st December 1993 the Prime Minister announced that the Commonwealth would purchase Calperum Station, which adjoins Danggali to the south, in conjunction with the Chicago Zoological Society. This represented an extension of the Zoological Society's long-standing interest and involvement in research and conservation management in south Australia.

A month later at a public ceremony at Renmark which over 200, principally local guests attended, the Commonwealth Environment Minister and the South Australian Minister for Environment and Natural Resources indicated that the Calperum initiative signalled a new venture in cooperation for the conservation of biodiversity and the pursuit of ecologically sustainable development. They announced the establishment of a Biosphere Reserve (Bookmark) centred on Danggali/Chowilla and Calperum and a number of other reserves in the Riverland area.

The U.N.E.S.C.O. Man and the Biosphere program was launched in 1971 and was aimed to combine natural and social sciences in designing strategies to guide the rational use of natural resources. This awareness of the linkage between environmental conservation and socio-economic development culminated in the development of the Biosphere Reserve concept. It is an approach to conservation and sustainable use that has the potential of uniting the conservation efforts of the public and private sectors and contributing to the well being of the communities in which these reserves are established.

The Biosphere Reserve fulfils three main functions:-

- \* the conservation of species diversity.
- \* research, monitoring of the environment, education and recreation.
- \* to provide assistance in ecologically sustainable development in the surrounding regions.

The Biosphere Reserves consists of three regions or zones:-

- \* a core area subject to minimal human disturbance.
- \* a buffer zone where the emphasis is on the implementation of resource use strategies which minimise long-term dependency on those resources present in the core.
- \* transition area characterised as an area of active cooperation between reserve management and the local people, for promoting sustainable socio-economic development.

The Biosphere Reserve model offers something that few plans do:-

1. the success and future of the Reserve are in the hands of the local people.

2. there is commitment to management for long-term goals.
3. the intent to achieve intergenerational equity, that the next generation will not pay the debts of the present generation, is real.

Activities within the Biosphere Reserve are coordinated by the establishment of an Action Plan which is developed in conjunction with the community and the relevant land management agencies. The community based Murraylands Conservation Trust which has been established under the SA National Parks and Wildlife Act to manage the parks within Bookmark, will also coordinate management by the parties, of the Biosphere Reserve and to oversee implementation of the Action Plan. The Action Plan will be a dynamic document made up of a series of issue papers which will reflect relevant issues of common concern.

**Actions**

**Priority**

- through the Australian Nature Conservation Agency, liaise with Commonwealth agencies in preparation of a nomination to expand the present Danggali Biosphere Reserve and rename it "Bookmark". High
- maintain the Murraylands Conservation Trust as the peak body for day to day decision making and coordination High
- undertake the research, inventory and monitoring program as outlined in this plan High
- provide appropriate training for park management staff, researchers and volunteers Mod.
- provide public information and education materials and opportunities as outlined in this plan. High
- seek community involvement in the drafting of the Action Plan for the Biosphere Reserve and forward such plan to the Man and Biosphere Program Executive High

## 4 MANAGEMENT ACTIONS

The actions required to implement the management proposals outlined in Section 3 are summarised below. This ranking indicates the relative priority of projects and whether they are of a short term, moderate term or continuing nature.

PROJECT	Priority	Duration	Page
maintain photopoint network	High	Ongoing	13
mulga and nealie exclosures	High	Ongoing	13
encourage research into rare & endangered species	High	Ongoing	13
implement pest plant and goat control programs	High	Ongoing	13
encourage research into flora and fauna species	Mod.	Ongoing	13
develop a regional approach to artificial water supply			
dam and associated track rehabilitation	High Mod.	Short Short	13 13
establish Mucketty Dam grazing exclosure	High	Short	13
maintain boundary fencing	High	Ongoing	13
remove internal fences	Low	Ongoing	13
protect fire sensitive vegetation and man-made assets by controlling wildfire	High	Ongoing	14
maintain fire access tracks	Mod.	Ongoing	14
liaise with Aboriginal people	Mod.	Ongoing	15
implement Historic Site recommendation	Mod.	Short	15
define and maintain public vehicle tracks	High	Ongoing	16
close and where appropriate rehabilitate tracks not required for public/management purposes	Mod.	Short	16
provide sign-posted walking tracks	Mod.	Short	16
designate camp sites	High	Ongoing	18
restrict the use of solid fuel fires and encourage the use of other fuel types	High	Ongoing	18
establish an ecotour program			
provide information signs	High	Short	18
provide printed and sign-mounted visitor information	High	Short	18
if appropriate develop and provide educational activities	Mod.	Short	19
encourage research into the Park's ecosystem	Mod.	Ongoing	19
support existing research programs	High	Ongoing	20
utilise available staff	High	Ongoing	20
support the Murraylands Conservation Trust	High	Ongoing	20
seek external funds for regionally significant projects	High	Ongoing	20
maintain Murraylands Consultative Committee	High	Ongoing	20
liaise with adjacent land holders and Government instrumentalities	High	Ongoing	20
utilise volunteers and interested groups	High	Ongoing	20



**PROJECT****Priority Duration Page**

expand Dangali Biosphere Reserve and rename it Bookmark	High	Short	22
maintain Murraylands Conservation Trust as coordinator	High	Ongoing	22
undertake research, inventory + monitoring	High	Ongoing	22
train park staff, researchers and volunteers	Mod.	Ongoing	22
provide public information and education	High	Ongoing	22
draft Biosphere Reserve Action Plan	High	Short	22

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