BIG DESERT WILDERNESS PARK

MANAGEMENT PLAN

National Parks Service

and

North West Area

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

Victoria

July 1994

This Management Plan for the Big Desert Wilderness Park is approved for implementation. Its purpose is to direct all aspects of management of the Park until the Plan is reviewed.

Copies of this Plan may be purchased from:

- Department of Conservation and Natural Resources
  253 Eleventh Street
  MILDURA VIC 3500

- Information Centre
  Department of Conservation and Natural Resources
  240 Victoria Parade
  EAST MELBOURNE VIC 3002.

Further information on the Plan may be obtained from the CNR Mildura office.

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COVER: Typical scene of the Big Desert Wilderness

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APPROVED MANAGEMENT PLAN

This Approved Management Plan has been prepared under section 17B of the *National Parks Act 1975* (Vic.) and is approved for implementation. The Plan provides the basis for future management of the Park. It was finalised following consideration of the submissions received on the Proposed Plan.

Don Saunders
Director, National Parks Service

Ken King
Area Manager, North West Area

NOTE: PERTENDI BORE

Several parts of the Plan refer to water being available at Pertendi Bore in Ngarkat Conservation Park, South Australia. Water is usually available but as this is a remote area intending users should contact the South Australian Department of Environment and Natural Resources office at Tintinara (087 - 572 261) for up-to-date information. Water is also available at Comet Bore, approximately 20 kilometres south of Pertendi Bore, on the Pinaroo-Bordertown road.

FOREWORD

The Big Desert Wilderness Park is one of south-east Australia's outstanding wilderness areas. Established in 1979, it was Victoria's first wilderness park and is one of the least disturbed areas of semi-arid vegetation in Australia. Its undisturbed vegetation supports a diverse array of wildlife, including several significant species, and it provides outstanding opportunities for experiencing solitude and self-reliant recreation.

The area's continuing value as a wilderness depends upon maintaining its essentially undisturbed condition. This Approved Plan establishes the management framework and the actions required to protect the conservation and wilderness values of the Big Desert Wilderness.

The Plan puts particular emphasis on protecting and enhancing the wilderness condition of the Park, facilitating appropriate enjoyment and use of the area, and promoting complementary and co-operative management of the Big Desert Wilderness and the adjacent conservation parks in South Australia. The co-operative management of the Border Track (adjacent to the Wilderness Park) to reduce vehicle impacts while allowing appropriate four-wheel drive use is an example of the mutual benefits of this approach.

I look forward to the community's support for the management of this very important wilderness area, which is a significant part of Victoria's parks system.

The Hon Mark Birrell MP
Minister for Conservation and Environment

CONTENTS

1 INTRODUCTION

The Big Desert Wilderness Park (figure 1) (also referred to in the Plan as the Big Desert Wilderness or the Wilderness) covers 142 300 ha of semi-arid dunefields in the western Big Desert of the Victorian Mallee and is the largest of Victoria's 22 wilderness areas. First reserved under the *National Parks Act 1975* (Vic.) in 1979, it was the first wilderness area established in the State - initially covering 113 500 ha, with additions of 28 800 ha in 1992.

The Big Desert Wilderness protects one of the largest tracts of highest quality wilderness in south-eastern mainland Australia. It is highly valuable for nature conservation due to its lack of disturbance, diversity of flora and fauna, and the large number of significant or notable species. It also provides exceptional opportunities for experiencing solitude, inspiration and self-reliant recreation in a remote, semi-arid environment. Its ecological and recreational values are further enhanced by several adjacent conservation reserves in South Australia. In recognition of its significance, the original area of the Big Desert Wilderness was listed on the Register of the National Estate in 1979, shortly after proclamation.

The Big Desert Wilderness is managed by the North West Area of the Department of Conservation and Natural Resources, under delegation from the Director of National Parks (the Director). On-ground management is carried out by CNR personnel based at Wyperfeld National Park and Underbool reporting to the Chief Ranger at Hopetoun and the North West Parks and Reserves Manager at Mildura.

1.1 THE MANAGEMENT PLAN

Purpose

The Management Plan provides directions for the future management of the Big Desert Wilderness Park and surrounds, with particular emphasis on:

- protecting and enhancing the Park's wilderness condition;

- facilitating appropriate enjoyment and use of the area;

- promoting complementary and co-operative management with the South Australian Department of Environment and Natural Resources (SADENR), with regard to the adjacent Ngarkat group of conservation parks in South Australia (Ngarkat, Scorpion Springs and Mount Shaugh), and Border Track.

The Management Plan is a working document for planning and operations staff, but it also has the important role of informing the public of management proposals and enabling public input into management decisions. This was encouraged through the release of a Proposed Plan for comment in November 1991.

Planning area

The Plan primarily covers the Big Desert Wilderness Park (142 300 ha), but also includes recommendations for the management of public land abutting the Big Desert Wilderness (figure 1) where it affects the use and management of the Park. This includes part of Border Track (outside the Park), which is managed co-operatively with SADENR.

Planning process

Preparation of the Big Desert Wilderness Park Proposed Management Plan (DCE 1991) commenced in April 1991. Key groups and individuals with a particular interest in the Park were contacted with the aim of seeking information and input into key management issues. Public comment was invited with the release of the Proposed Plan in November 1991. Twelve public submissions were received and taken into account in the preparation of the Approved Plan. (Comments relating to the proposed Wilderness Walkers Code - Desert Parks will be taken into account when finalising that Code.)

Plan structure

The Plan consists of two parts:

- Chapters 2 to 5 provide background and resource information, as well as establishing the broad objectives and long-term directions for future management;

- Chapters 6 to 9 contain aims and actions necessary to achieve the management objectives identified in Chapter 4.

In Chapters 6 to 9, each action statement is numbered. Actions are not listed in priority order. Where an action either is repeated in another section or relates to an action in another section, the relevant actions are cross-referenced by use of a reference code comprising the section and action number; for example, 6.1/2 refers to Section 6.1, Action 2.

Plan period and amendment process

The Plan will operate for a minimum period of five years from the time of its approval, when the need for a review will be considered, or until an amendment is required.

Because planning is an on-going process, amendments to the Plan may become necessary due to:

- the availability of additional information;
- further management experience;
- issues arising which were not adequately covered in the Plan; or
- new government policies or strategies.

Any changes to the Plan will require the approval of the Director. Where major changes to the Plan are being contemplated, the relevant user groups will be consulted. The Director will be responsible for advising any changes to the Plan.

2 PARK DESCRIPTION

2.1 LOCATION, BOUNDARIES AND SETTING

Location

The Big Desert Wilderness Park is located at the western end of the Big Desert on the Victoria-South Australia border, approximately 400 km north-west of Melbourne (figure 1). It lies west of Murrayville Track, between the townships of Murrayville (15 km to the north) and Kaniva (60 km to the south).

Boundaries

The Big Desert Wilderness is surrounded by State Forest in Victoria, except where it abuts the Red Bluff Flora and Fauna Reserve in the south-west. The western boundary of the Wilderness is defined by the vermin-proof fence, adjacent to the Ngarkat group of South Australian conservation parks (Scorpion Springs, Ngarkat and Mount Shaugh) which are located in the eastern part of the Ninety Mile Desert, the South Australian extension of the Big Desert (figure 1).

The exact on-ground location of the State border west of the vermin-proof fence (and therefore the location of Border Track in relation to the State border) is currently being determined by survey being carried out by Victoria and South Australia. As at September 1993, indications from the survey are that virtually all of the track lies within Victoria.

The north-west and south-west corners of the Wilderness are adjacent to private property in South Australia.

Setting

The Big Desert Wilderness is located within the LCC Mallee Study Area, which comprises 4.3 million hectares, or almost 20 per cent of the State. Of this, 1.67 million hectares, or 37 per cent, is public land. Most of the public land is concentrated in two vast tracts, the Big Desert and the Sunset Country, both of which contain large areas of high wilderness quality.

Three national parks – Hattah-Kulkyne (48 000 ha), Wyperfeld (356 800 ha) and Murray-Sunset (633 000 ha) – and the Big Desert Wilderness comprise approximately 70 per cent of the public land in the Study Area. There are also seven wilderness zones, totalling 413 800 ha, within Murray-Sunset and Wyperfeld National Parks. Including the Big Desert Wilderness, the total area of designated wilderness in the Mallee Study Area is 556 100 ha, approximately 80 per cent of the State total. All other wilderness areas in Victoria are east of Melbourne.

While the economic base of the region is mainly agriculture (including dryland cropping, stock grazing and irrigation along the Murray River), tourism has grown considerably since the 1970s and is actively promoted. Most visitor activity is concentrated along the Murray River. However, recreation demand for the inland parks increased significantly through the 1980s and is expected to continue to do so following the proclamation of Murray-Sunset National Park in 1991, significant additions to Wyperfeld National Park in 1991 and 1992, and the implementation of the recently released Mallee Tourism and Recreation Strategy (CNR 1993).

2.2 CREATION OF THE PARK

The original Big Desert Wilderness was proposed by the LCC in the 1977 Mallee Study Area Final Recommendations (LCC 1977). Initially included on Schedule 3 (Other Parks) of the National Parks Act and proclaimed on 26 April 1979, the 113 500 ha Park was managed by the then National Parks Service. Prior to proclamation, the area was unreserved Crown Land.

As a result of the *National Parks (Amendment) Act 1989* (Vic.), the Park was included on the newly created Schedule Two A (Wilderness Parks) of the National Parks Act. This amending legislation provides for wilderness parks and wilderness zones within parks, and defines the objectives and principles for the management of these areas.

Following the LCC Wilderness Special Investigation Final Recommendations (LCC 1991), two additions totalling 28 800 ha were proclaimed on 30 June 1992 under the *National Parks (Wilderness) Act 1992* (Vic.).

2.3 NATURAL VALUES

Landforms

The landscape of the Big Desert Wilderness is the result of the following four main geomorphic events.

- A receding ocean shoreline during the early Pliocene (approximately 7 - 4.5 million years before present (BP)), leaving prominent north-south trending ridges on the upper surface of the Parilla Sand. These laterised during the monsoonal climate of the mid Pliocene, rendering them resistant to subsequent erosion. Remnants of these former foreshore dunes can be seen as rocky outcrops throughout the Big Desert.

- Weathering of the north-south ridges during arid periods of the mid-Pleistocene (700 000 - 400 000 years BP), and the subsequent formation of east-west linear dunes. These Lowan Sands are typically infertile, with a low water-holding capacity.

- Remobilisation of the east-west dunes at various stages during the late Pleistocene to early Holocene (400 000 years BP - approximately 10 000 years BP) to form jumbled, irregular dunes. In Victoria, this dune type is restricted to the Big Desert and the southern Sunset Country and are described as being of State significance (Joyce and King 1980). These dunes are mainly parabolic and sub-parabolic, with their apices to the east. They are inherently unstable and prone to remobilisation if disturbed.

- Stabilisation of the dunes by vegetation (mostly mallee) during the past 7 000 years.

As a result of these processes, the landscape of the Big Desert Wilderness comprises a large expanse of vegetated dunes, mostly with a relative relief of a few metres but with individual parabolic dunes 20-40 metres high. Occasional soaks and sandstone outcrops provide diversity in an otherwise geomorphologically uniform landscape.

Vegetation

Ten distinct floristic communities have been recognised for the Big Desert Wilderness (LCC 1987, Morcom and Westbrooke 1988).

Two communities dominate the Big Desert Wilderness. They are:

- Mallee Heath, characterised by an over-storey of Slender-leaf and/or Yellow Mallee *(Eucalyptus leptophylla/E. incrassata)*, with Scrub Cypress-pine (*Callitris verrucosa*), Dwarf She-oak *(Casuarina pusilla)*, Desert Hakea *(Hakea muelleriana)* and Green Tea-tree *(Leptospermum coriaceum)* dominant in the shrub layer.

- Sand-plain Heath, which is typically treeless, with the canopy dominated by Desert Banksia (*Banksia ornata*), Dwarf She-oak and either Green Tea-tree or Heath Tea-tree *(L. myrsinoides)*.

Perhaps the most significant of the vegetation community types is Scrub-pine Woodland, which depends upon the long-term absence of fire for its development. The LCC (1987) describes this community as formerly being far more widespread but fires in the Big Desert in 1959 and the 1980s have reduced its distribution. In the oldest examples, former co-dominants Desert Banksia and/or Dwarf She-oak have senesced and disappeared, leaving only Scrub Cypress-pine as the dominant overstorey species, with scattered annuals in the understorey (Cheal et al. 1979).

The boundaries of this woodland correlate to sections of the Park not burnt during or since the 1959 wildfire (Morcom and Westbrooke 1988). This wildfire burnt a large proportion of the Big Desert Wilderness, indeed virtually the entire Big Desert, and created extensive areas of even-aged vegetation. Parts of the Wilderness have burnt since, but many of its vegetation communities still date from this time.

The Big Desert Wilderness also contains the largest undisturbed areas of Broombush Mallee in the State. (Stands throughout the recent additions to Wyperfeld National Park have been disturbed in the past by the activities of broombush cutters.) Small isolated patches of Big Mallee and/or Yellow Gum Woodland also occur and are particularly important for the conservation of hollow-dependent birds, as well as providing nesting sites for raptors.

Other floristic communities present include: Dune-crest Tree-heath, Sandstone-rise Broombush, Heath Woodland, Red-swale Mallee and Pine-Buloke Woodland.

Thirteen rare or threatened plant species have been recorded in the Big Desert Wilderness (table 1). Little is known of the management requirements for most of these species but it is assumed that the maintenance of a mosaic of vegetation age classes and floristic communities in an undisturbed setting will help to ensure their survival.

The structure and floristic composition of the vegetation communities of the Mallee is primarily dependent upon the influences of soil type and their drainage properties, topography and fire. Indeed, the maintenance of both plant and animal populations frequently depends upon episodic regeneration following fire (Mutch 1970), and most species have evolved mechanisms which enable them to cope with recurrent fire.

Many factors must be considered when determining an appropriate fire regime for the wilderness area. These include the requirements of the different vegetation communities and their dependent flora and fauna for fire, the distribution and range of age classes of the vegetation since last burnt, the requirements of specific, threatened communities and species, and the preference to allow natural processes take their course as much as possible.

The response of plants to fire varies between species and the season, intensity and frequency of fire. For example, heathlands contain many fire-sensitive species with canopy-stored seed and can be vulnerable to frequent fires (Gill 1990, McMahon 1977). Amongst those

species are Desert Banksia and Scrub Cypress-pine, dominants of the Sand-plain Heath and Scrub-pine Woodland communities respectively.

Noble (1989), in field trials at Pooncarie, New South Wales, found that the recruitment of mallee and Porcupine Grass *(Triodia irritans)* seedlings was significantly reduced by autumn fires in comparison to spring fires, and forbs were only common post-fire following spring to late summer fires. This included one dominant species previously not recorded in NSW that had disappeared by the following season. Parsons and Browne (1982) have also recorded several rare forbs from the Victorian Mallee. This does not necessarily reflect that a plant is endangered, but merely that it is dependent upon episodic fire for its regeneration. Mallee was also demonstrated to regenerate successfully from lignotubers, irrespective of season of burn, if fire intervals were greater than 5-10 years; more than two autumn burns in close succession, however, induced significant mortality.

TABLE 1 RARE AND THREATENED FLORA OF THE BIG DESERT WILDERNESS

Species	Status in Victoria	Community
Allocasuarina luehmannii+	d	Pine-Buloke Woodland
Comesperma scoparium	v	Mallee Heath
Dillwynia uncinata	r	Broombush Mallee
*Microcybe multiflor*a	v	Broombush Mallee
Olearia picridifolia	v	Red-swale Mallee
Phebalium lowanense	v	Sand-plain Heath
Phyllotta remota	r	Sand-plain Heath
Pultenaea acerosa	v	*
Pultenaea densifolia	r	Mallee Heath
Santalum acuminatus	d	#Broombush Mallee
Schoenus racemosus	r	Mallee Heath/Sand-plain Heath
Senecio magnificus	r	**
Styphelia exarrhena	r	Mallee Heath Sand-plain Heath

Source: Flora Information System, Flora Section, Flora, Fauna and Fisheries Division, CNR

Status: d depleted)
v vulnerable) See Gullan et al. (1990).
r rare)

+ Listed under the *Flora and Fauna Guarantee Act 1988* (Vic.) as a threatened species.
* Red Bluff area - community not recorded
** Community unknown for Big Desert Wilderness
# Recorded in Broombush Mallee in the Big Desert Wilderness but more typically from Pine-Buloke Woodland in the Mallee

Fire suppression may also indirectly affect native vegetation when phosphate-based retardants are used on nutrient deficient soils, which are predominant in the Wilderness. Heddle and Specht (1975), in a study near Keith in South Australia, found that phosphorus fertilizer changed heath vegetation towards an 'herbaceous sward' over a 22 year period, whereas sulphate or nitrate-based fertilisers appeared to have had only temporary effects on vegetation. Bradstock et al. (1987) reported similar short-term effects on vegetation in a eucalypt forest when trialling ammonium-sulphate as a retardant.

In addition to topography, soil types and their drainage properties, and fire, severe frost may also influence the composition and distribution of vegetation communities. Studies by O'Brien (1989) at Wyperfeld National Park revealed that Desert Banksia, amongst others, was killed outright by severe frosts in 1982. Recovery of this species, exacerbated by the 1981-83 drought, was negligible, effectively changing the composition of the Sand-plain Heath in which it was formerly dominant. Similarly, Morcom and Westbrooke (1988) recorded that it took four years for basal shoots to appear on completely defoliated Broombush *(Melaleuca uncinata)* after severe frosts within the Big Desert Wilderness.

Fauna

Specific knowledge of the fauna of the Big Desert Wilderness is sparse, but survey results from other parts of the Big Desert are likely to be indicative. Species considered significant or notable by Robertson et al. (1989) and which are likely to occur in the Big Desert Wilderness are listed in table 2.

The Big Desert has a rich faunal assemblage, which reflects three main factors:

- the diversity of the vegetation;

- the location of the area between the mesic environment to the south and the arid environment to the north, and the consequent intermingling of the species typical of both;

- the relative lack of disturbance and low numbers of introduced predators.

While the number of mammal species in the Mallee area has declined since European settlement, it appears that those of the Big Desert have fared better than most. Seventeen species of mammals, excluding bats, have been recorded for the Big Desert – Ninety Mile Desert. Of these, three are now believed to be locally extinct compared to 12 out of 22 species for the Sunset Country (Bennett et al. 1989). This can almost certainly be attributed to the relative levels of disturbance in the two areas, related to factors such as grazing by introduced herbivores, predation by introduced carnivores and fragmentation and modification of habitat (LCC 1987).

Small native mammals are most common in the heathland communities. The Little Pygmy-possum *(Cercartetus lepidus)*, Western Pygmy-possum *(Cercartetus concinnus)* and Silky Mouse *(Pseudomys apodemoides)* are widespread, and the Common Dunnart *(Sminthopsis murina)*, Mallee Ningaui *(Ningaui yvonneae)* and Mitchell's Hopping Mouse *(Notomys mitchelli)* are also present.

Bird diversity is evidently dependent upon the structural complexity of the vegetation. Emison and Bren (1989) found that Mallee Heath, with an overstorey of mallee, supported more species than single stratum heath. The abundance and diversity of honeyeaters is a distinctive feature of the avifauna, with at least 11 species having been recorded (Robertson et al. 1989). The Big Desert Wilderness may also provide important habitat for such threatened species as the Western Whipbird *(Psophodes nigrogularis)* and Australian Bustard *(Ardeotis australis)*.

The LCC Mallee Study Area supports a greater diversity of herpetofauna than any other region in Victoria (LCC 1987). Menkhorst (1982) recorded 22 species of reptiles from a single site in the Big Desert. This diversity can again be attributed to the overlap of the two biogeographic regions and the wide range of habitats available. Porcupine Grass, a major understorey species in Sand-plain Heath and Mallee Heath, provides an extremely important micro-environment for reptiles.

TABLE 2 SIGNIFICANT AND NOTABLE VERTEBRATE SPECIES LIKELY TO OCCUR IN THE BIG DESERT WILDERNESS

Significant species

Little Pygmy-possum	*Cercartetus lepidus*
Silky Mouse	*Pseudomys apodemoides*
Malleefowl+*	*Leipoa ocellata*
Regent Parrot#	*Polytelis anthopeplus*
Australian Bustard+	*Ardeotis australis*
Red-lored Whistler#	*Pachycephala rufogularis*
Western Whipbird+	*Psophodes nigrogularis*
Mallee Emu-wren#	*Stipiturus mallee*
Slender-billed Thornbill	*Acanthiza iredalei*
Black-eared Miner+*?	*Manorina melanotis*
Rosenberg's Goanna	*Varanus rosenbergi*

Notable species

Mallee Ningaui	*Ningaui yvonneae*
Common Dunnart	*Sminthopsis murina*
Western Pygmy-possum	*Cercartetus concinnus*
Mitchell's Hopping-mouse	*Pseudomys mitchelli*
Gilbert's Whistler	*Pachycephala inornata*
Striated Grasswren	*Amytornis striatus*
Rufous Calamanthus	*Sericornis campestris*
Western Blue-tongued Lizard	*Tiliqua occipitalis*
Pink-nosed Worm-Lizard	*Aprasia inaurita*
Butler's Legless Lizard	*Delma butleri*
Norris's Dragon	*Amphibolurus norrisi*
Lined Earless Dragon+	*Tymparocryptis lineata lineata*
Brooks's Striped Skink	*Ctenotus brooksi iridis*
Heath Skink#	*Egernia multiscutata*
Bardick	*Echiopsus curta*
Port Lincoln Snake	*Unechis spectabilis*

Sources: Robertson et al. (1989)
Peter Robertson, Flora, Fauna and Fisheries Division, CNR (pers. comm.)

\+ Listed under the Flora and Fauna Guarantee Act as a threatened species.
\# As at July 1994 recommended for listing under the Flora and Fauna Guarantee Act as a threatened species.
* Listed as endangered under the *Endangered Species Protection Act 1992* (Cwlth).
? Occurrence possible.

Note: The table is based on the records of species either from the Big Desert Wilderness or from similar habitat in the Big Desert. Robertson et al. (1989) includes information on the habitat, conservation status, etc of these species.

Three species of frogs are also recorded for the Big Desert. These species have adapted to their arid environment by burrowing into the ground during adverse weather conditions and emerging to breed only after heavy rain.

The invertebrate fauna of the area is still largely undescribed. Recent surveys by the Museum of Victoria have added greatly to our knowledge of species richness but, except for butterflies, most invertebrate groups comprise a large proportion of undescribed species.
Douglas (1993) studied the habitat requirements and distribution of diurnal Lepidoptera (moths and butterflies) throughout the Mallee area, and identified critical habitats for rare species, including hill tops and dune crests. Because populations of these species are generally sparsely distributed, a breeding strategy has developed whereby sexually mature males establish territories on high points during the breeding season and attempt to mate with any intruding females.

Introduced species

Several introduced plant species have been recorded in the Big Desert Wilderness. These species are generally associated with disturbances, such as Mesa Track, and tend to be non-invasive in undisturbed vegetation communities.

Seven introduced vertebrate species have been recorded for the Big Desert Wilderness. The densities of these species in the Wilderness are largely unknown but, in general, are considered to be low. The actual extent of their ecological impact is also largely unknown and will vary depending on the species; generally the principles of competition and predation will apply. For example, predator efficiency has been shown to increase in open areas, such as tracks (Lunney et al. 1990). Introduced predators, such as Dogs (*Canis familiaris*) and Foxes (*Vulpes vulpes*), favour such areas as pathways for movement and hunting, and tracks may also facilitate their dispersal into otherwise remote areas (LCC 1991). Rabbits (*Oryctolagus cuniculus*) are generally uncommon throughout the Big Desert, but have the potential to reduce the regeneration of native pine (Morcom and Westbrooke 1988). Other introduced vertebrate species which have been recorded include: Cat (*Felis catus*), Goat (*Capra hircus*), House Mouse (*Mus musculus*) and Common Starling (*Sturnus vulgaris*).

The Honey Bee *(Apis mellifera)* has also been recorded in the Big Desert Wilderness. Honey Bees may be deleterious to native species in that they can remove large quantities of nectar and pollen from some native plants (Paton 1990), their forage behaviour can lead to inefficient pollination of native plants (Paton 1993), and they may displace native fauna by establishing hives in tree hollows (F. Noelker, 1988 unpublished data). Honey Bees can also interfere with recreation by congregating around water points.

2.4 HISTORY

Aboriginal occupation

Aborigines have been resident in south-eastern Australia for at least 40 000 years, but any possible evidence of occupation in the semi-arid Mallee is restricted to the last 18 000 years because of earlier dune activity. Since then, climatic conditions in the region were most favourable 10 000 - 6 000 years BP but archaeological sites from this period are almost all restricted to lake systems (Ross 1987).

Archaeological evidence suggests a population expansion into the semi-arid Mallee approximately 4 000 BP, despite increasing aridity. Ross (1987) attributes this to the development of a complex social network.

Archaeological sites

Known Aboriginal archaeological sites within the Big Desert are almost solely restricted to either the Outlet Creek System within Wyperfeld National Park, or in the soaks of the irregular dune fields further to the west, including the Big Desert Wilderness.

Seven archaeological sites have been recorded for the planning area. Five of these are associated with rock outcrops where stone was quarried. The other two are stone artefact scatters. These sites have been discovered largely by chance and it is probable that a systematic site survey would result in many more Aboriginal sites being discovered.

European activity

European exploration of the western Big Desert began in earnest in May 1849, when E. R. White was appointed to survey the border line between the then colonies of South Australia and New South Wales. White subsequently ranged throughout much of the Mallee at the order of Governor Latrobe, in an attempt to determine the feasibility of opening a road between the Murray-Darling junction and the upper Wimmera.

Pastoral occupation of the area immediately south of the Big Desert Wilderness also commenced in the late 1840s, with the leasing of Yanac, Eldorado and Ballerook runs. Between 1859 and 1862 annual depasturing licences were issued for much of the Big Desert, including the area now covered by the Big Desert Wilderness, but it is probable that few of them were ever taken up (Kenyon 1912).

During the 1860s, cattle were frequently driven between Kow Plains (east of Murrayville) and Nhill Station, and this alignment eventually became the established route between the two (now the Murrayville Track) (Bardwell 1980). Several waterholes were used as camps by the stockmen, including Big Billy, Moonlight Tank, Waggon Flat and The Springs.

By 1881, many of the squatting licences had been forfeited to the Crown. The *Mallee Pastoral Leases Act* was passed in 1883, with the object of giving, for the first time, long-term leases over large tracts of land. Blocks 38 and 39, which covered what is now the Big Desert Wilderness, both comprised over 1 000 square kilometres. Due to lack of water and poor grazing capability, however, these blocks were never let.

A vermin-proof fence was erected along the border in 1887-88, in response to increasing attacks on sheep by wild dogs. It gradually fell into disrepair and in 1959 financial assistance to landholders for repairs was stopped on the grounds that the fence had ceased to be effective and repairs had become uneconomic.

Many groundwater bores were sunk in the western Mallee in the first half of this century. One of these bores is located within the Big Desert Wilderness near the Mesa Track approximately 6.5 kilometres west of Murrayville Track. The bore was sunk in 1945 to a depth of 76 metres.

More recently, army exercises, often involving tracked vehicles, have been conducted throughout the northern section of what is now the Big Desert Wilderness, the last being in 1975. Since then, activity has been concentrated north of the Wilderness and east of Murrayville Track.

Historic sites

No significant historic sites were identified within the Big Desert Wilderness by Ward et al. (1986) in their study of the Victorian Mallee. However, it is assumed that this study would not have considered the vermin-proof fence, which defines the western boundary of the Big Desert Wilderness.

The fence, although no longer vermin-proof, is symbolic of the struggles of early settlers and their attempts to control vermin, a problem which contributed largely to either the success or failure of many farming ventures until mid-way through this century.

2.5 WILDERNESS VALUES

The Big Desert Wilderness is an outstanding semi-arid wilderness area. It contains extensive undisturbed mosaics of vegetation representative of the major land systems of the Big Desert, as well as relict vegetation communities of Scrub-pine Woodland and many significant plant and animal species. Introduced plant and animal numbers are considered to be generally very low. It contains one of the largest untracked areas in south-eastern mainland Australia.

Wilderness quality – the extent to which an area is remote from and undisturbed by the influences of modern technological society – has been mapped in relative terms for the major blocks of public land in Victoria by Preece and Lesslie (1987) using four criteria:

- remoteness from access;

- remoteness from settlement;

- aesthetic naturalness, or the degree to which the landscape is free from the presence of the permanent structures of modern technological society;

- biophysical naturalness, or the degree to which the natural environment is free of biophysical disturbance due to the influence of modern technological society.

Preece and Lesslie (1987) identified the western Big Desert (including the Park) as containing the largest area of highest wilderness quality in Victoria. The LCC (1990) considers that the Big Desert Wilderness has even higher wilderness quality than that recorded by Preece and Lesslie (1987), who reduced values for biophysical naturalness because of earlier records of grazing licences. It appears, however, that few of these grazing licences were ever taken up, and thus the area's biophysical quality – and therefore total wilderness quality – may be even higher than originally assessed.

The main track network in and around the Big Desert Wilderness is shown on figure 1. Several other tracks not mapped, particularly those associated with the suppression of recent wildfires, have largely revegetated and will become inevident over the next few years.

There are three known structures that influence the wilderness quality of the Big Desert Wilderness: a disused bore located near the Mesa Track approximately 6.5 kilometres west of Murrayville Track; the vermin-proof fence along the western margin of the Wilderness; and Hensleigh's Trig. which is readily visible from much of the surrounding area due to its prominent location.

The nearest private land is in South Australia, adjacent to the Wilderness boundary at its extreme south-west and north-west corners.

2.6 VISITOR USE

The Big Desert Wilderness is an outstanding area for remote walking in a semi-arid environment. It offers the possibility of walking trips of up to several days duration in an area that is one of the few remaining unmodified areas in south-eastern mainland Australia.

At present, visitor use is very low and is estimated to be less than 500 visitor days per year. This is due at least partly to the lack of surface water in the area and the consequent need for walkers to carry all of their own water. Walkers in Victoria also have traditionally tended to favour the mountainous and coastal parts of the State in preference to the less well-known and drier semi-arid areas.

However, as the enlarged Mallee parks become better known and as walkers seek out more remote walking opportunities, it is expected that there will be an increased interest in wilderness walking in the Mallee, and that visitor use of the Big Desert Wilderness will likewise increase.

Several camping sites in the vicinity of the Big Desert Wilderness are good locations from which to base walking trips into the Wilderness (figure 1). The main sites (with water) are: Broken Bucket Tank and Big Billy Bore on the Murrayville Track, and Pertendi Bore in Ngarkat Conservation Park in South Australia (see note on page ii). Other camping sites (without water) include: Red Bluff and Black Box Flat in Victoria, and Pine Hut Soak in Scorpion Springs Conservation Park in South Australia.

Border Track, four-wheel drive touring route, provides four-wheel drive access along the western boundary of the Wilderness.

3 LEGISLATIVE AND OTHER BASIS

Legislation

Big Desert Wilderness Park is managed under the provisions of the National Parks Act. Section 4(ab) (the objects of the Act with respect to wilderness areas) and Sections 17A and 17C (the main management provisions for wilderness areas - see appendix 1) provide the main legislative basis for managing the Wilderness. Other relevant legislation includes the *Wildlife Act 1975* (Vic.), Flora and Fauna Guarantee Act, *Vermin and Noxious Weeds Act 1958* (Vic.), *Forests Act 1958* (Vic.) and *Archaeological and Aboriginal Relics Preservation Act 1972* (Vic.).

LCC recommendations

The Wilderness Special Investigation Final Recommendations (LCC 1991) contain general recommendations for the use and management of wilderness areas, including the Big Desert Wilderness (recommendations A1-A20 (a)-(k)). In addition, and specifically in relation to the Big Desert Wilderness, the LCC recommended that:

'(l) particular emphasis be given to the control of vehicle access to the edges of the wilderness area

(m) the land manager, in consultation with the apiculture industry and the individual beekeepers affected, relocate that apiary site whose bee forage area overlaps the wilderness area to another suitable site'. (This has now occurred.)

The recommendations establish that wilderness areas should be managed to maximise the extent to which the area is undisturbed by the influences of the European settlement, ensure the maintenance and protection of the natural environment, and provide opportunities for the public to enjoy inspiration, solitude and appropriate self-reliant recreation in undisturbed natural settings.

Recommendations M1 - M14 covering Management Principles for Wilderness Areas also apply to the Big Desert Wilderness.

Strategies

The Mallee Tourism and Recreation Strategy (CNR 1993) identifies tourism opportunities on public land in the Mallee, and the role that wilderness areas have in contributing to the special character and appeal of the Mallee. The Big Desert Wilderness is located in the Mallee Wilderness unit delineated in the Strategy.

Guidelines and plans

This Plan conforms to, and should be used in conjunction with, the following CNR procedural documents:

- NPS, Guidelines and Procedures Manual (NPS 1993);
- Recreation Facilities Manual (CFL 1987);
- other CNR guidelines and procedures as appropriate.

The Plan also conforms with the Mildura Regional Fire Protection Plan (CNR 1992). This plan provides the basis for fire protection in the Big Desert Wilderness.

4 MANAGEMENT OBJECTIVES

The management objectives for the Big Desert Wilderness are largely established by the wilderness provisions of the National Parks Act. The following objectives will apply.

1 Maximise the extent to which the area is undisturbed by the influences of European settlement.

2 Allow natural environmental processes to occur with minimal interference from the influences of European settlement.

3 Conserve and protect the natural environment including indigenous flora and fauna and features of ecological, geological, archaeological, historic, scientific and scenic significance.

4 Eradicate or control non-indigenous plants and animals.

5 Carry out appropriate fire protection measures.

6 Provide opportunities for the use and enjoyment of the area by the public for solitude, inspiration and appropriate self-reliant recreation in a wilderness setting.

7 Promote community awareness, understanding and appreciation of wilderness values.

8 Provide for appropriate scientific research.

9 Facilitate complementary and co-operative management of the Big Desert Wilderness and adjacent Ngarkat group of conservation parks in South Australia.

One additional management objective for adjoining public land relates primarily to recreation.

10 Assist visitor use of the Big Desert Wilderness by providing appropriate recreation opportunities and facilities on adjacent public land, while ensuring conservation and wilderness values are protected.

5 OVERVIEW OF MANAGEMENT

The Big Desert Wilderness is an outstanding semi-arid wilderness area and one of the least disturbed parts of Victoria. Its essentially undisturbed condition, large size and the occurrence of several significant species and communities make it highly valuable for nature conservation. It is an outstanding setting in which to experience solitude, inspiration and undertake self-reliant recreation, notably walking.

The primary objective in managing the area will be to preserve and, where possible, enhance its wilderness condition (i.e. the extent to which it is undisturbed by the influences of the European settlement) and to allow natural processes to operate with the minimum of interference. Priority will therefore be given to protecting and conserving the natural environment and maintaining it in an undisturbed condition.

In general terms, the Big Desert Wilderness does not require intensive management but several management actions will enhance its value as one of Victoria's key wilderness areas.

The main issues requiring management attention are: the removal of a minor structure; the successful closure and rehabilitation of several vehicular tracks (principally the Mesa Track); the control of illegal vehicle entry; sensitive fire management; the encouragement of safe and minimal impact use of the area; and co-operation with SADENR over cross-border management. Control of pest plants and animals may also be required at certain sites. Several of these issues will need to be addressed as part of broader regional programs relating to the Mallee parks system as a whole.

The wilderness provisions of the National Parks Act establish the basis for managing the Big Desert Wilderness. These include prohibiting certain developments and activities (such as the use of vehicles) except in certain circumstances (generally when considered essential or necessary for the responsible management of the area or in other specified cases). The exceptions provided for in the case of the Big Desert Wilderness and the reasons for them are summarised in table 3. (These should be read in conjunction with the relevant sections of the National Parks Act in appendix 1.)

TABLE 3 PERMITTED ACTIVITIES OTHERWISE PROHIBITED

Prohibited activity	NP Act section	Exception permitted	Reason	NP Act section
Commercial activities	17c(1)(b)	Commercial recreation tours - walking	Compatible use	17c(2)(c)
Motorised or mechanical transport	17c(1)(c)	Management vehicles	Fire management Search and rescue Control of non-indigenous plants and animals	17c(2)(f) 17c(2)(f) 17c(2)(a)

6 RESOURCE CONSERVATION

6.1 FLORA AND FAUNA

Major management considerations

- The Big Desert Wilderness is an important area for nature conservation and contains excellent examples of undisturbed communities and many significant or notable species.

- Knowledge of the ecology of many individual species and communities is poor.

- The responsible management of species or communities listed as threatened under the Flora and Fauna Guarantee Act may require interventionist management for the overall benefit of the species or community.

- Prescribed burning, wildfire suppression methods and wildfire regimes influence the composition and structure of vegetation communities and their associated fauna.

- Extensive areas of very old vegetation, including Scrub-pine Woodland, exist in the north-west corner of the Big Desert Wilderness.

- Hill tops and dune crests are critical locations for the mating and breeding of many insect species.

- Tracks facilitate the establishment of weed species and increase the dispersal and efficiency of introduced predators.

- Honey Bees may have significant ecological effects, in that they may deprive native pollinators of food, displace native species from tree hollows and affect the reproductive capacity of flora.

Aims

- Allow natural processes to occur as far as possible with the minimum of human interference.

- Protect and maintain native plant and animal communities in an undisturbed condition, but give special attention to threatened species and communities where appropriate.

- Allow a mosaic of vegetation age classes and floristic communities to develop by reducing the possibility of one fire burning a large proportion of the Wilderness.

Actions

1 Allow habitat manipulation (including prescribed burning) for ecological purposes only where it can be demonstrated that such action is necessary for the conservation of a significant community or population. This would be subject to the approval of the Director of National Parks, and occur only after the preparation of a soundly researched community or species management plan and provided no other viable alternatives were available. (Listing of a community or species under the Flora and Fauna Guarantee Act with an approved action statement would constitute an appropriate basis for such action.) (7.3/5)

2 Undertake the actions relating to rehabilitation of disturbance, pest plants and animals, and fire management as specified in sections 7.1, 7.2 and 7.3.

6.2 CULTURAL SITES

Major management considerations

- Known sites of cultural significance are essentially restricted to Aboriginal archaeological sites. On the western margin of the Wilderness, the remains of the vermin-proof fence has significant symbolic value as a reminder of the struggles of early settlers and their attempts to control vermin.

- A disused groundwater bore constructed in 1945 by the then State Rivers and Water Supply Commission is located near the Mesa Track. Other similar bores exist in the Mallee outside the Wilderness.

- There has been no systematic search for archaeological sites within the Big Desert Wilderness.

- Those archaeological sites known to date have been discovered by chance, and there is a high probability that further survey work would result in more sites being recorded.

Aims

- Preserve and protect sites of archaeological or historical importance.

- Improve knowledge and understanding of the pre-history and history of the Mallee.

Actions

1 Protect archaeological sites from further disturbance.

2 Permit appropriate archaeological surveys of the Big Desert Wilderness, in accordance with Section 17C(2)(e) of the National Parks Act. (6.3/1)

3 Notify Aboriginal Affairs Victoria and the relevant Aboriginal community (Goolum Goolum Co-operative) of any archaeological sites discovered in the Big Desert Wilderness.

4 Photographically record the disused bore beside Mesa Track prior to its removal and capping. (7.1/1)

5 In conjunction with SADENR, assess the vermin-proof fence to determine which appropriate section or sections should be retained for cultural and interpretation purposes. A section near the entrance to Red Bluff may be appropriate. Allow the remainder to deteriorate naturally. (9.1/1)

6.3 RESEARCH

Major management considerations

- Knowledge of the ecology of many individual species and communities is poor.

- Due to its essentially undisturbed condition, the Big Desert Wilderness provides opportunities for comparative studies with modified environments elsewhere.

- Some survey and other research techniques (e.g. biomass sampling) can be destructive.

Aim

- Permit appropriate research.

Actions

1 Issue permits under the National Parks Act for non-destructive and non-manipulative research which is in accordance with Section 17C(2)(e) of the National Parks Act and LCC recommendation M7 (LCC 1991).

2 Encourage research into the control of feral Honey Bees, in consultation with the apiary industry. (7.2/4).

3 Encourage the development of a better understanding of the ecology and fire regimes of the Big Desert Wilderness. (Note: Certain types of research (e.g. experimental burning) may be better carried out outside the Wilderness but in areas that are considered representative of those inside.)

7 PARK PROTECTION AND ENHANCEMENT

7.1 REHABILITATION OF DISTURBANCE

Major management considerations

Structures

- The vermin-proof fence along the western margin of the Wilderness has significant symbolic value as a reminder of the struggles of early settlers.

- A disused bore, constructed in 1945 by the then State Rivers and Water Supply Commission, is located beside Mesa Track. This bore was sunk to a depth of 76 m and is a possible source of saltwater contamination of the freshwater Duddo Limestone Aquifer, which is sandwiched between two highly saline aquifers. The Duddo Limestone Aquifer is a vital source of water for the western Mallee, and the Mallee Dryland Community Salinity Working Group (1993) has recommended that abandoned groundwater bores be sealed to prevent seepage from the upper saline aquifer into the fresh groundwater reserves.

Tracks

- Tracks facilitate the establishment of weed species and increase the dispersal and efficiency of introduced predators.

- Tracks have an aesthetic impact, especially when visible over long distances.

- Attempts to prevent vehicular access on closed tracks have failed in the past.

- Tracks associated with the 1989 wildfire in the north of the Big Desert Wilderness are revegetating.

Aim

- To remove evidence of developments, including tracks and structures, that is not considered essential for the responsible management of the Big Desert Wilderness, or not of historical importance.

Actions

1 Seal the disused groundwater bore beside Mesa Track and remove the above ground pipe. (6.2/4)

2 After the bore has been sealed, rip an appropriate section of Mesa Track from its junction with Murrayville Track and cover it with brush to encourage revegetation. (7.2/3)

3 Erect vehicle barriers and/or fencing across Mesa Track at its junction with Murrayville Track, with appropriate signs explaining the reasons for the track closure.

4 Encourage the re-establishment of native vegetation along other tracks as necessary. (7.2/3, 7.3/7)

5 Monitor the rehabilitation of fire tracks associated with recent fires and install barriers and revegetate by ripping and laying brush where necessary to ensure that they remain closed to vehicular access. (9.3/1)

7.2 PEST PLANTS AND ANIMALS

Major management considerations

- Very few pest plants are able to invade and out-compete undisturbed native vegetation communities typical of the Big Desert Wilderness.

- Introduced animals can compete with or feed upon native flora and fauna.

- Most pest plants and some pest animals in the Big Desert Wilderness are associated with disturbed areas, such as tracks, and are generally absent or in low numbers where native vegetation cover is retained.

- Tracks facilitate the invasion, dispersal and efficiency of introduced predators.

- Feral Honey Bees occur in the Big Desert Wilderness and are currently difficult to control.

Aim

- Eradicate or control non-indigenous plants and animals.

Actions

1 Identify and monitor the occurrence of introduced plants and animals to assess the need for their eradication or control. Priority should be given to monitoring rabbits in susceptible communities, such as those containing regenerating native pine, and monitoring the impact of foxes. (9.3/1)

2 Treat pest plants and animals using control methods that have the least impact on the natural environment. Priority should be given to those species which are seen to be spreading or having an adverse effect upon the native flora and fauna or the recreational experiences of visitors.

3 Encourage the re-establishment of native vegetation along Mesa Track and other tracks as necessary to reduce the possibility of weed invasion and their use by introduced predators. (7.1/2, 7.1/4, 7.1/5)

4 Develop appropriate control methods for feral Honey Bee colonies in consultation with the apiary industry, and destroy colonies located in the Wilderness and in the surrounding area. (6.3/2)

7.3 FIRE MANAGEMENT

Major management considerations

- Fire is a natural component of the Mallee environment.

- Fuel reduction burning, wildfire suppression and altered wildfire regimes influence the composition and structure of vegetation communities and their dependent fauna.

- Most of the Big Desert Wilderness was burnt by a wildfire in 1959.

- Extensive areas of very old Scrub-pine Woodland exist in the north-west of the Big Desert Wilderness.

- Phosphate-based retardants may have adverse effects on native vegetation growing on nutrient-poor soils.

- Tracks associated with fire suppression activities may permit illegal access by vehicles, facilitate the dispersal and colonisation of pest plants, and animals and leave long-term scars that may affect the wilderness experience of visitors.

- The Mildura Regional Fire Protection Plan (CNR 1992) proposes that, in order to reduce the possibility of a fire burning a large proportion of the Big Desert Wilderness, the area should be divided east-west into two blocks using wind-driven strip burns. These burns would be aerially ignited and designed to link previously burnt areas. Their location would be reviewed after any fire.

- Experimental burning is generally not appropriate in wilderness areas, where it is intended that natural processes should predominate.

Aims

- Allow a mosaic of vegetation age classes and floristic communities to develop, by reducing the possibility of one fire burning a large proportion of the Big Desert Wilderness.

- Conserve significant species and communities.

- Suppress wildfires in accordance with approved policies and plans, minimising the damaging effects of fire suppression activities.

Actions

1 Carry out fire protection and suppression in accordance with National Parks Service guideline 2.5.1 P 'Fire management for wilderness areas' (CNR Guideline 05-20-0090-1), and the Mildura Regional Fire Protection Plan.

2 Use infrequent strip burns in accordance with the Mildura Regional Fire Protection Plan to reduce the possibility of one fire burning a large proportion of the Big Desert Wilderness.

3 Whenever possible, carry out strip burning in late spring or late summer/early autumn to minimise the impact of those vegetation types sensitive to cool-season burning.

4 Plan to avoid areas of very old vegetation when carrying out strip burns in accordance with the Mildura Regional Fire Protection Plan.

5 Prescribe fire for ecological purposes only where it can be demonstrated that such action is deemed necessary in accordance with the requirements of Action 6.1/1.

6 When required for fire suppression, use sulphate or nitrate-based fire retardants, as opposed to phosphate-based retardents.

7 Rehabilitate any tracks and other disturbances established in the course of fire suppression activities. (7.1/4)

8 Monitor the effects of fire management, in particular strip burning. (9.3/1)

9 As research provides a better understanding of fire regimes in the Big Desert, ensure that the Big Desert Wilderness is included in any ecological fire management strategy that may be prepared for the broader Big Desert. This should pay particular attention to the objectives of the Park, including the requirement to allow natural processes to predominate, while protecting significant populations or communities.

8 VISITOR USE

8.1 WALKING, CAMPING AND NATURE STUDY

Major management considerations

- The Big Desert Wilderness provides outstanding opportunities for experiencing solitude and self-reliant recreation, particularly walking, non vehicle-based camping and nature study.

- Wilderness areas should provide the opportunity for visitors to discover the area for themselves.

- The recreational use of vehicles, horses, camels and other non-indigenous animals, and recreational hunting are not permitted in the Big Desert Wilderness.

- Current use of the Big Desert Wilderness is estimated to be less than 500 visitor days per year and is not expected to increase dramatically.

- Most visitors to the Wilderness currently approach it from the Murrayville Track.

- Use of Border Track for 4WD touring by organised clubs is increasing, particularly on long weekends and during school holidays. This may influence use of the Big Desert Wilderness along its western edge.

- Several camping sites in the vicinity of the Big Desert Wilderness are good locations from which to base walking trips into the Wilderness. The main sites, which usually have water, are: Broken Bucket Tank and Big Billy Bore on Murrayville Track, and Pertendi Bore in Ngarkat Conservation Park, South Australia. Other sites (without water) include Red Bluff and Black Box Flat in Victoria, and Pine Hut Soak in Scorpion Springs Conservation Park in South Australia (figure 1).

- Prominent features may become degraded by over-use if they become key destinations for large numbers of walkers.

- Commercial tour operations based on appropriate self-reliant recreation (see above) are permitted in the Wilderness.

- For many people, campfires are an integral part of their wilderness experience. However, the small dimensions of fallen timber in the Wilderness necessitates the use of large quantities to maintain a campfire. Nevertheless, the number of visitors, and hence the amount of firewood consumed, is currently very low.

- Most visitors avoid the hotter months, so the likelihood of a wildfire starting from a campfire escape is negligible.

- Border Track - see section 9.2.

Aims

- Provide for self-reliant recreation and promote the need to accept the Big Desert Wilderness on its own terms.

- Encourage minimum impact use of the Big Desert Wilderness and adjacent areas.

Actions

1 Encourage the use of the following camping areas outside the Big Desert Wilderness as starting points for wilderness excursions:

   - Big Billy Bore;
   - Broken Bucket Tank;
   - Red Bluff;
   - Black Box Flat;
   - Pertendi Bore (South Australia);
   - Pine Hut Soak (South Australia).

2 Develop appropriate site prescriptions for Big Billy Bore, Broken Bucket Tank, Red Bluff and Black Box Flat camping areas to ensure that their conservation and remote recreation values are protected.

3 Avoid promoting particular routes or destinations within the Big Desert Wilderness so as to avoid placing undue pressure on certain features, and to retain the opportunity for visitors to discover the area for themselves.

4 Encourage visitors to use solid or liquid fuel stoves whenever possible.

5 Encourage walkers to become familiar with and adhere to the Wilderness Walkers Code - Desert Parks, when published. (8.2/3)

8.2 PUBLIC SAFETY AND VISITOR INFORMATION

Major management considerations

- Lack of water, high summer temperatures, and few distinguishing features make the Big Desert Wilderness a potentially dangerous place for uninformed or ill-equipped, inexperienced walkers.

- The high iron content of rock outcrops can cause erroneous compass readings.

- The main visitor information on the Wilderness is limited to an A4 leaflet available at CNR offices. There is also an information shelter at the junction of Murrayville and Chinaman Flat tracks that contains general information about the Mallee Parks.

- SADENR has produced an information leaflet for the Ngarkat group of conservation parks.

- CNR has prepared a coloured map of the Victorian Mallee Parks, which includes the Big Desert Wilderness.

Aims

- Inform the public of the potential dangers involved in walking in the Big Desert Wilderness.

- Increase the availability of appropriate information on the Big Desert Wilderness, including natural history.

Actions

1 Provide information on the Big Desert Wilderness at Broken Bucket Tank, at the junction of Murrayville and Chinaman Flat tracks and, in conjunction with the SADENR, at Pertendi Bore, including:
   - the potential dangers involved in wilderness recreation;
   - safety aspects that should be considered;
   - minimum impact use and appropriate behaviour;
   - natural values.

2 Encourage overnight visitors to notify the Ouyen or Hopetoun CNR offices of their intentions.

3 Publish a Wilderness Walkers Code - Desert Parks which includes advice on walking and camping in wilderness areas in the semi-arid parts of the State. In preparing the Code for publication, take into account comments received on the proposed Code included as appendix 2 in the Big Desert Wilderness Park Proposed Management Plan (DCE 1991).

4 Encourage visitors to become familiar with the Code by making it freely available at relevant CNR and SADENR offices and other relevant outlets.

5 Update the Big Desert Wilderness information leaflet to include recent additions and management prescriptions.

6 Make information on the Ngarkat group of conservation parks available through CNR outlets.

8.3 SEARCH AND RESCUE

Major management considerations

- Responsibility for search and rescue operations rests with the Victoria Police, although CNR may play a support role through DISPLAN, the State's Disaster Plan, which includes search and rescue operations.

- CNR has a Search and Rescue Plan for the former Mildura Region (Regional Instruction 01/89/01/001).

Aim

- Provide support for authorities involved in dealing with emergencies.

Actions

1 Carry out search and rescue operations in accordance with CNR Mildura Regional Instruction 01/89/01/001, and co-operate with emergency authorities if and when DISPLAN is activated.

2 Allow management vehicles to use former tracks and helicopters to land for search and rescue purposes, if considered critical to the safety of persons within the area.

3 Rehabilitate any disturbance caused in the course of search and rescue operations.

9 OTHER MANAGEMENT CONSIDERATIONS

9.1 CO-OPERATIVE MANAGEMENT WITH SOUTH AUSTRALIA

Major management considerations

- The Big Desert Wilderness and adjacent conservation parks in South Australia together form part of a contiguous area of very high nature conservation significance.

- CNR and SADENR are both represented on the Mallee Border Fire Liaison Committee, which meets twice a year to ensure the maintenance of close liaison and awareness of policies, procedures and matters of mutual interest in regard to fire.

- A management liaison committee, comprising CNR and SADENR personnel, has been established to promote co-operative management of the Big Desert Wilderness and the adjacent South Australian conservation parks on matters other than fire.

- The exact location of the State border west of the vermin-proof fence is currently being determined by survey being carried out by Victoria and South Australia.

Aim

- Ensure that the Big Desert Wilderness and the South Australian conservation parks are managed in a complementary and co-operative manner.

Actions

1 Continue to liaise with SADENR on co-operative and complementary management of the Big Desert Wilderness and adjacent South Australian conservation parks, including Border Track. (6.2/5, 9.2)

2 Investigate the feasibility of cross-border authorisation for field staff. (9.4/2)

9.2 BORDER TRACK

Major management considerations

- Use of Border Track for 4WD touring is increasing. Vegetation has been destroyed or damaged by vehicles traversing the steep dunes along the track, causing erosion and degrading habitat. This is particularly the case on the southern faces of several big dunes, which are generally steeper.

- The exact location of Border Track in relation to the State border is currently being surveyed, although current indications from the survey are that the border is almost entirely west of the track.

- In conjunction with the SADENR, a three-year trial of north-to-south only access between Scorpion Springs Southern Boundary Track and Nannums Well-Scorpion Springs Track (figure 1) has recently been introduced. Access for northbound traffic is via Scorpion Springs Centre Track, where the dunes are not as steep and there is less likelihood of damage.

- An information leaflet has been prepared on the Ngarkat group of conservation parks by SADENR detailing access, including the north-to-south only route. The one-way access has also been included in a recent touring publication on the Mallee country (Sheedy 1993).

Aims

- Provide for four-wheel drive touring along Border Track.

- Reduce the damage being caused by vehicles to dunes along the Border Track.

- Rehabilitate eroded sections of the dunes along Border Track.

Actions

1 In conjunction with SADENR, continue the three-year trial of north-south access along Border Track.

2 Establish, in collaboration with the Victorian and South Australian Associations of Four Wheel Drive Clubs and SADENR, appropriate criteria for assessing the effectiveness or otherwise of the trial.

3 Following an evaluation of the trial and in collaboration with the groups referred to above, determine a long-term management strategy for 4WD use of the Border Track to reduce damage to sensitive areas along the track. Options may include continuing the one-way access along the whole length of Border Track, or introducing one-way access on dual tracks over or around the dunes of concern.

4 Undertake programs to rehabilitate badly eroded sections of dunes and braided tracks, and advise the Victorian and South Australian Associations of Four Wheel Drive Clubs of the proposed times of these works.

5 Inform users of the trial one-way access along Border Track and of any temporary track closures which may be necessary during periods of maintenance.

9.3 MONITORING

Major management consideration

- Monitoring programs assist managers to make better informed decisions on land management issues.

Aims

- Collect data which will enable managers to implement the most appropriate actions to protect or enhance the values of the Big Desert Wilderness.

- Determine the ecological impacts of visitor use and other land management practices, such as fire management.

Action

1 Establish programs to monitor the following:

- visitor numbers (e.g. through the use of visitor books at locations such as Big Billy);
- dispersal patterns from, and the impact of visitor use on, nominated camping sites;
- re-establishment of vegetation on tracks (7.1/2, 7.1/4, 7.1/5);
- effectiveness of the management strategy for reducing damage to the dunes on Border Track (9.2/2);
- the effects of fire management, in particular strip burning. (This need not necessarily be done in the Big Desert Wilderness, but in other areas of the Big Desert that are considered representative.) (7.3/8);
- the presence of introduced plants and animals (7.2/1);
- illegal uses.

9.4 CONTROL OF ILLEGAL ACTIVITIES

Major management considerations

- The wilderness provisions of the National Parks Act prohibit various activities within the Big Desert Wilderness (except in specified circumstances). These include the use of motorised or mechanical transport, horses and other introduced animals, hunting and commercial activities (other than appropriate recreation tours).
- The Broombush industry has been recently phased out in Victoria, but illegal harvesting may occur in the Big Desert Wilderness because of its remote nature.
- The low height and nature of the vegetation makes it relatively easy for 4WD vehicles to venture off tracks. Attempts to prevent vehicular access on closed tracks within the Big Desert Wilderness have failed in the past.

Aim

- Prevent illegal activities, especially off-road driving, driving on closed tracks and Broombush harvesting.

Actions

1 Ensure through public education that visitors are aware of the activities permitted in the Big Desert Wilderness. (8.2/1)

2 Investigate the feasibility of cross-border authorisations for field staff so as to effectively increase on ground management levels and reduce the possibility of illegal activities occurring. (9.1/2)

BIBLIOGRAPHY

Bardwell, S. 1980, Interim Management Plan - Big Desert Wilderness, National Parks Service, Victoria, unpub.

Bennett, A.F., Lumsden, L.F. & Menkhorst, P.W. 1989, Mammals of the Mallee, in Noble, J.C. & Bradstock, R.A. (eds), *Mediterranean Landscapes in Australia: Mallee Ecosystems and Their Management*, CSIRO Australia.

Bradstock, R., Sanders, J. & Tegart, A. 1987, Short-term effects on the foliage of a eucalypt forest after an application of a chemical fire retardant, *Australian Forestry* **50** (2): 71-80.

CFL 1987, *Recreation Facilities Manual*, Department of Conservation, Forests and Lands, Victoria.

Cheal, P.D., Day, J.C. & Meredith, C.W. 1979, *Fire in the National Parks of North-West Victoria*, National Parks Service, Victoria.

CNR 1992, *Regional Fire Protection Plan - Mildura Region*, Department of Conservation and Natural Resources, Victoria.

CNR 1993, *Mallee Tourism and Recreation Strategy*, Department of Conservation and Natural Resources, Victoria.

CONCOM Working Group on Management of National Parks 1986, *Guidelines for Reservation and Management of Wilderness Areas in Australia*, Council of Nature Conservation Ministers.

Cropper, S. 1991, *The Resource Evaluation and Monitoring System*, National Parks and Public Land Division, Department of Conservation and Environment, Victoria.

DCE 1991, *Big Desert Wilderness Park Proposed Management Plan*, Mildura Region and National Parks and Public Land Division, Department of Conservation and Environment, Victoria.

Douglas, F. 1993, The conservation, status, distribution and habitat requirements of diurnal Lepidoptera in Central and Western Victoria. Part 1: Family Castniidae; Part 2: Family Zygaenidae, Arctiidae and Noctuidae; Part 3: Family Hesperiidae. Report prepared under the Australian Heritage Commission National Estate Grants Program, unpub.

Emison, W.B. & Bren, W.M. 1989, Common birds of the Mallee, northwestern Victoria, in Noble, J.C. and Bradstock, R.A. (eds) *Mediterranean Landscapes in Australia: Mallee Ecosystems and Their Management*, CSIRO Australia.

Feller, M., Hooley, D., Dreher, T., East, I. & Jung, R. 1979, *Wilderness in Victoria: An Inventory*, Department of Geography, Monash University, Melbourne.

Gill, A.M. 1990, Fire management of mallee lands for species conservation, in Noble, J.C., Joss, P.J. & Jones, G.K. (eds), *The Mallee Lands: A Conservation Perspective*, CSIRO Australia.

Gullan, P.K., Cheal, D.C & Walsh, N.G. 1990, *Rare or Threatened Plants in Victoria*, Department of Conservation and Environment, Victoria.

Heddle, E.M. & Specht, R.L. 1975, Dark Island Heath (Ninety-mile Plain, South Australia). VIII The effect of fertilizers on composition and growth, 1950-1972, *Australian Journal of Bot*any **23:** 151-63.

Joyce, E.B. & King, R.L. 1980, *Geological Features of the National Estate in Victoria*, Geological Society of Australia Inc., Victoria.

Kenyon, A.S. 1912, *The Story of the Mallee*, Wood Publications, Rainbow.

LCC 1977, *Mallee Study Area Final Recommendations,* Land Conservation Council, Melbourne.

LCC 1987, *Mallee Area Review Descriptive Report*, Land Conservation Council, Melbourne.

LCC 1989, *Mallee Area Review Final Recommendations,* Land Conservation Council, Melbourne.

LCC 1990, *Wilderness Special Investigation Descriptive Report*, Land Conservation Council, Melbourne.

LCC 1991, *Wilderness Special Investigation Final Recommendations*, Land Consevation Council, Melbourne.

Lunney, D., Triggs, B., Eby, P. & Ashy, E. 1990, Analysis of scats of Dogs *Canis familiaris* and Foxes *Vulpes vulpes* (Canidae: Carnivora) in coastal forests near Bega, New South Wales, *Australian Wildlife Research* **17**: 61-8.

Mallee Dryland Community Salinity Working Group 1993, *Mallee Dryland Draft Salinity Management Plan*, MDCSWG, Ouyen.

McMahon, A. 1977, The effect of fire on heath floristics in the Little Desert National Park, Victoria, B.Sc. (Hons) thesis, La Trobe University, Melbourne.

Menkhorst, P.W. 1982, Pitfall trapping of reptiles in the Big Desert, Victoria, *Victorian Naturalist* **99**(2): 66-70.

Morcom, L. & Westbrooke, M. 1988, *Vegetation of the Big Desert Wilderness*, Department of Applied Biology, Ballarat College of Advanced Education, Ballarat.

Mutch, R.W. 1970, Wildland fires and ecosystems: a hypothesis, *Ecology* **51**: 1046-51.

Noble, J.C. 1989, Fire regimes and their influence on herbage and mallee coppice dynamics, in Noble, J.C. & Bradstock, R.A. (eds), *Mediterranean Landscapes in Australia: Mallee Ecosystems and Their Management*, CSIRO Australia.

NPS 1993, *National Parks and Conservation Reserves, Guidelines and Procedure Manual*, National Parks Service, Department of Conservation and Natural Resources, Melbourne.

O'Brien, T.P. 1989, The impact of severe frost, in Noble, J.C. & Bradstock, R.A. (eds), *Mediterranean Landscapes in Australia: Mallee Ecosystems and Their Management*, CSIRO Australia.

Parsons, R.F. and Browne, J.H. 1982, Causes of plant species rarity in semi-arid southern Australia, *Biological Conservation* **24**: 183-92.

Paton, D.C. 1990, Budget for the use of floral resources in Mallee-Heath, in Noble, J.C. & Bradstock, R.A. (eds), *Mediterranean Landscapes in Australia: Mallee Ecosystems and Their Management*, CSIRO Australia.

Paton, D.C. 1993, Honey Bees in the Australian environment. Does *Apis mellifera* disrupt or benefit the native biota? *Bioscience* **43**(2): 95-103.

Preece, K. & Lesslie, R. 1987, *A Survey of Wilderness Quality in Victoria*, Ministry for Planning and Environment, Victoria & Australian Heritage Commission.

Robertson, P., Bennett, A.F., Lumsden, L.F., Silveira, C.E., Johnson, P.G., Yen, A.L., Milledge, G.A., Lillywhite, P.K. & Pribble, H.J. 1989, Fauna of the Mallee Study Area North-western Victoria, Technical Report Series No. 87, Arthur Rylah Institute for Environmental Research, Department of Conservation, Forests and Lands, Victoria.

Ross, A. 1987, Aboriginal land use in the Mallee District of North Western Victoria**,** Report to the Land Conservation Council, Victoria.

Sheedy, B. 1993, *Discovering Mallee Country*, Roadwrite, Fitzroy.

Ward, A.C. and Associates 1986, Mallee Area Review - Study of Historic Sites, Report to the Land Conservation Council, Victoria.

APPENDIX 1 MAIN WILDERNESS MANAGEMENT PROVISIONS OF THE NATIONAL PARKS ACT RELATING TO THE BIG DESERT WILDERNESS

"**17A. Wilderness Parks - Schedule Two A**

(1) Each area of land described in a part of Schedule Two A is, for the purposes of this Act, a wilderness park under the name specified in that part.

(2) The Director must ensure that each wilderness park is controlled and managed in accordance with the objects of this Act in a manner that will protect and enhance the park as a wilderness including, insofar as is practicable and appropriate, the taking of measures -

(a) to preserve and protect -
(i) the natural environment including indigenous flora and fauna and features of ecological, geological or scenic significance; and
(ii) features of archaeological or historic significance; and
(iii) features of scientific significance; and

(b) for the eradication or control of non-indigenous flora and non-indigenous fauna; and

(c) for the control of indigenous fauna to the extent necessary for the preservation and protection of any species; and

(d) subject to paragraph (a), for the removal of evidence of developments of non-aboriginal origin.

(3) Subject to sub-section (2), the Director -

(a) must ensure that opportunities are provided for solitude and appropriate self-reliant recreation in a wilderness park; and

(b) must promote the understanding and appreciation of the purpose and significance of wilderness and the proper use of wilderness by the public.

"**17C. Prohibition on development and other activities**

(1) The Director must ensure that in a wilderness park -

(a) there are no roads, structures or installations; and

(b) no commercial activity or development is carried out; and

(c) there is no use of any form of motorized or mechanical transport; and

(d) there is no use of any non-indigenous animal; and

(e) there is no hunting.

(2) Sub-section (1) does not apply to -

(a) any road, structure or installation or any use of motorized or mechanical transport or any use, control or destruction of non-indigenous animals which the Director considers is essential for the responsible management of the park; or

(b) permanent survey markers existing at the date of commencement of section 6 of the *National Parks (Amendment) Act 1989*; or

(c) any commercial tours or activities not involving motorized or mechanical transport or the use of animals which the Director considers is appropriate for the appreciation and understanding of wilderness; or

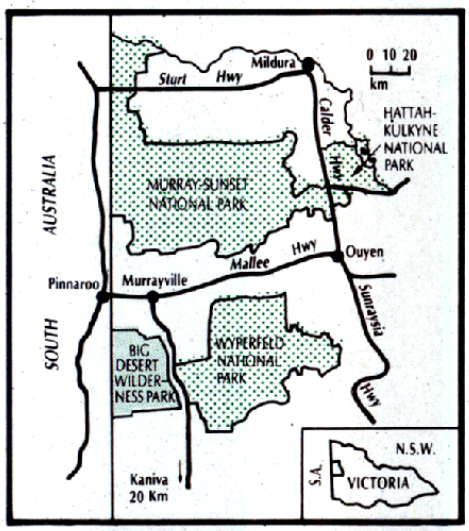
(d) any non-commercial mechanical activity approved by the Director; or

(e) any scientific investigation or study of wilderness parks which the Director considers is appropriate and does not affect the value of the area as wilderness and cannot be carried out elsewhere; or

(f) any measures which the Director considers are necessary to provide for the health and safety of persons within the area, the prevention and control of fire or emergencies relating to the control of diseases; ...

"(3) In a wilderness park, the Director may carry out works and maintenance necessary to enable anything permitted under sub-section (2) to be done and, where degradation has occurred as a result of essential management activities, must undertake rehabilitation as soon as practicable."

FIG. 1
BIG DESERT WILDERNESS PARK



Park Boundary
State Border
Highway
Sealed Road
Surfaced Road
Track/or Earth Road
Trial border route NORTH TO SOUTH ONLY

Wilderness Park
Wilderness Zone
Other Parks and Reserves
Other Public Land

Toilets
Water Points
Information

Pinnaroo
Murrayville
SOUTH AUSTRALIA
VICTORIA
Black Box Flat
Murrayville Track
Little Billy
Big Billy Bore
Pine Hut Soak
Nannums Well - Scorpion Springs Track
Scorpion Springs Centre Track
SCORPION SPRINGS CONSERVATION PARK
Hensleys Range Trig. Point
Border
NINETY MILE DESERT
BIG DESERT
Milmed Rock Track
BIG DESERT WILDERNESS PARK
Mesa Track
The Springs
Pertendi Bore 9 km
Scorpion Springs Southern Boundary Track
NGARKAT CONSERVATION PARK
'Kirra'
WYPERFELD
SOUTH WYPERFELD WILDERNESS ZONE
NATIONAL PARK
Chinaman Well Track
WYPERFELD
Murrayville Track
CHINAMAN FLAT WILDERNESS ZONE
NATIONAL PARK
MT SHAUGH CONSERVATION PARK
Red Bluff
RED BLUFF FLORA & FAUNA RESERVE
TELOPEA DOWNS REFERENCE AREA
Wagon Flat
Arthurs Road
Taylors Road
Chappel Road
Red Bluff Road
Broken Bucket Track
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