

KEMENDOK NATURE RESERVE

PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

Part of the Department of Environment and Climate Change

January 2009

This plan of management was adopted by the Minister for Climate Change and the Environment on 12th January 2009.

Acknowledgments

This plan of management is based on a draft plan prepared by staff of the Lower Darling Area, Far West Region of NPWS.

Valuable information and comments were provided by:

- Mr Jim Maynard, owner of Kerribee Station; and the
- Far West Region Advisory Committee.

Cover photograph by Ray Dayman, NPWS.

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FOREWORD

Kemendok Nature Reserve is located adjacent to the Murray River, 50 kilometres east of Buronga in south-western NSW. The reserve covers 1,064 hectares and borders Mallee Cliffs State Forest on its northern, eastern and southern sides.

Kemendok Nature Reserve was dedicated primarily to protect a remnant of river red gum/black box woodland and the endangered regent parrot which requires this habitat for its survival. It also contains old man saltbush shrublands, a community which is restricted in distribution and has been provisionally listed by the NSW Scientific Committee as an endangered ecological community in western NSW, and six threatened animal species.

The reserve also contains Aboriginal scarred trees and a number of interesting and locally significant historic sites.

The New South Wales *National Parks and Wildlife Act 1974* requires that a plan of management be prepared for each nature reserve. A plan of management is a legal document that outlines how an area will be managed in the years ahead.

A draft plan of management for Kemendok Nature Reserve was placed on public exhibition from 19th October 2007 until 21st January 2008. The submissions received were carefully considered before adopting this plan.

This plan contains a number of actions to achieve “Better environmental outcomes for native vegetation, biodiversity, land, rivers, and coastal waterways” (Priority E4 in the State Plan) including surveys for regent parrot nests and for koalas, upgrading of the fencing around the old man saltbush community, and preparation of a weed control plan.

This plan of management establishes the scheme of operations for Kemendok Nature Reserve. In accordance with section 73B of the *National Parks and Wildlife Act 1974*, this plan of management is hereby adopted.

Carmel Tebbutt MP
Deputy Premier
Minister for Climate Change and the Environment

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1. MANAGEMENT CONTEXT

1.1 LEGISLATIVE AND POLICY FRAMEWORK

The management of nature reserves in NSW is in the context of a legislative and policy framework, primarily the *National Parks and Wildlife Act 1974* (NPW Act), the NPW Regulation, the *Threatened Species Conservation Act 1995* (TSC Act) and the policies of the National Parks and Wildlife Service (NPWS). Section 72AA of the NPW Act lists the matters to be considered in the preparation of a plan of management. The policies arise from the legislative background and internationally accepted principles of park management. They relate to nature conservation, Aboriginal and historic heritage conservation, recreation, commercial use, research and communication.

Other legislation, international agreements and charters may also apply to management of the area. In particular, the *Environmental Planning and Assessment Act 1979* (EPA Act) requires the assessment and mitigation of the environmental impacts of any works proposed in this plan.

A plan of management is a statutory document under the NPW Act. Once the Minister has adopted a plan, no operations may be undertaken within the Nature Reserve except in accordance with the plan. The plan will also apply to any future additions to the nature reserve. Where management strategies or works are proposed for the nature reserve or any additions that are not consistent with this plan, an amendment to the plan will be required.

1.2 MANAGEMENT PURPOSES AND PRINCIPLES

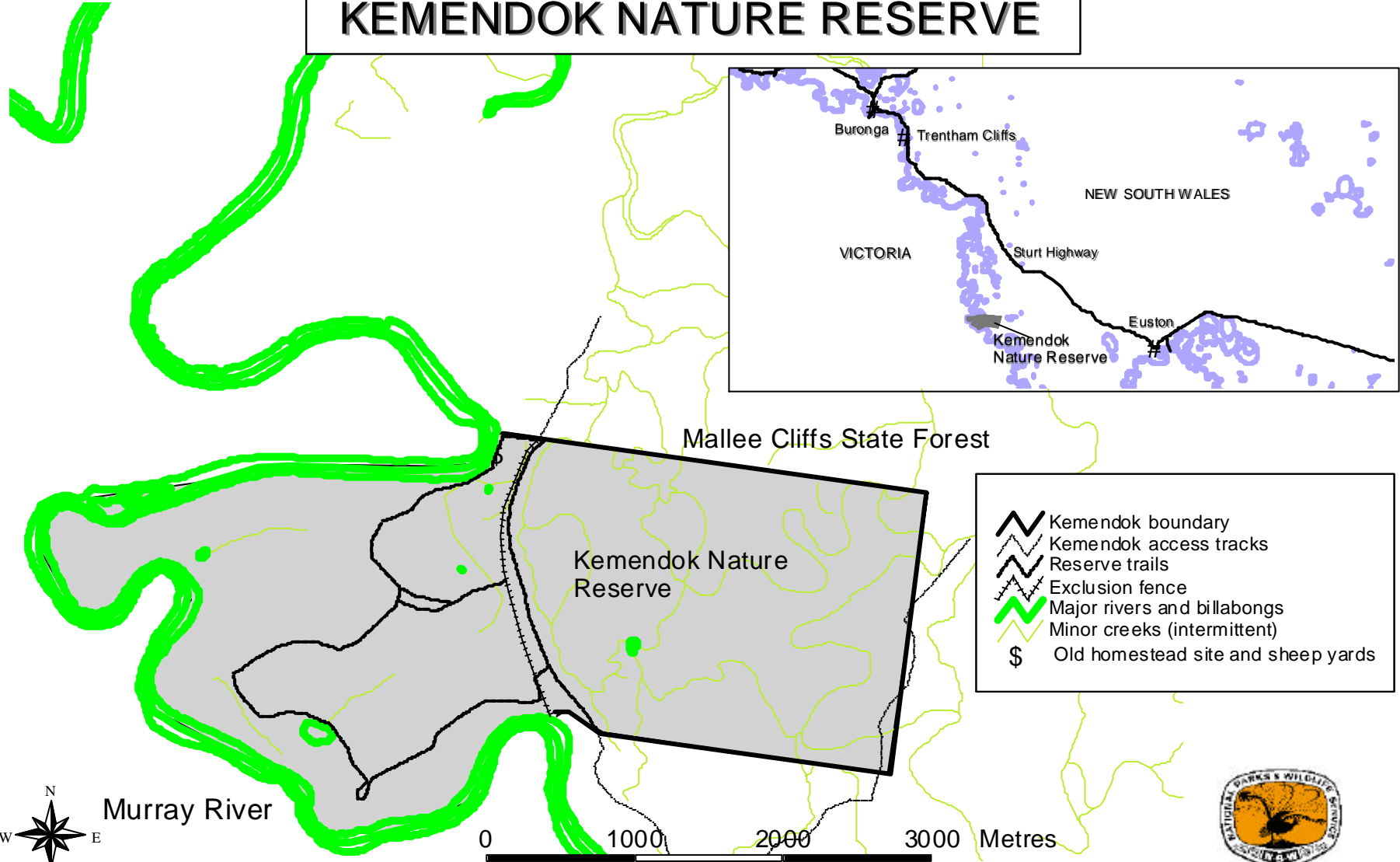
Nature reserves are reserved under the NPW Act to protect and conserve areas containing outstanding, unique or representative ecosystems, species, communities or natural phenomena.

Under the Act, nature reserves are managed to:

- conserve biodiversity, maintain ecosystem functions, and protect geological and geomorphological features and natural phenomena;
- conserve places, objects, features and landscapes of cultural value;
- promote public appreciation, enjoyment and understanding of the reserve's natural and cultural values; and
- provide for appropriate research and monitoring.

Nature reserves differ from national parks in that they do not have as a management principle to provide for visitor use.

KEMENDOK NATURE RESERVE



2. KEMENDOK NATURE RESERVE

2.1 LOCATION, GAZETTAL AND REGIONAL SETTING

Kemendok Nature Reserve is located adjacent to the Murray River, 50 kilometres east of Buronga in south-western NSW. The reserve encompasses 1,064 hectares and was gazetted as a nature reserve on the 9th March 1988. The reserve is bordered by Mallee Cliffs State Forest on the northern, eastern and southern sides and by the Murray River to the west. The reserve lies within the Wentworth Shire and the nearest sizeable towns are Euston, Wentworth and Balranald in NSW, and Mildura and Robinvale in Victoria. The surrounding district is used mainly for sheep and cattle grazing and red gum timber harvesting.

The reserve lies within the Lower Murray Darling Catchment Management Authority boundary. The Lower Murray Darling Catchment Management Authority (LMD CMA) delivers funding from the NSW and Australian Governments and other sources to help land managers improve and restore the natural resources of the catchment. The LMD CMA is a statutory organisation established by the NSW Government in 2004. It is overseen by a community-based Board.

The reserve was dedicated primarily to protect a remnant of river red gum *Eucalyptus camaldulensis* / black box *Eucalyptus largiflorens* woodland and the endangered regent parrot *Polytelis anthopeplus* which requires this habitat for its survival.

National parks and other conservation areas near Kemendok Nature Reserve include Hattah-Kulkyne National and Regional Parks, Murray-Sunset National Park in Victoria, and various private lands within NSW which are managed for conservation purposes.

2.2 IMPORTANCE OF KEMENDOK NATURE RESERVE

Biological values

The native vegetation of western NSW has declined markedly in many areas because of clearing, logging and grazing, resulting in widespread habitat loss. Kemendok Nature Reserve although small in size provides protection for several vegetation communities that have a restricted distribution and/or are poorly conserved.

Significant vegetation associations within the reserve include:

- River red gum *Eucalyptus camaldulensis* / black box *Eucalyptus largiflorens* woodland, which is poorly conserved Australia wide.
- Old man saltbush *Atriplex nummularia* shrubland, which has been provisionally listed by the NSW Scientific Committee as an endangered ecological community in western NSW.

The native vegetation of the reserve supports a diverse array of native animals and the reserve is a major habitat for several threatened species, particularly those that rely on mature river red gums and associated hollows. Threatened species recorded in the reserve are listed in the table below. The reserve is particularly rich in avifauna, including several species that have a limited distribution in NSW. The reserve is also known to protect populations of the carpet python *Morelia spilota* which is of conservation concern in NSW. (Sadler and Pressey, 1993)

Threatened Native Animal Species Recorded in Kemendok Nature Reserve

Endangered Species (Schedule 1)	Vulnerable Species (Schedule 2)
Regent parrot <i>Polytelis anthopeplus monarchoides</i>	Pink cockatoo <i>Cacatua leadbeateri</i>
	Gilberts whistler <i>Pachycephala inornata</i>
	Striated fieldwren <i>Calamanthus fuliginosus</i>
	Black-breasted buzzard <i>Hamirostra melanosternon</i>
	Koala <i>Phascolarctos cinereus</i> – identified by presence of scats only

Cultural values

Little is known about former Aboriginal use of Kemendok. Several scarred trees have been located in the reserve and the reserve has the potential to add to knowledge about Aboriginal use and occupation in riverine environments. The reburial of human remains has occurred within the reserve on two occasions.

The reserve also contains structures of local historic significance from its former use for stock grazing, including post and rail yards, remnant fencelines and an old red gum roller which was used to break up clods of clay after ploughing.

3. SPECIFIC OBJECTIVES FOR MANAGEMENT OF KEMENDOK NATURE RESERVE

In addition to the general management principles for nature reserves (refer section 1.2), management of Kemendok Nature Reserve will aim to:

- * Conserve the endangered regent parrot *Polytelis anthopeplus* population within the reserve;
- * Conserve the old man saltbush *Atriplex nummularia* community within the reserve;
- * Control and where possible eradicate pest species; and
- * Encourage opportunities for research, especially into the flora and fauna of the reserve.

4. POLICIES AND FRAMEWORK FOR MANAGEMENT

This section contains the policies and framework for the management of Kemendok Nature Reserve together with relevant background information. Policies are summarised under the following section headings:

- 4.1 Natural Heritage
- 4.2 Cultural Heritage
- 4.3 Use of the Reserve

Natural heritage, cultural heritage and use are presented individually for convenience and clarity. In practice, however, they are strongly linked and together form the landscape of an area. Much of the Australian environment has been influenced by past Aboriginal and non-Aboriginal land use practices and the activities of modern day Australians continue to influence natural vegetation through recreational use, cultural practices, the presence of introduced plants and animals and in some cases air and water pollution.

4.1 NATURAL HERITAGE

Natural heritage comprises all aspects of the natural environment including physical features such as geology and soils, plants and animals and the relationship between these. For convenience management of fire is also considered in this section.

4.1.1 Landform, Soils and Climate

Kemendok Nature Reserve contains landforms typical of the Murray floodplain, with heavy black soils on relatively flat plains dissected with numerous channels and billabongs that are inundated during peak floods. Two major land systems are present within the reserve (Walker, 1991). These are: Riverland (70% of reserve area), which comprises the Murray River and adjacent floodplain area, predominately located in the west, east and southern portions of the reserve, and Murrumbidgee (30% of reserve area), which comprises the higher terrace areas located in the centre of the reserve. Geomorphology, soils and erosion potential of these landsystems are outlined below.

Riverland

Geomorphology – floodplain of grey fine textured Quaternary alluvium with sinuous perennial channels, back channels and billabongs; elevated levees of browner alluvium' relief to 3 metres; riverside lunettes, relief to 10 metres.

Soils – Plain with cracking and non-cracking clays, levees with texture contrast soils, lunettes of deep calcareous sands.

Erosion – Severe scalding of levees; localized gullyng of river banks.

Murrumbidgee

Geomorphology – Floodplain of grey fine-textured Quaternary alluvium with small rises, relief to three metres; backplains, scalded levees and swamps. Riverside lunettes of deep sands; relief to ten metres. Irregularly inundated by flooding.

Soils – Plains with grey cracking and non-cracking clays; lunettes and rises of deep brownish sands; backplains of scalded yellow texture-contrast soils.
Erosion – Severe scalding of levees, localized gullyng of river banks.

The general climate in the area of the reserve consists of hot, dry summers and cooler dry winters. It is, however, an area subject to extremes in climatic variability with a high incidence of climatic extremes. Extremes of temperature, evaporation, rainfall and winds can have a marked effect on the vegetation, fauna, landform stability and surface water.

Bureau of Meteorology long term trend data for Euston, NSW, indicates that the mean annual rainfall is 311mm with a slight winter dominance. Average temperatures reach a high of 32.5 in January and 15.8 in July, while average minimum temperatures reach 15.8 in January and 3.2 in July, however seasonal variations are common and can be extreme.

Climatic variations also play an important role in the flooding regimes affecting the Murray River and Kemendok Nature Reserve and are critically important to this ecosystem.

4.1.2 Native and Introduced Plants

Native Plants

The vegetation of Kemendok Nature Reserve can be divided into four major groups, river red gum tall open forest, blackbox – lignum woodland, old man saltbush shrubland and nitre goosefoot shrubland.

The major vegetation communities can be summarised as follows:

- River red gum *Eucalyptus camaldulensis* tall open forest, which primarily occurs on river banks and associated tributaries. The community is dominated by river red gum to 20 metres with patches of river cooba *Acacia stenophylla*. The understorey is generally sparse but often contains nitre goosefoot *Chenopodium nitrariaceum*, ruby saltbush *Enchylaena tomentosa* and lignum *Muehlenbeckia cunninghamii*. In most areas ground cover species are absent or in low numbers.
- Black box *Eucalyptus largiflorens* - lignum *Muehlenbeckia cunninghamii* woodland occurs on alluvial plains subject to periodic inundation. Black box is the dominant canopy species. A dense shrub layer often comprising old man saltbush *Atriplex nummularia*, nitre goosefoot, lignum and dillon bush *Nitraria billardieri* is evident in some areas, in other areas of the reserve the shrub layer is discontinuous. Ground cover species include cannonball *Dissocarpus paradoxus*, creeping boobialla *Myoporum parvifolium*, and various *Scleroleana* species.

- Old man saltbush shrubland occurs on alluvial plains, usually in conjunction with more saline soils. The dominant species is old man saltbush to 2.5 metres high with nitre goosefoot also present in some areas. Rounded noon-flower *Disphyma crassifolium* is commonly the predominant ground layer species in this community.
- Nitre goosefoot *Chenopodium nitrariaceum* shrubland occurs on alluvial plains which are subjected to periodic flooding. This community may be derived from a previous old man saltbush shrubland as it generally occurs in disturbed areas (Benson et al, 2006) which is the case within Kemendok Nature Reserve. This community is similar in composition to the old man saltbush shrubland discussed above.

River red gum and black box woodland are poorly represented in the protected area system in New South Wales (Benson et al, 2006). Kemendok Nature Reserve contains one of the few areas of river red gum woodland reserved adjacent to the Murray River in New South Wales. A much larger area of river red gum woodland (approximately 18,000 hectares) has recently been reserved within Yanga National Park on the Murrumbidgee River and a small area of this community is also reserved within Kinchega National Park on the Darling River. It is estimated by Benson, 2006 that collectively these reserves protect only 10% of the extent of river red gum - lignum tall open forest in New South Wales. The proportion of black box – lignum woodland that is reserved is less than that of river red gum. The conservation status of both communities in Australia is considered poor.

The old man saltbush shrublands found within the reserve, although relatively small (250 hectares) in size and extent are considered to be highly significant, as this community is restricted in distribution and poorly represented in conservation reserves. Benson et al (2006) estimates that the old man saltbush community occupies between 4.3% - 15% of its former pre-European range and less than 1% lies within formally protected areas. This community is critically endangered in the western division of New South Wales (Benson et al, 2006) and is facing a very high risk of extinction in NSW in the near future (NSW Scientific Committee Preliminary Determination, 2006).

Introduced plant species

An introduced species is defined in this plan as any plant or animal species not native to the area. Introduced species within the reserve and on adjoining land are of concern because they have the potential to have detrimental effects on ecological values and can spread to and from neighbouring land. Introduced plant species may be declared noxious under the *Noxious Weeds Act 1993*. The Act places an obligation upon public authorities to control noxious weeds on land that they occupy to the extent necessary to prevent such weeds spreading to adjoining lands.

Introduced plant species within the reserve include horehound *Marrubium vulgare*, African boxthorn *Lycium ferocissimum*, noogoora burr *Xanthium pungens*, prickly pear *Opuntia spp.*, all of which are listed as noxious weeds within the Wentworth Shire and various pasture species. They predominantly occur along roadsides and fencelines,

although noogoora burr is common adjacent to the Murray River where its seed is carried and deposited in times of flood. Weeds will be treated primarily via the spraying of herbicide. Manual removal will be used on species that are confined to small areas of the reserve.

It is anticipated that the continued exclusion of domestic stock from the reserve, combined with ongoing treatment programs will reduce the occurrence of weed species in the reserve.

4.1.3 Native and Introduced Animals

Native animals

No long-term or ongoing fauna or flora surveys have been conducted within the reserve. The limited survey work that has been undertaken within the reserve has identified an array of native animal fauna comprising 89 species of birds, 11 mammal species, 9 reptile species and 3 frog species (NSW Wildlife Atlas and NPWS records). It is highly likely that future fauna survey work within the reserve could substantially add to this data set.

Many species of birds are abundant within the reserve, particularly species such as the white-plumed honeyeater *Lichenostomus penicillatus*, yellow rosella *Platycercus elegans*, red-rumped parrot *Psephotus haematonotus*, laughing kookaburra *Dacelo novaeguineae* and corella *Cacatua sanguinea*. Waterbirds are also commonly encountered on billabongs and tributaries of the Murray River. Common species include the grey teal *Anas gracilis*, white faced heron *Ardea novaehollandiae* and darter *Anhinga melanogaster*.

Common mammal species within the reserve are the western grey kangaroo *Macropus fuliginosus*, common brushtail possum *Trichosurus vulpecula* and Gould's wattled bat *Chalinolobus gouldii*. It is believed that the reserve contains suitable habitat for many reptile species although these have not been well sampled. Common species known to inhabit the reserve include the lace monitor *Varanus varius*, sand goanna *Varanus gouldii* and tree dtella *Gehyra variegata*. The reserve is also known to contain populations of the carpet python *Morelia spilota* which is of conservation concern in NSW.

Threatened Species

Six threatened native animal species have been recorded from Kemendok Nature Reserve. These are listed in section 2.2.2.

The reserve is particularly important for the conservation of the regent parrot. It is estimated that the two statutory protected regent parrot nesting areas in NSW, Kemendok Nature Reserve and Peacock Creek Flora and Fauna Reserve, located approximately 20 kilometres east of Euston in NSW and administered by Forests NSW contain 21% of the NSW breeding population. The total NSW regent parrot population is currently estimated at 600-650 individuals. The regent parrot is known to forage

extensively in mallee vegetation communities which are often located a considerable distance from the reserve. The conservation of these foraging areas and the associated flight paths are also critical to the survival of the species. The Priority Action Statements (PAS) for the regent parrot include a number of actions to ensure the continued survival of the species in NSW. One action, “the annual monitoring of known nesting colonies within Kemendok Nature Reserve” relates specifically to the reserve and will be undertaken as a matter of priority.

Koalas have been recorded for the reserve through the evidence of scats and a dead specimen was recorded in the adjacent Mallee Cliffs State Forest (Parson 1991). Clarification of the status of the koala within the reserve and its surrounds is needed.

A number of threatened fish species occur within the Murray River adjacent to the reserve, including Murray cod and silver perch. During flooding events it is possible that inundated floodplains may support elements of the Lower Murray River Endangered Ecological Community.

The main requirements for management of most of the threatened species in the reserve are the protection of the riparian and sandplain environments from disturbance, particularly fire and visitor impacts and control of introduced animal species.

In the early 1990’s the Service conducted research into the status, breeding success and foraging habitat of the regent parrot and such research is ongoing.

Introduced species

Introduced animals of particular concern are rabbits *Oryctolagus cuniculus*, foxes *Vulpes vulpes*, feral cats *Felis catus*, starlings *Sturnus vulgaris*, pigs *Sus scrofa* and European honeybees *Apis sp.*

Traditionally, rabbits have been considered a major pest species in the reserve, however since the introduction of the calicivirus into the area in 1998 rabbit numbers have been relatively low. A substantial percentage of rabbits within the reserve reside above ground and therefore conventional harbour destruction techniques such as ripping are not feasible. Continued monitoring of the rabbit population will be necessary and control programs incorporating baiting and gassing will be implemented if the population increases to a point which threatens the flora of the reserve.

The impact of introduced avifauna, particularly starlings, on the regent parrot and other hollow dependent native species within the reserve is difficult to quantify. It is apparent that starlings and European honeybees utilise significant numbers of nesting hollows in the river red gum woodlands and may as a consequence be a limiting factor in the nesting success or otherwise of some bird species. Further research into the effects of competition for nesting hollows by introduced species is required before management action is initiated.

Feral cats can impact heavily on native fauna. Control of feral cats in densely wooded riverine environments is, however currently impractical. Trapping and shooting has

limited effect and is extremely labour intensive. Shooting at night with spotlights appears to be the most effective method at present although this technique is hampered by dense vegetation cover in some areas, the lack of access tracks and the close proximity of the reserve to the Murray River. Preliminary work has been undertaken to develop specifically designed cat baiting stations and subject to further research and approvals this technique may be suitable for use in Kemendok Nature Reserve. Effective biological control of feral cats has not been developed but current research may provide agents for such control in the longer term.

Feral pigs occur in the reserve predominantly along channels and billabongs, however not in large numbers. The impact of pigs on the reserve is minimal with most impact observed adjacent to water sources and consisting of scratching and wallowing on the margins.

Relatively low populations of foxes are known to occur within the reserve. The impact of foxes on the fauna within the reserve cannot be quantified however due to the relatively low numbers of foxes faunal impacts are possibly not significant.

Straying stock currently enter the reserve by two main avenues: along the riverbank during low river levels, and directly via the entrance gates when they are open. Stock tend to congregate around the billabong areas and graze the significant stands of old man saltbush. The NPWS will continue to liaise with neighbouring landholders in order to stop stock entering the reserve. The current exclusion fence around the old man saltbush (see map) requires upgrading and the locking of access gates into this portion of the reserve to exclude stock will be investigated.

4.1.4 Fire Management

Fire has been an important factor influencing the environment of Kemendok Nature Reserve for many tens of thousands of years. The National Parks and Wildlife Service regards fire as a natural process, one of the established physical factors of the Australian environment to which native plant and animal communities have become adapted. The correct management of fire is essential to avoid the extinction of native plant and animal species.

The natural fire regime of the reserve is not well known, however most of the floodplain forests and woodlands of western New South Wales have been affected by fire to some extent. Aboriginal fire management in riverine areas is likely to have reduced vegetative recruitment and encouraged formation of more open woodland environments as opposed to forests. Early European settlers are thought to have regularly burnt river bends to promote grass growth in order to assist grazing. This practice has continued to occur until relatively recent times in areas adjacent to the reserve, now forming part of Mallee Cliffs State Forest (Parsons, 1993). Today, "natural" fires are an infrequent occurrence within the riverine woodland due to the presence of light fuel loads. The main causes of ignition in the reserve are likely to be lightning strikes and escaped campfires from people camping illegally in the reserve. In Victoria, campfire escapes have been the major cause of fire in the riverine environment within the last ten years (CNR 1992).

Intense and even moderate fires in riparian environments can have serious environmental impacts. River red gum regeneration is highly susceptible to fire due to a lack of a lignotuber and older trees may be destroyed by fire. Black box is less susceptible, often re-sprouting from the basal lignotuber. The resultant loss of nesting hollows in riverine environments following fire can severely affect species dependent upon hollows for breeding and refuge.

The NPWS aims to eliminate non-natural fires from occurring within the reserve by providing public information signage and restricting public access, particularly to the sensitive river red gum areas. Natural fires, usually occurring through lightning strikes will be suppressed as soon as possible in order to minimise the loss of key habitat. However, containing fire in riverine environments can be problematic and dangerous. River red gums may burn for extended periods and fires within this community can be difficult to suppress. Patrolling and “mopping up” operations can prove to be particularly hazardous due to the danger of falling limbs and trees.

The NPWS regards cooperative fire management as essential for both the protection of property and of natural resources under its control. The Lower Western Zone Bush Fire Management Committee has been established under the *Rural Fire Service Act 1997* to develop and coordinate cooperative fire management between fire authorities. The National Parks and Wildlife Service is a member of this committee which is responsible for both the development of cooperative fire fighting and programs for the reduction of bush fire hazards.

The reserve contains several tracks (refer map) which may be used for fire related access. Mallee Cliffs State Forest also contains vehicle tracks, which can be used to access different areas of the reserve if required. The Murray River borders the reserve to the west providing a ready supply of water for fire fighting operations. Numerous creeks are also located within the reserve and these often contain water for long periods.

The NPWS Strategy for Fire Management (NPWS, 2003) utilises a system of bushfire management zones for bushfire management in NPWS reserves. This type of zoning is compatible with the system adopted by the Bushfire Coordinating Committee for use in District Bushfire Management Committee (DBFMC) bushfire risk management plans.

NPWS has assessed Kemendok Nature Reserve for planning purposes in regard to fire and has zoned the entire reserve as a Heritage Management Zone (HAMZ). It is considered that there is a low - medium risk of fire in the reserve. The primary fire management objectives within this zone are to prevent the extinction of all species that are known to occur naturally within the reserve, and to protect culturally significant Aboriginal and non-Aboriginal sites. The reserve has been designated as a HAMZ because it is not adjacent to built assets which would be exposed to a high level of bushfire risk, does not have a history of bushfire ignitions or known areas of high bushfire behaviour potential. The HAMZ does not require intensive management and focuses on those actions appropriate to conserve biodiversity and cultural heritage.

4.1.5 Water Management

The management of water resources adjacent and upstream of the reserve has the potential to both positively and negatively affect the values of the reserve. Decreasing river levels and associated flooding regimes can change the riverine landscape. Billabongs that remain dry can be colonised by vegetation, low river levels often lead to dieback of riparian vegetation which in turn may greatly affect many fauna species. Lower than normal river levels can also accelerate erosion on exposed river banks and contribute to higher levels of salinity.

At present, many of the secondary creeks and ephemeral billabongs are dry and have been for some years. River red gum dieback, while not evident within the reserve is certainly occurring on adjoining properties and may occur within the reserve in the future. Water for environmental flows can in theory be accessed via a variety of mechanisms and different water entitlements such as “The Living Murray” initiative, through State Government allocations held by the Murray Wetlands Working Group or more desirably by an existing DECC allocation, which could be transferred. An audit of riverine health will be undertaken within the reserve to quantify the effect that low river levels are having on the vegetation communities within the reserve.

The NPWS will liaise with key government departments, working groups, funding entities and other stakeholders to ensure that changes in water regime management do not negatively affect the natural and cultural values of the reserve.

4.2 CULTURAL HERITAGE

Cultural heritage includes both indigenous and non-indigenous history. It comprises important components of the environment that may have aesthetic, historic, scientific and social significance to present and future generations.

4.2.1 Aboriginal Heritage

Archaeological sites are important to Aboriginal communities, as they are a testament to their culture’s great antiquity. Aboriginal people may also have traditional spiritual links with an area and hold knowledge, which is important for nature conservation.

While the NPWS presently has legal responsibility for the protection of Aboriginal sites, it acknowledges the right of Aboriginal people to make decisions about their own heritage. It is therefore policy that Aboriginal communities be consulted about decisions regarding the management of Aboriginal sites and related issues and how the Aboriginal culture and history of an area controlled by the Service will be promoted and presented.

Kemendok Nature Reserve derives its name from the name given to a dialect of the Keramin language, known as ‘Kemendok’ (Hercus, 1989). The language dialect ‘Kemendok’ is thought to have been spoken by the Kureinji Aboriginal people of the area prior to European settlement.

The Kureinji Aboriginal tribe are thought to be the original inhabitants of Kemendok Nature Reserve and surrounding areas. The Kureinji people are thought to have inhabited an area from near Euston on the northern bank of the Murray River downstream to Wentworth (Tindale 1940).

Kemendok Nature Reserve contains two recorded burial sites, both of which are reburials. The reserve also contains scarred trees. Many Aboriginal sites have been recorded adjacent to major rivers in the region providing evidence that these riverine areas supported a large population of Aboriginal people. Morey, an early European traveller to the area noted that “we had evidently got into thickly peopled country” between Lake Benanee and the Murray River in 1836. In his travels along the Murray, Sturt observed several groups of Aboriginals exceeding 100 people, including one group estimated at about 600 people (Craib 1992). The reserve is likely to contain other as yet unrecorded sites commonly found in riverine areas such as middens, scar trees and fireplaces.

Aboriginal people were involved in the pastoral operations of many stations in Western NSW during the late 1800’s and early 1900’s. Aboriginal workers were employed by Tapalin Station, which encompassed the area that is now Kemendok Nature Reserve.

4.2.2 Historic Heritage

(Much of the information below has been provided by Jim Maynard, the owner of Kerribee Station.)

Kemendok Nature Reserve was originally part of Tapalin Station, a squatter’s lease which incorporated most of Mallee Cliffs National Park and stretched as far north as Prungle Station. John and Mary Grace are thought to be the original leaseholders. The property passed through various families and was purchased in 1965 by Jim Maynard who sold the land, which became Kemendok Nature Reserve to the NSW NPWS in 1987.

The homestead for the Tapalin property, which was known locally as Bengallo was situated at the old shed site on the banks of the Murray River (refer map). The homestead was relocated after the 1917 floods.

A number of interesting and locally significant historic sites are located within the reserve. Immediately downstream from the old homestead site are some old yards used to house pigs, which are thought to be approximately 100 years old. Adjacent to the homestead site are a further set of yards and a race made from red gum timber which were constructed between 1940 and 1950 and used during sheep mustering operations (refer map).

Evidence still exists of the original rabbit proof boundary fence that is thought to have been erected in the 1880’s to protect valuable grazing country from the rabbit plagues which occurred during that time. It is possible that the foresight shown during this time played a crucial role in protecting a now significant stand of old man saltbush within the reserve as stands of old man saltbush are no longer evident in surrounding areas.

A roller made from river red gum is still located within the reserve. The roller was made by Jim Maynard and is perhaps 40 years old. It was used to break up clods of clay after the ploughing of paddocks.

4.3 USE OF THE RESERVE

4.3.1 Public Access

The primary purpose of nature reserves is conservation of wildlife and natural environments. Research, educational use, nature study and some other use may be appropriate provided they do not conflict with conservation. Kemendok Nature Reserve has very high conservation values due to the important vegetation communities present and the habitat it provides for the endangered regent parrot. It is likely that the reserve contains important cultural heritage, such as Aboriginal occupation sites. The reserve also contains examples of structures associated with early European grazing in the area.

In order to avoid disturbance of significant plant and animal communities, and to reduce the risk of weed invasion and fire, opportunities for the public to visit the reserve will be limited to organised events, such as Discovery programs and neighbour field days, or to special groups subject to permission from the local NPWS office.

Other conservation areas in the region cater for tourism and recreation. These areas include Mungo, Yanga and Kinchega National Parks in NSW, and Hattah-Kulkyne, Murray-Sunset and Wyperfield National Parks and Murray Kulkyne Regional Park in Victoria.

4.3.2 Research

The purpose of scientific study in the reserve is to improve understanding of natural and cultural resources and the processes, which affect them. Research can establish the requirements for management of particular communities, species and cultural features.

NPWS research efforts must be directed towards the areas of greatest need. Extensive research has been undertaken in relation to regent parrot populations within the reserve and surrounding areas. It is anticipated that this research will continue and be expanded upon with direction provided by the Regent Parrot Priority Action Statement.

Research by other organisations, students and interested members of the community may also provide valuable information for management. In 1997 the University of Ballarat conducted general fauna survey work within the reserve. The Service supports these types of research projects and assistance will be provided where feasible.

4.3.3 Management Operations

Management facilities in the reserve are limited to fences (both internal and external), vehicle tracks, and information signage. The vehicular track system is based on the

pattern of roads constructed by the former owners. Some of these tracks are not needed for reserve management and will be closed to promote regeneration and habitat improvement. Tracks proposed to be maintained for management purposes are shown on the map.

Reserve fencing will be maintained where possible. It should be noted that the reserve boundary is not fully fenced due to the number of steep sided creeks that run through the reserve and are subject to inundation and extensive damage during years of high river levels. In 1996 another fenceline outside the reserve boundary was established (with consent from Forests NSW) in order to better facilitate management and assist in exclusion of stock into the reserve. This fenceline avoids the majority of creeks and therefore is far more effective in excluding the movement of stock into the reserve. The NPWS is responsible for maintenance of this secondary fenceline.

An internal fence is located within the reserve, which acts as an enclosure for the important old man saltbush community in the reserve (refer map). The internal fence will be upgraded to ensure that stock cannot enter this area.

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6. MANAGEMENT ISSUES AND STRATEGIES

Current Situation	Desired Outcomes	Strategies	Priority
<p>Native and introduced plants</p> <p>The reserve contains significant vegetation communities.</p>	<p>Natural ecological processes are maintained.</p>	<p>The old man saltbush community exclusion fence will be upgraded.</p>	High
<p>Four noxious weeds are recorded from the reserve.</p>	<p>Control weed species to minimise negative impacts on native species and ecological processes.</p>	<p>A weed control plan will be prepared providing for monitoring and treatment of noxious weeds.</p>	High
		<p>Map distribution and density of noxious weed species.</p>	Medium
		<p>Contractors and NPWS staff using heavy plant will be required to thoroughly clean machinery prior to entering the reserve.</p>	High
<p>Native and introduced animals</p> <p>Little research has been undertaken in regard to the flora and fauna composition in the reserve.</p>	<p>Expand knowledge of species within the reserve.</p>	<p>Conduct fauna and flora surveys to expand the knowledge of species within the reserve and to establish baseline data that management actions can be measured against.</p>	High
<p>The reserve supports significant breeding populations of the endangered regent parrot.</p>	<p>Breeding populations within the reserve are monitored.</p>	<p>Monitoring of known nest colonies within the reserve will be conducted annually.</p>	High

<p>The status of the Koala within the reserve is unclear.</p>	<p>The status of the koala population is clarified.</p>	<p>Koala surveys will be undertaken within and adjacent to the reserve.</p>	<p>High</p>
<p>The reserve contains rabbits, foxes, cats and feral pigs. All species have the potential to negatively affect reserve values.</p>	<p>Control introduced species to minimise impacts on native species and ecological processes.</p>	<p>Control introduced species with priority to rabbits.</p>	<p>High</p>
<p>Domestic stock occasionally enter the reserve and may potentially damage reserve values.</p>	<p>Control and if possible eliminate negative impacts of domestic stock on reserve values.</p>	<p>Monitor introduced animal populations and instigate control measures as appropriate.</p>	<p>Medium</p>
<p>Domestic stock occasionally enter the reserve and may potentially damage reserve values.</p>	<p>Control and if possible eliminate negative impacts of domestic stock on reserve values.</p>	<p>Regularly patrol reserve to ensure stray stock are removed as soon as possible.</p>	<p>High</p>
<p>Fire management</p>	<p>Control and if possible eliminate negative impacts of domestic stock on reserve values.</p>	<p>Liaise regularly with neighbours regarding boundary fencing and strategies to exclude stock where boundary fencing is problematic.</p>	<p>Medium</p>
<p>The reserve is considered to have a low - medium bushfire risk.</p>	<p>Fire is excluded from the reserve.</p>	<p>A fire management strategy and operational guidelines will be prepared for the reserve.</p>	<p>Medium</p>
<p>Low and discontinuous fuel loads inhibit the likelihood of large-scale fire.</p>	<p>Life, property and natural and cultural values within the reserve are protected.</p>	<p>Suppress all unplanned fires and where possible exclude fire from the reserve.</p>	<p>High</p>
<p>Most fires are likely to start through escaped campfires from people camping illegally within the reserve.</p>	<p>Endangered species are protected from the effects of wildfire.</p>	<p>Records of fire occurrence will be maintained with emphasis on mapping and recording of the area, frequency, seasonality and intensity of fire.</p>	<p>Medium</p>
<p></p>	<p></p>	<p>Maintain cooperative arrangements with Rural Fire Service and reserve neighbours to ensure coordination in fire management in the reserve and adjoining lands.</p>	<p>Medium</p>

<p>Water management</p> <p>At present many of the secondary creeks and billabongs are dry and have been for some time. This may lead to a degradation of natural values over time.</p>	<p>Maintenance of a natural flow and flooding regime within reserve water courses.</p>	<p>Continue to work with key government departments, working groups and other stakeholders to ensure changes in water regimes do not negatively affect the natural and cultural resources of the reserve.</p> <p>NPWS will seek to establish communication and cooperative strategies with key government departments in order to facilitate effective water management within the reserve.</p> <p>NPWS will conduct an audit of tree health along creek lines within the reserve to assist in guiding future water management requirements.</p>	<p>Medium</p> <p>Medium</p> <p>High</p>
<p>Cultural heritage</p> <p>There is limited knowledge about the Aboriginal cultural significance of the reserve.</p> <p>Cultural sites within the reserve are not formally recorded.</p>	<p>Understanding of cultural significance of the reserve is improved.</p> <p>All cultural sites are recorded and protected.</p> <p>Aboriginal people are actively involved in the management of their heritage</p>	<p>The old homestead site, yards, race and red gum roller will be formally recorded and conservation statements developed for those items requiring conservation.</p> <p>Consult with the Aboriginal community regarding the significance of the reserve and the management of Aboriginal heritage within the reserve.</p>	<p>Medium</p> <p>High</p>

<p>Public Access</p> <p>There are no visitor facilities within the reserve and none are considered necessary.</p> <p>Campers are known to use the reserve illegally.</p>	<p>Use of the reserve is appropriate, organised through NPWS and does not compromise reserve values.</p>	<p>Signs will be erected at reserve entrances to inform the public of land tenure and discourage visitors from entering the reserve without prior approval of NPWS.</p> <p>A limited number of organised public visits to the reserve may be arranged.</p>	<p>Medium</p> <p>Low</p>
<p>Research</p> <p>Research will improve the understanding of the reserve's natural and cultural assets, the processes that affect them and assist in guiding management decisions.</p>	<p>Research enhances the management decision making process and has minimal environmental impact.</p>	<p>The NPWS will carry out and encourage research relevant to the management of the reserve. Priority will be given to plant and animal surveys, particularly for threatened species, detailed vegetation mapping, Aboriginal site surveys, fire ecology research and European historic heritage.</p> <p>Research markers and structures must be removed on completion of the research.</p>	<p>Medium</p> <p>Medium</p>
<p>Management operations</p> <p>Management trails in the reserve are in poor condition.</p> <p>Some sections of fencing (internal and external) are in poor condition.</p>	<p>Management trails and fences are maintained to an adequate standard.</p>	<p>Management trails are maintained.</p> <p>Tracks and trails not required for management purposes are closed and allowed to regenerate.</p> <p>The internal old man saltbush enclosure fence will be upgraded to stock proof</p>	<p>Medium</p> <p>Medium</p> <p>Low</p>

		standard. The external fence on Mallee Cliffs State Forest will continue to be maintained.	High High
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