LAKE URANA NATURE RESERVE

PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

June 2001

This plan of management was adopted by the Minister for the Environment on 5th June 2001

Cover photograph: One of the rabbit observation towers left on the reserve from when the area was used as a CSIRO research station.

NSW National Parks and Wildlife Service

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1. INTRODUCTION

The *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 the area will be managed in the years ahead.

The procedures for the adoption of a plan of management for a nature reserve are specified in the Act:

* The Director-General is required to refer the plan to the National Parks and Wildlife Advisory Council for its consideration and advice.

* The Director-General is required to submit the plan to the Minister, together with any comments or suggestions of the Advisory Council.

* The Minister may adopt the plan without alteration or with such alterations as the Minister may think fit, or may refer it back to the Director-General and Council for further consideration.

The Act specifies that once a plan has been adopted by the Minister it will be implemented, and that no operations may be undertaken within the nature reserve except in accordance with the plan. If after adequate investigation, operations not included in the plan are found to be justified, the plan may be amended in accordance with 76(6) of the Act.

For additional information or enquiries on any aspect of the nature reserve or on this plan, contact the Service's Griffith Office at 200 Yambil Street Griffith or by phone on (02) 6966 8100.

Although not a requirement under the Act, a draft plan of management for Lake Urana Nature Reserve was placed on public exhibition from May to August 2000. All comments received were considered by the Advisory Council and by the Minister before adopting this plan.

This plan of management establishes the scheme of operations for Lake Urana Nature Reserve. In accordance with Section 76 of the *National Parks and Wildlife Act 1974*, this plan of management was adopted by Bob Debus, Minister for the Environment on 5th June 2001.

2. NATURE RESERVES IN NEW SOUTH WALES

2.1 PURPOSES

Under the National Parks and Wildlife Act, nature reserves are areas of special scientific interest containing wildlife or natural environments or natural phenomena. They are valuable refuge areas, where natural environments, processes and wildlife can be conserved and studied.

The purposes of nature reserves are defined in the Act as:

"(a) the care, propagation, preservation and conservation of wildlife;

(b) the care, preservation and conservation of natural environments and natural phenomena;

(c) the study of wildlife, natural environments and natural phenomena; and

(d) the promotion of the appreciation and enjoyment of wildlife, natural environments and natural phenomena."

2.2 MANAGEMENT OBJECTIVES

In accordance with the Act, the following objectives relate to the management of nature reserves in New South Wales:

- protection and preservation of scenic and natural features, including significant geological and geomorphological features;
- conservation of wildlife, including maintenance of biodiversity and populations of threatened species;
- maintenance of natural processes;
- preservation of catchment values;
- preservation of Aboriginal sites in consultation with the Aboriginal community;
- conservation of non-Aboriginal historic features;
- provision of opportunities for appropriate use; and
- encouragement of scientific and educational enquiry into environmental features and processes.

2.3 MANAGEMENT POLICIES

In order to achieve the above purposes and objectives, management of nature reserves is undertaken in accordance with the following broad policies.

Nature conservation

- All geological, geomorphological and landscape features will be protected.
- All works will be undertaken in a manner which minimises erosion and water pollution.

- Where erosion has been accelerated by human activity or is threatening significant values, appropriate control measures will be undertaken.

- The Service supports the principles of Total Catchment Management and will liaise with local government and other authorities to maintain and improve the water quality of reserve catchments.

- Native vegetation will be managed to:
  - maintain floristic and structural diversity;
  - conserve significant communities and species;
  - encourage regeneration of areas previously cleared or disturbed; and
  - maximise habitat values for native animal species.

- Habitat diversity and quality, and populations of native animals, will be conserved through maintenance of natural processes, minimisation of human impacts and specific conservation programs where necessary.

- Priority will be given to specific management programs that favour conservation of threatened species. Measures included in recovery plans for threatened species will be implemented.

Cultural heritage

- Local Aboriginal Land Councils and other relevant Aboriginal community organisations will be consulted and actively involved in all aspects of management of Aboriginal sites and values.

- Aboriginal people will be permitted to carry out activities related to maintenance of Aboriginal culture. Any such activities must comply with the objectives and policies of this plan of management and have minimal environmental impact.

- Aboriginal sites will be protected from disturbance or damage by human activities, in conjunction with relevant Aboriginal organisations. All works with the potential to impact on Aboriginal sites will be preceded by an archaeological assessment.

- The location of Aboriginal sites will not be publicised except where:
  - the agreement of the relevant local Aboriginal land council and other Aboriginal community members has been obtained;
  - a conservation study has been prepared and any management works necessary to protect the site from damage have been implemented; and
  - the site will be interpreted to promote public knowledge and appreciation of Aboriginal culture.

- Historic structures and places will be managed in accordance with the provisions of the Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (the Burra Charter). Historic features which are deemed to be of high historic significance will be conserved.

Introduced species

- Introduced plant species will be controlled and if possible eradicated. Priority for treatment will be given to those which:
  - have been declared noxious;
  - threaten the integrity of native communities;
  - may affect neighbouring lands;
  - have a high capacity for dispersal; and/or
  - are new isolated occurrences.

- Introduced animals will be controlled where they have an impact on native species. Programs will be designed to avoid impact on non-target species.

- The cooperation of other authorities and neighbours will be sought in implementing weed and pest animal control programs.

- The Service will assist with boundary fencing maintenance as part of fencing agreements with neighbours, subject to funding and priorities.

Fire management

- Fire will be managed to ensure:
  - protection of human life and property;
  - maintenance of plant and animal communities through the provision of fire regimes compatible with their conservation;
  - conservation of rare, threatened and biogeographically significant plant and animal species and communities; and
  - protection of Aboriginal sites, historic places and management structures.

- Prescribed fire may be used to achieve a variety of fire regimes in appropriate vegetation types, maintain habitat suitable for species with specific requirements and protect significant natural and cultural features.

- Manipulation of ecosystems by prescribed fire to achieve specific objectives should be based on scientific research and understanding of the ecological effects of treatment.

- As far as possible, the spatial extent of all wildfires will be restricted, and fire will be excluded from sensitive vegetation communities and cultural heritage sites.

- Fire trails will be maintained to a satisfactory standard of access, safety and stability.

- The Service will actively participate in district Bush Fire Management Committees. Close contact, coordination and cooperation will be maintained with Rural Fire Service brigades, Council fire control officers and neighbours with regard to fuel management and fire suppression.

Research and public use

- The Service will undertake and encourage research that will improve knowledge and management of the reserve. Research structures and long term markers must be placed in locations that will minimise their visual impact and be removed upon completion of the research.

- Nature study visits by educational and community organisations and individuals will be permitted where this will not conflict with conservation of natural and cultural heritage.

- Community appreciation of the area and awareness of management programs will be promoted through means such as media releases, provision of educational material and direct contact with neighbours and community organisations.

3. LAKE URANA NATURE RESERVE

3.1 LOCATION AND GAZETTAL

Lake Urana Nature Reserve is located in the Riverina, about 37 km east of Jerilderie and 10 km west of Urana. It lies on the shore of Lake Urana, an intermittent lake filled by flood flows. The reserve has an area of 302 ha and was dedicated in 1996.

The reserve lies in Urana Shire. The surrounding district is used for grazing and cereal cropping and has been extensively cleared. Lake Urana Nature Reserve is one of several small nature reserves in the Riverina which sample remnants of formerly widespread vegetation types.

3.2 NATURAL AND CULTURAL HERITAGE

Bioregional context

Lake Urana Nature Reserve is located on the eastern edge of the Riverina Bioregion, which covers part of the Riverina district. This bioregion has largely been cleared of native vegetation and remnants are generally very small. Less than 1% of the bioregion is represented in conservation reserves and Lake Urana is therefore an important component of the system.

Landform, Geology and Soils

The nature reserve is located on the western shore of Lake Urana, a large shallow intermittent lake in a depression in the Riverine Plain. The lake is at the end of the drainage basin of Billabong, Coonong and Urangeline Creeks. It fills every 10-20 years and retains water for several years. The outer edges, however, (including the section in the nature reserve) are flooded only for short periods. The reserve falls steeply to the lake bed on its eastern side but the rest of the reserve is gently sloping in a westerly direction.

Most of the reserve and surrounding area is composed of Tertiary sediments of silcrete, sandstones and mudstones. Recent alluvial deposits are found on the lake bed. On its western side Lake Urana is contained along most of its length by soft sedimentary rocks, exposed along the lake shore, while on the eastern side is a lunette of recent sand. Within the nature reserve, however, an area of Ordovician metasediments outcrops on the lake shore. This consists of fine grained metamorphic rock such as slates and phyllites.

Soils are red earths and light red clays over most of the reserve and white and grey clays on the lake bed. Soils along the shore are sandy and those in the western part of the reserve are heavier.

Vegetation

Most of the nature reserve supports a woodland of yellow box *Eucalyptus melliodora* and white cypress pine *Callitris glaucophylla*. There are scattered berrigan *Pittosporum phylliraeoides*, buloke *Casuarina leuhmannii*, black cypress pine *Callitris endlicheri*, needlewood *Hakea tephrosperma* and cooba *Acacia salicina*. Yellow box is dominant on the higher sandy soils near the lake and less common in the western part of the reserve, where buloke and needlewood are the main trees. Heavier soils in the northwestern corner have a low woodland of boree *Acacia pendula* and buloke.

The area of yellow box in the reserve is one of only two relatively large areas remaining in the Riverina and the only large sample in a conservation reserve.

Yellow box was once extremely widespread through eastern NSW on the good soils and flat terrain of the tablelands and western slopes but these lands have been almost completely cleared. Buloke and boree are also poorly conserved in the State's reserve system.

Shrubs in the reserve include thorny saltbush *Rhagodia spinescens*, ruby saltbush *Enchylaena tomentosa*, western golden wattle *Acacia decora*, emu bush *Eremophila longifolia* and black cottonbush *Maireana decalvans*. The ground cover consists of a diverse collection of grasses and herbs, with over 70 species recorded including wiregrass *Aristida* spp., *Danthonia* spp., speargrass *Stipa* spp., sunray *Helipterum* spp. and several lilies such as the nodding chocolate-lily *Dichopogon fimbriatus*.

The reserve has not been grazed by stock for most of the last 40 years, although it has been grazed by rabbits. This makes it rare in the Riverina and may be the reason for the high diversity of ground cover plants.

On the lake shore is a narrow woodland of river red gum *Eucalyptus camaldulensis* consisting of some large trees and younger regrowth. Following floods, a number of grasses and short lived herbs such as weeping love grass *Eragrostis parviflora*, sneezeweed *Centipeda* sp., sedge *Cyperus* sp. and yellow buttons *Helichrysum apiculatum* establish on the lake bed.

The reserve has a small population of the endangered winged peppercress *Lepidium monoplocoides* (listed on Schedule 1 of the *Threatened Species Conservation Act* 1995). Several plants of the regionally rare northern sandalwood *Santalum lanceolatum* occur in the boree area and near the peppercress patch. These have been observed only in the last few years and it is possible that numbers of this species in the reserve will increase.

Native Animals

The reserve is an important area of remnant habitat for native animals of the western slopes and plains, particularly for birds, both as habitat for sedentary species and as a stopover during movements between other natural areas. A number of woodland birds of the wheat/sheep belt are declining and remaining areas of native vegetation are vital for their conservation.

Only limited survey for native animals has been undertaken. Species recorded are the eastern grey kangaroo *Macropus giganteus* and 37 species of birds. Commonly observed bird species include the red-rumped parrot *Psephotus haematonotus*, brown treecreeper *Climacteris picumnus*, striated pardalote *Pardalotus striatus*, spiny-cheeked honeyeater *Acanthagenys rufogularis* and striped honeyeater *Plectorhyncha lanceolata*. The regionally uncommon grey-crowned babbler *Pomatostomus temporalis* has been recorded in the reserve.

When the lake is flooded, waterbirds such as wood ducks *Chenonetta jubata*, Pacific black duck *Anas superciliosa*, Australian grey teal *Anas gracilis*, yellow-billed spoonbill *Platalea flavipes*, black-fronted dotterel *Charadrius melanops* and magpie-lark *Grallina cyanoleuca* occur in moderate numbers.

The common brushtail possum *Trichosurus vulpecula* and water rat *Hydromys chrysogaster* have been observed in other sites at Lake Urana and may occur in the reserve.

Aboriginal History

Lake Urana would have been a rich source of food for Aboriginal people and is likely to have supported relatively high populations during previous wetter climatic periods.

Burials, grinding dishes and ovens have been found in the lunette on the eastern side of the lake. The skeletal remains have been dated at between 25,000 and 30,000 years before present (Page, 1994). The lake lies along a line between significant concentrations of art sites in the Riverina and Victoria. It has been suggested that it may have mythological significance and be connected to other features in the region by dreaming lines. It may also have been part of an important movement corridor following Billabong Creek (Meredith pers. comm.).

A shell midden and artefact scatters have been reported on the lake shore within the reserve but these have not been confirmed. There are also two possible scarred trees. The fine grained metamorphic rock that outcrops in the reserve may have been an important source of material for stone tools.

The nature reserve lies within the area of the Wiradjuri Aboriginal people and the administrative boundary of the Narrandera Local Aboriginal Land Council.

Non-Aboriginal History

Lake Urana Nature Reserve was formerly a sheep grazing property. In 1951 the CSIRO began research on the property into the effects of rabbit myxomatosis and in 1966 bought the property. Research continued until 1985. In 1992 the Service bought the land from CSIRO to establish Lake Urana Nature Reserve.

The Nature Reserve has historical interest as one of the early field release sites of the myxomatosis virus that resulted in spectacular rabbit mortality rates (Myers et al. 1954). A hut used by CSIRO researchers was formerly located in the south-eastern corner of the reserve. The hut was acquired from the Snowy Mountains Authority and relocated to Lake Urana in 1966. The hut was weatherboard with 6 rooms and separate out-buildings for shower and toilet. The hut was in a poor state of repair and was dismantled and removed upon transfer of the property to NPWS. Two small observation towers were erected for rabbit research about the same time as the hut. These still stand in the reserve.

There were formerly two rabbit-proof fences around the boundary, 6m apart. A rabbit-proof fence was also located north-south across the centre of the reserve, dividing it into two areas subject to different rabbit control regimes. This may have resulted in differences in vegetation on the two sides of the reserve.

References

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4. MANAGEMENT ISSUES AND STRATEGIES

Current Situation	Strategies	Priority
Soil conservation Because of the gentle slopes the reserve is mainly free of erosion. An erosion gully has formed in the southeastern corner, however, by runoff from neighbouring land. At present, control action is not warranted but the gully should be monitored.	The erosion gully in the southeastern corner of the reserve will be monitored and action will be taken if needed to arrest the erosion.	Low
Vegetation regeneration The area may have been logged or cleared in the past since there are only a few large cypress pine trees and no very large yellow box. Many of the yellow box trees have multiple trunks, indicating that they have been cut or ringbarked, or possibly affected by a large fire 80-120 years ago. The reserve's habitat value for aboreal mammals and birds requiring tree hollows is limited because of the lack of old trees and therefore hollows. It is reported that in 1951 the property was heavily overgrazed, badly rabbit infested and in very poor condition and that by the late 1960s the vegetation was still very open with few pines (Chris Davey, pers. comm.). Since then there has been good regeneration of needlewood and cypress pine in parts of the reserve where rabbit warrens were relatively sparse. The pine re-growth is thought to date from good rainfall in 1973-74.	Regeneration of native vegetation will be encouraged by such means as control of grazing pressure and application of appropriate fire regimes.	High
Shrub diversity, especially of acacias, is low, possibly a result of lack of fire combined with former stock grazing and rabbit grazing. Numbers of kangaroos in the reserve are quite high and it is probable that they are affecting regeneration.	Exclosures will be constructed in the reserve to check for improved regeneration and the presence of new species in the absence of grazing by kangaroos and rabbits.	Medium
The reserve is isolated from other substantial areas of native vegetation. Long term conservation of its plant and animal species (and of the wildlife of the district in general) depends upon retention of remnant vegetation on neighbouring properties and re-establishment where needed of links between the remnants.	Links with other natural areas are very important for maintaining the biodiversity of the reserve. The Service will encourage local landholders and Landcare groups to revegetate areas associated with the reserve and create wildlife corridors linking the reserve with other areas of native vegetation.	Medium

Significant plant species		
The endangered winged peppercress occurs in a small depression running from an old dam on adjacent private property. It appears that the peppercress requires good moisture during its growth period. The area has been fenced to exclude rabbits. A Recovery Plan for the winged peppercress is to be prepared in the near future.	The cooperation of the reserve's northern neighbour will be sought to ensure that there is no change in drainage to the depression containing the winged peppercress. Any additional fencing work adjacent to the area of winged peppercress will be undertaken in a manner which minimises ground and vegetation disturbance.	Low
Comprehensive plant survey has not been undertaken, particularly for ephemeral species, and it is possible that other significant species occur. The threatened plant *Caladenia arenaria* has been found a few kilometres from the reserve and may occur within it. Slender Darling pea *Swainsona murrayana* could also be present in the reserve.	Survey will be undertaken for rare and threatened plant species.	Medium
It has been suggested (Farer c.1990) that old man saltbush *Atriplex nummularia* be reintroduced to the boree area of the reserve. This species was once widespread on the Riverine Plain but has largely disappeared because of grazing.	The desirability of re-introducing old man saltbush will be investigated. This species will only be reintroduced if it is established that it once comprised a significant part of the reserve's ecology.	Low
Introduced species		
African boxthorn *Lycium ferocissimum,* horehound *Marrubium vulgare,* Patersons curse *Echium plantagineum* and purple-flowered devils claw *Proboscidea louisianica* occur in the reserve and are subject to on-going control programs. Introduced grasses and pasture weeds are also common in the reserve but their control is not practical.	Monitoring will be undertaken for noxious and significant environmental weeds. Any outbreaks will be treated. Weed control programs will avoid impacts on the winged peppercress, sandalwood and any other significant species found in the reserve.	High
Rabbits were uncontrolled on the reserve for many years except as part of CSIRO research and were in high numbers for much of the time. Upon completion of the research the Urana Rural Lands Protection Board undertook an extensive program of rabbit control and the Service has undertaken follow-up control. Rabbit numbers are currently low.	The distribution of horehound will be determined. It will be treated and if possible eliminated. On-going monitoring and control of rabbits will be undertaken as needed.	High High
Foxes occur in small numbers. Control programs for foxes are practical only if undertaken over a large area.	Fox control will be undertaken if part of a cooperative program with neighbours.	Medium

Fire management Fire is a natural feature of the environment of the nature reserve and is essential to the survival of some plant communities. Frequent or regular fire, however, can cause loss of particular plant and animal species and communities. Fire could also damage scarred trees, historic features and fences and threaten neighbouring land. Post contact fire history is also unknown but it appears that the reserve has not been burnt for at least 50 years and possibly not for 100 years. Little is known about the ecological fire needs of the reserve. Cypress pine is fire sensitive but many of the other species require fire for regeneration. Fire may be needed for regeneration of shrubs, particularly acacias, in the reserve but there is considerable risk in burning as new shoots and seedlings may be heavily grazed by kangaroos. The reserve is bounded by largely cleared private property and has minimal public use. The fire risk is considered to be low.	Prescribed fire may be used to reduce the risk of wildfire or to encourage regeneration of particular native plant species. Prior to any such burning an assessment of vegetation characteristics and the status of key species in the area will be undertaken to determine the need for fire and its likely ecological effect. The use of heavy machinery for fire suppression will avoid known locations of rare plants and Aboriginal sites. Research will be encouraged into the ecological effects of fire in the reserve, particularly the fire response of rare and threatened plant species. The Service will continue to actively participate in the Lockhart-Urana Bush Fire Management Committee. Close contact and cooperation will be maintained with Council fire officers and volunteer rural fire brigades. Fire management guidelines will be prepared for the reserve and included in the Region Incident Procedures. The guidelines will detail life, property and natural and cultural resource protection principles, strategies and programs and cooperative arrangements.	Low Low High Medium
Aboriginal heritage While Aboriginal sites have been reported in the reserve they have not been confirmed or formally recorded. Archaeological survey is needed to check these and identify any other sites. It will be important to avoid disturbance of sandy areas along the lake shore as these may contain camp sites and possibly burials.	Survey and recording will be undertaken for Aboriginal sites. The Narrandera Local Aboriginal Land Council and other relevant Aboriginal community organisations will be consulted and actively involved in all aspects of management of Aboriginal sites and values in the reserve.	Low

Historic heritage The only remaining historic features in the reserve are two observation towers used for CSIRO rabbit research	The observation towers will be recorded but not maintained. When they collapse they will be removed.	Medium
Public use As one of only a few areas of publicly owned remnant vegetation in the district, the reserve has the potential to be of interest for school and community educational visits. It is, however, a small and significant area of remnant vegetation and use must be carefully managed. The reserve has no recreational attractions except in the occasional years when the lake is full. It would not be appropriate to provide facilities for public use during these times because of the reserve's conservation significance, small size and vulnerability to damage. Public access is available to the northwestern corner of the reserve via a legal right of way (Dunraven Lane) that heads north from the Urana-Jerilderie Road.	Nature study visits by educational and community organisations and individuals will be permitted. Public vehicle use will be permitted on the vehicle track, with access on foot to other areas. Group sizes and frequency of use will be limited if necessary to minimise environmental impacts such as trampling of regenerating native vegetation. No visitor facilities will be provided. If there is sufficient demand, educational material may be prepared to promote public awareness of the reserve's values and management.	Low
Research Scientific study is necessary to improve understanding of the reserve's natural and cultural heritage, the processes which affect them and the requirements for management of particular species. Some specific topics for Service research have been mentioned above. Resources are limited, however, and research by other organisations and students should be encouraged.	Priority research areas are: - native plant and animal survey, especially for rare and threatened species; - monitoring of vegetation changes over time or in response to management practices; - management requirements of the threatened winged peppercress and other significant plant species found in the reserve; - the fire management needs of the reserve's vegetation; and survey for Aboriginal sites.	Medium

Management operations		
Management facilities consist of fences and a loop vehicle track. These are in good condition.	The management track will be maintained. As far as is practical all management activities away from this track will be undertaken by foot or using quad bikes to avoid damage to regenerating vegetation.	Medium
The eastern fenceline is located a significant distance from the actual reserve boundary. Relocation is needed to keep stock out of the eastern section of the reserve and allow regeneration of native vegetation.	The eastern fenceline will be relocated to, or closer to, the reserve boundary. Before relocation, vegetation and Aboriginal site survey will be undertaken to determine the environmental impact of relocation and the least damaging location for the fence.	High