

Information Sheet on Ramsar Wetlands

1. Date this sheet was completed/updated:

April 1999

FOR OFFICE USE ONLY.

DD	MM	YY

Designation date

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Site Reference Number

2. Country:

Australia

3. Name of wetland: Narran Lake Nature Reserve

4. Geographical co-ordinates: Latitude: 29° 43' S; Longitude: 147° 26' E

5. Altitude: 120 - 140m ASL

6. Area: 5,531 hectares

7. Overview: Narran Lake Nature Reserve covers part of a large terminal wetland of the Narran River in New South Wales (NSW) at the end of the Condamine River system which flows from Queensland. The area is internationally significant for waterbird breeding and as habitat for species including a number listed under the Japan–Australia and China-Australia Migratory Bird Agreements (JAMBA and CAMBA). The Nature Reserve also contains a variety of flora associations which are considered to be threatened in NSW.

8. Wetland Type

marine-coastal:	A	B	C	D	E	F	G	H	I	J	K
inland:	L	M	N	O	P	Q	R	Sp	Ss	Tp	Ts
	U	Va	Vt	W	Xf	Xp	Y	Zg	Zk		
man-made:	1	2	3	4	5	6	7	8	9		

Please now rank these wetland types by listing them from the most to the least dominant:

Inland Wetlands N P Ts W Xf

9. Ramsar Criteria:

1a 1b 1c 1d | 2a 2b 2c 2d | 3a 3b 3c | 4a 4b

Please specify the most significant criterion applicable to the site: : 2c

10. Map of site included? Please tick *yes* -or- *no*

11. Name and address of the compiler of this form:

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12. Justification of the criteria selected under point 9, on previous page.

Criteria 1(a) Narran Lake Nature Reserve is a particularly good representative example of a natural or near-natural wetland characteristic of the Darling Riverine Plains biogeographical region

Narran Lakes contain a considerable diversity of habitats including some of the largest expanses of Lignum (*Muehlenbeckia florulenta*) in NSW which are wetlands are geomorphologically significant as an excellent example of a relatively undisturbed terminal lake system in NSW.

Criteria 2(c) Narran Lake Nature Reserve is of special value as habitat of plants or animals at a critical stage of their biological life cycle

Waterfowl which have been recorded breeding in Narran Lake Nature Reserve and which are considered to have a restricted breeding distribution in Western NSW (Smith *et al*, 1995) include:

Australian Pelican	<i>Pelecanus conspicillatus</i>
Great Cormorant	<i>Phalacrocorax carbo</i>
Pied Cormorant	<i>Phalacrocorax varius</i>
Darter	<i>Anhinga melanogaster</i>
Rufous Night Heron	<i>Nycticorax caledonicus</i>
* Large Egret	<i>Ardea alba</i>
Little Egret	<i>Ardea gazetta</i>
Intermediate Egret	<i>Ardea intermedia</i>
* Glossy Ibis	<i>Plegadis falcinellus</i>
* Australian White (Sacred) Ibis	<i>Threskiornis molucca</i>
* Straw-necked Ibis	<i>Threskiornis spinicollis</i>
Great Crested Grebe	<i>Podiceps cristatus</i>
* Royal Spoonbill	<i>Platalea regia</i>
Gull-billed Tern	<i>Sterna nilotica</i>

* = Significant breeding populations

Narran Lakes are considered to be nationally and internationally significant as they are the major breeding site for the above species of waterbirds and many other species (see Appendix 1 for other species recorded breeding in Narran Lakes area). During the 1994-96 Murray-Darling Basin Water Monitoring Project run by Birds Australia, the Narran wetlands were among the highest ranked sites for species richness, number of breeding species and total number of birds.

Narran Lake Nature Reserve also supports a number of internationally important migratory bird species. These species are noted in Appendix 1 as those listed under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China-Australia Migratory Bird Agreement (CAMBA).

The Narran Lakes are listed on the Australian Register of National Estate (NPWS, 1995).

3(c) Narran Lake Nature Reserve regularly supports 1% of the individuals in a population of one species or subspecies of waterfowl.

The large numbers of Black-winged Stilts (*Himantopus himantopus*), Red-necked Avocets (*Recurvirostra novaehollandiae*), Marsh Sandpiper (*Tringa stagnatilis*), Straw-necked Ibis (*Threskiornis spinicollis*) and Red-kneed Dotterel (*Erythrogonys cinctus*) recorded in Narran Lake wetlands suggests that these wetlands may be of international importance for these species (Ley, 1998).

13. General location: The Narran Lake Nature Reserve is situated approximately 75 kms north west of Walgett and 50kms north east of Brewarrina in the north west of New South Wales, Australia.

14. Physical features: The geology of the Narran Lake Nature Reserve consists primarily of Quaternary sediments which include floodplain, outwash areas and drainage flats of black, red and white sandy to silty clay and clayey sand, and silt with areas of black and grey clayey silt and sand deposited in claypans and lakes. The remainder of the Nature Reserve to the north consists of sediments of the Rolling Downs Group of Quaternary talus material obscuring Cretaceous sediments (Offenberg, 1966). These sediments tend to be salty and highly alkaline (Martin, 1979; NPWS, 1995).

Cretaceous sandstone and quartzite sediments are exposed on the ridge country in the eastern part of the Nature Reserve. These ridges are capped in some places with Cainozoic silcrete. Soils on the ridges are generally red sandy loams, with gravelly soils in the highest areas. These soft red soils are prone to erosion and gullying. The Rolling Downs sediments are overlain by Quaternary sediments on the Narran River floodplain which consists of dark organic lake muds in the lakes and adjacent wetlands, and light grey clays in nearby playa lakes. The lunettes within the Nature Reserve consist of orange sand, while the younger dunes consist of yellow-white sands. Severe wind and water erosion in this area has resulted in extensive scalding and the production of claypans (NPWS, 1995).

The Narran Lake Nature Reserve is comprised of two land systems. These are the Narran Land System, which covers the majority of the Nature Reserve, and the Lightning Ridge Land System in the north and south east corner of the Reserve. The Narran Land System is characterised by an extensive lake bed with its associated discontinuous lunette and sandy levee, which has a relief to 5m as well as drainage depressions and isolated salina which are periodically inundated by the Narran River. The Lightning Ridge Land System consists of undulating ridges of Cretaceous claystone, siltstone and sandstone with slightly sloping sandy plateaux, narrow dendritic drainage lines and small rounded pans with a relief to 20m (Walker, 1991).

The Nature Reserve contains two open water areas (small lakes), Clear Lake and Back Lake, surrounded by extensive channelised wetlands vegetated with Lignum (*Muehlenbeckia florulenta*), River Cooba (*Acacia stenophylla*), and River Red Gum (*Eucalyptus camaldulensis*). The eastern half of the Reserve is low, gently undulating, sandy and rocky ridge country. A number of semi-saline playa lakes and drainage depressions, which fill from local rainfall, are located in this area east of Clear Lake. Between the wetland shore and the ridge country is an area of discontinuous aeolian lunettes and sandy levees. These were formed by deflation of the lake beds and accumulation of sand grains and salt by strong westerly winds (NPWS, 1995).

Flooding in the Narran Lakes is predominantly (85%) a Summer and Autumn event. However, floods have also been recorded in Narran Lakes in Winter and Spring (Smith, 1993). Annual inflows to the Narran wetlands are highly variable and more than one flood per year has occurred in 25% of the years for which flood data have been recorded. Back and Clear Lakes (within Narran Lake Nature Reserve) will usually retain water for approximately 4-6 months following inundation if no further inflows are received before they dry out. Narran Lakes is a terminal lake system and therefore outflows of the Lakes within the Nature Reserve occur only through drainage to Narran Lake, and by evaporation and seepage. Narran Lakes have an average inundation frequency of one in two years and, as such, provide more frequent waterbird habitat than other inland wetlands in NSW (Magrath, 1991).

The Narran River lies within the Murray-Darling Basin in NSW and is a distributary of the Balonne River in Queensland. The catchment of the Narran River extends to the Condamine River in the mountains of central-southern Queensland (Smith, 1993). The Balonne River is regulated by Beardmore Dam and flows reach the Narran River when high flows occur in the Balonne. Narran River is, however, at present unregulated and minimal water extraction takes place. There has been an embargo on additional extraction from the Narran River in NSW since 1984 (Magrath, 1991).

The climate of the Narran Lakes area is semi-arid with average annual rainfall varying between 358mm and 425mm. Monthly rainfall in this area is highly variable, with summer and winter peaks. The most reliable rainfall occurs in January, February and March. Unlike rainfall, temperatures are very consistent,

with a long hot summer followed by a short cold winter. There are great fluctuations in diurnal temperature, as well as large differences between summer and winter temperatures. Average maximum summer temperature is 36⁰C while the average winter minimum temperature is 5⁰C (Martin, 1979).

15. Hydrological values: The Narran River flows intermittently as a result of heavy rainfall in Queensland and annual flows are highly variable. The Narran Lakes system receives water at lower flows than the lake beds further north along the Narran River and hence floods more often and holds water for longer periods. In moderate flows, water fills Clear Lake and then flows back into Narran Lake. The water level of Clear Lake can drop very quickly if flows are not large enough to keep water levels up in both Narran and Clear Lakes (NPWS, 1995).

16. Ecological features: A number of vegetation communities exist within the Nature Reserve while the wetlands within the Nature Reserve contain a variety of associations. These include:

- Sedges and ephemeral herbs on the playa lakes and the main lake beds following receding flood waters
- Lignum (*Muehlenbeckia florulenta*) occurs in extensive areas and forms a dense shrubland around Clear and Back Lakes
- Common Reed (*Phragmites australis*) occurs in small patches amongst the Lignum
- The River Red Gum (*Eucalyptus camaldulensis*) - Coolibah (*Eucalyptus coolabah*) - Black Box (*Eucalyptus largiflorens*) - River Cooba (*Acacia stenophylla*) association fringes the Narran River and the wetland channels. Understorey species within this community include Lignum, Boobiallah (*Myoporum sp.*), Quinine Bush (*Alstonia constricta*), Umbrella Mulga (*Acacia brachystachya*) and Warrego Grass (*Paspalidium jubiflorum*)

Extensive areas of River Cooba with Lignum occur to the south and a relatively large area of River Red Gum occurs to the north east of Clear Lake. Lignum, River Red Gum, River Cooba and Coolibah all require flooding to grow and regenerate. For example, Lignum is normally best maintained by flooding every 3-10 years and River Red Gum requires flooding at least every 6-10 years, but should not be continuously flooded for more than 18 months (NPWS, 1995). Flooding every 5 years is required to sustain the Lignum and River Red Gum communities with more frequent flooding being necessary to maintain vigour (Mike Maher NPWS, pers. comm.).

The sandy lakeshore and dune areas within the Nature Reserve are generally treeless due to past grazing regimes. Areas with minimal erosion support a scattered cover of Windmill Grass (*Chloris truncata*), Cane Grass (*Eragrostis eriopoda*), Mallee Lovegrass (*Eragrostis deilsii*) and chenopods such as Grey Copperburr (*Sclerolaena diacantha*) and Copperburr (*Sclerolaena decurrens*) (NPWS, 1995).

The sandy ridge country within the Nature Reserve supports a predominantly Bimble Box (*Eucalyptus populnea*) - White Cypress Pine (*Callitris glaucophylla*) woodland community. Other species present within this community include Ironwood (*Acacia excelsa*), Whitewood (*Atalaya hemiglauca*), Budda (*Eremophila mitchellii*), Western Beefwood (*Grevillea striata*), Wilga (*Geijera parviflora*), Ruby Saltbush (*Enchylaena tomentosa*), Goathead Burr (*Sclerolaena bicornis*), Hop Bush (*Dodonaea viscosa* subsp. *angustissima*) and Rice Flower (*Pimelia microcephala*). Old Man Saltbush (*Atriplex nummularia*) occurs occasionally throughout this community and Mulga (*Acacia aneura*) also occurs in small patches in rocky areas (NPWS, 1995).

A Silver-leaved Ironbark (*Eucalyptus melanophloia*) - Kurrajong (*Brachychiton populneus* subsp. *trilobus*) - Coolabah Apple (*Angophora melanoxylon*) - Wilga - Beefwood woodland association occurs on two areas of sandy ridge country within the Nature Reserve. Other species which occur in this community include Spinifex (*Triodia mitchelli*), Wattle (*Acacia murrayana*) and Needlewood (*Hakea leucoptera*).

Common weeds along the Narran River include Noogoora Burr (*Xanthium occidentale*), Bathurst Burr (*Xanthium spinosum*) and African Boxthorn (*Lycium ferrocissimum*) (NPWS, 1995).

17. Noteworthy flora: Lignum (*Muehlenbeckia florulenta*) shrubland, which occurs around Clear and Back Lakes within the Nature Reserve, is considered to be vulnerable and inadequately conserved in NSW (Benson, 1989).

The Silver-leaved Ironbark (*Eucalyptus melanophloia*) - Kurrajong (*Brachychiton populneus* subsp. *trilobus*) - Coolabah Apple (*Angophora melanoxydon*) – Wilga (*Geijera parviflora*) – Beefwood (*Grevillea striata*) woodland association, which is considered to be of conservation significance in the western region of NSW, occurs on two areas of sandy ridge country within the Nature Reserve. Spinifex (*Triodia mitchellii*) and Sandplain Wattle (*Acacia murrayana*), which also occur within this community, are restricted to deep sandy soils and are considered to be poorly conserved in the western region of NSW (NPWS, 1995).

The Old Man Saltbush (*Atriplex nummularia*) shrubland; Mitchell Grass (*Astrebla spp.*) grassland; and Bimble Box (*Eucalyptus populnea*) woodland are all considered to be endangered and poorly conserved in NSW (Benson, 1989).

The Western Beefwood (*Grevillea striata*) – Mulga (*Acacia aneura*) shrubland; Black Box (*Eucalyptus largiflorens*) woodland; Native Fuschia (*Eremophila maculata*) shrubland; Gidgee (*Acacia cambagei*) shrubland; and Common Reed (*Phragmites australis*) sedgeland communities are all considered to be inadequately conserved in NSW (Benson, 1989).

The River Red Gum (*Eucalyptus camaldulensis*) woodland; Silver-leaved Ironbark (*Eucalyptus melanophloia*) woodland; and Ironwood (*Acacia excelsa*) – White Cypress Pine (*Callitris glaucophylla*) shrubland are all considered vulnerable and inadequately conserved in NSW (Benson, 1989).

18. Noteworthy fauna:

See Appendix 1 for the conservation status of fauna species recorded in Narran Lake Nature Reserve.

19. Social and cultural values: Thomas Mitchell was the first known European to travel through the Narran area. His party passed through lignum beds just south of Clear Lake in 1846 on route to the Culgoa River. Settlement of the district by Europeans began soon after Mitchell's visit (Aldis, 1987). Prior to its dedication, the Narran Lake Nature Reserve comprised Western Lands leasehold land primarily used for grazing purposes. Remaining structures within the Nature Reserve include fence lines, ground tanks, bores, stockyard, a boundary riders hut and a shearing shed (NPWS, 1995).

The Narran Lakes area also has a very high traditional, as well as contemporary, social and spiritual significance to the Aboriginal people. Traditionally, the area was a common meeting place for a number of Aboriginal peoples. In present times, the lake area is used by local Aboriginal communities for educational purposes. The Narran area is considered to be significant due to the widespread evidence of Aboriginal people's long-term use of the area; the traditional status of the lakes as a meeting place for the peoples in this region; dreaming paths which lead to the lakes; and Aboriginal people's need for involvement with land which has largely unspoilt areas.

A large number and variety of Aboriginal sites exist within the Narran Lake Nature Reserve. These include shell middens, shell mounds, hearth sites with clay ovens, quarries, artefact scatters and scarred trees in a relatively natural environmental context.

20. Land tenure/ownership: The lands within the Ramsar site include Nature Reserve which is permanently gazetted under the NSW *National Parks and Wildlife Act, 1974* and managed by the NSW National Parks and Wildlife Service, and also Service-owned land that has not yet been gazetted as Nature Reserve. The lands surrounding the Nature Reserve consist mainly of Western Lands leases which are managed by private landholders.

21. Current land use: The lands within the Ramsar site are owned by the National Parks and Wildlife Service and are managed primarily for nature conservation purposes. The lands surrounding the Nature Reserve consist mainly of Western Lands leases managed primarily for grazing of sheep and cattle. Lakebed cropping also occurs in floodplain areas (NPWS, 1995).

22. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land use and development projects:

(a) at the site – Trespassing cattle from neighbouring properties and feral animals (i.e. pigs). These have a minor impact under the current management of the Narran Lake Nature Reserve.

(b) around the site – Immediately surrounding the site, cropping of the main Narran lakebed may potentially alter its wetland values. The relationship between the main lake and the wetlands within the Nature Reserve, in terms of waterbird use, is unclear but probably very important. Conditions attached to cultivation permits issued by the Department of Land and Water Conservation take account of the ecological and cultural values of the area.

Of greatest concern is the impact of continued and increasing levels of water extraction from the Condamine-Balonne Rivers system in Queensland on the Narran wetlands. This extraction has the potential to completely utilise all the relatively frequent small flows which occur, but it is less likely to modify the infrequent, medium and large flows which generate floods. The small flows are critical for maintaining waterbird breeding habitat, particularly in the Lignum and River Red Gum communities. If Narran Lakes only received the infrequent medium and high flows, the quality of breeding habitat would decline to a point where it could not support breeding events of the size previously recorded. Currently, Queensland agencies are conducting a Water Allocation and Management Planning (WAMP) process for the Condamine-Balonne Rivers. This planning process recognises the values of the Narran Lakes and proposes to manage water to maintain these values.

23. Conservation measures taken: The majority of the Ramsar site (82%) has been gazetted as a Nature Reserve under the NSW *National Parks and Wildlife Act, 1974* and the remainder will be gazetted at a later date. A Plan of Management has been developed for the Nature Reserve and is currently being implemented. A draft Water Management Plan is also being prepared for the Nature Reserve. There is an on-going bird monitoring program for the Nature Reserve as well as a pest control plan. A fire management plan and vegetation survey will be completed by mid-1999.

24. Conservation measures proposed but not yet implemented: Should the river flow patterns be changed for the worse, structures may be needed to manage limited flows better. A feasibility study for locating low level regulators at strategic points is being contemplated pending the outcome of the WAMP process. However, this would be a last resort.

25. Current scientific research and facilities:

- Ongoing monitoring of waterbird breeding and numbers;
 - Waterbird monitoring program devised by NPWS Narrabri District;
 - Excavations of oven mounds (Australian Museum archaeologists and local Aboriginal community) and general archaeological studies; and
 - There are currently no on-site facilities.
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26. Current conservation education: The local Aboriginal communities use the Narran Lake Nature Reserve as an educational resource to teach their children about traditional Aboriginal ways of life.

27. Current recreation and tourism: The Ramsar site is gazetted as a Nature Reserve and, as such, existing public use of the area is limited to visits by the Aboriginal community, educational groups and, bird watchers. Public vehicle access to the Nature Reserve is permitted for the above purposes where it will not be detrimental to the natural and cultural heritage values of the area. The National Parks Association/Inland Rivers Network have secured funding for a Wetland Education Officer. Narran Lake Nature Reserve is one of the sites being utilised as part of this project.

28. Jurisdiction:

Territorial: Government of New South Wales
Functional: NSW National Parks and Wildlife Service

29. Management authority:

National Parks and Wildlife Service, New South Wales (Western Zone, Western Region, Narrabri District).

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30. Bibliographical references:

Aldis, R.J. (1987) A Biophysical Description of the Lower Narran Catchment, Western Division of NSW, as a Basis for the Identification of Optimal Land Management Strategies. University of New England Thesis as cited in National Parks and Wildlife Service (1995).

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