



World Heritage Sites

Protected Areas and World Heritage



WILLANDRA LAKES REGION NEW SOUTH WALES, AUSTRALIA

These lakes are the fossil remains of a series of Pleistocene lakes and sand formations which show many stages in the earth's recent evolutionary history, and the continuing geological processes. The area also reveals exceptional archaeological evidence of a past civilisation in relics of human occupation dating from 45,000 years ago. It is a unique landmark in the study of human evolution on the Australian continent. Several well-preserved giant marsupial fossils have also been found here.

COUNTRY Australia - New South Wales

NAME Willandra Lakes Region

MIXED NATURAL & CULTURAL WORLD HERITAGE SERIAL SITE

1981: Inscribed on the World Heritage List under Natural Criterion viii + Cultural Criterion iii.

IUCN MANAGEMENT CATEGORY

Unassigned

BIOGEOGRAPHICAL PROVINCE

Eastern Grasslands and Savannas (6.13.11)

GEOGRAPHICAL LOCATION

Located in the Murray Basin in southwestern New South Wales, 480 km east-northeast of Adelaide, 110 km northeast of Mildura, between 33°8'54" to 34°18'54"S and 142°46'442 to 143°34'40" E.

DATES AND HISTORY OF ESTABLISHMENT

1979: Mungo National Park gazetted under the New South Wales National Parks & Wildlife Act, 1974;

1984: The size of the National Park increased by 13,000 ha to 27,847 ha: proclaimed in Government Gazette #51;

1995: The original World Heritage Property (600,000 ha) reduced in size;

1997-8: Five pastoral leases within the World Heritage site (190,200 ha) bought by the government;

2002: Mungo National Park enlarged by 61,845 ha within the World Heritage site. It is now 90,142.5 ha in area, 57,223 ha being within the property, a quarter of which is now protected. 17,850 ha of pasture also set aside as a State Conservation Area for its mining potential (EA/NPWS,2003).

LAND TENURE

Government of the State of New South Wales, in Balranald and Wentworth shires, 76% is pastureland leased and administered by the state Department of Land and Water Conservation. The remainder, Mungo National Park, is managed by a Joint Management Advisory Committee of the state National Parks and Wildlife Service (NPWS) with elders from the Three Traditional Tribal Groups.

AREA

240,000 ha, including Mungo National Park.

ALTITUDE

Approximately 70m in the centre of the region.

PHYSICAL FEATURES

The Willandra Lakes Region is a now desolate chain of dry lakes. Their interconnected basins were fed in Pleistocene times two million years ago by a branch of the Lachlan River, Willandra Billabong Creek (a billabong is a waterhole) which dried up some 14,000 years ago from south to north. The successive dessication left sediments at each different stage and this fossil landscape remains unmodified. The underlying sediments formed during the lower Tertiary, when marine transgressions in the Murray Basin deposited calcareous sand, marl and limestone which were overlain by sands and dunefields in the Quaternary. The region is characterised by a clay badlands of orange to white aeolian lunette dunes, formed on the eastern shores of the lakes by prevailing westerly winds, and by deflation by the wind. One, in Lake Mungo Park, known as the Walls of China, is 30 km long and in places 30m high. Lake Mungo itself was 10m deep and 13,500 ha in area.

The five major lakebeds, 13 lesser lakebeds and numerous smaller depressions covered an area of 108,800 ha and ranged in size from ephemeral ponds and lakes of 600 ha to Lake Garnpung, which was over 10m deep and over 50,000 ha in area. The western shores form low escarpments. The formation of crescent lunette dunes in sand and clay on the eastern side of the lakes is dated to between 40,000 to 15,000 years ago, with an intensive period of reactivated dune building around 18,000-16,000 BP (AHC, 1980). Formerly the lunettes were wooded, then, bared by overgrazing, they advanced a metre a year but have been stabilised by introduced plants. Where eroded they revealed a rich source of fossils and signs of ancient settlement, preserved by the alkaline sediments. The soils are thin and poorly developed and saline in the lake beds.

CLIMATE

The area has a sub-tropical semi-arid climate. At Ivanhoe, the nearest meteorological station 100 km northeast, the mean February (summer) temperature range is from 17.9°C to 34.6°C; the mean July (winter) temperature range from 3.5°C to 16.4°C. The maximum recorded is 48°C, the minimum, -6.2°C. 302.7mm of rain falls evenly through the year.

VEGETATION

Before drying out the area was rainforest. Now, it is a semi-arid steppe much degraded by past overgrazing. However, it is now recovering where no longer grazed. It is covered by sparse scattered scrub, grasslands and woodland interspersed with sand plains and dunes. Small bushy eucalypts, oil mallee *Eucalyptus oleosa* and water mallee *E. dumosa* are co-dominant. There is an open woodland of white cypress pine *Callitris columellaris*, belah *Casuarina cristata* and cattlebush *Heterodendron oleifolius* with porcupine grass *Trioda irritans*, weeping emubush *Pittosporum phylliraeoides*, wilga tree *Geijera parviflora* on the sandy plains. Senescent groves of *Acacia melvillei* and *A. loderi* woodland remain. Stunted and black bluebrush *Maireana sedifolia*, *M. pyramidata*, bladder and common saltbush *Atriplex vesicaria* and *A. stipulata* grow on the saline lakebeds. The understorey is depauperate through constant overgrazing which encouraged the growth of unpalatable shrubs such as *Nitraria* spp. and *Schlerolaena* spp. (Sundstrom, 2003; EA/NPWS, 2003).

FAUNA

Some 22 mammalian species have been recorded, including red and grey kangaroos *Macropus giganteus* and *M. rufus*, short-nosed echidna *Tachyglossus aculeatus*, 40 species of reptiles and amphibians and several species of bat. There are 137 species of birds resembling those of many similar areas: emu *Dromains novaehollandiae*, pink cockatoo *Cacatua leadbeateri*, mulga parrot *Psephotus varius*, crested bellbird *Oreoia gutturalis*, honeyeaters and finches. The remains of 55 species, 40 no longer found in the region, and the remains of 11 extinct large marsupials site such as Tasmanian tiger and giant short-nosed kangaroo have been found on the site (EA/NPWS,2003).

CULTURAL HERITAGE

Burial by successive layers of sand has preserved the evidence of ancient lives. There was settlement around the lakes, dated by radiocarbon dating of hearths, at least 45,000 years ago. In 1968 at Mungo Lake a 40,000 year old intact cremated female skeleton was discovered (the world's earliest known cremation), and in 1974, a male skeleton nearby, now dated at 42,000 years old ritually decorated with ochre on the remains which was probably imported for decorative use (EA/NPWS, 2003). The discovery of Mungo Man and Woman pushed back estimation of the date of aboriginal settlement of Australia from 8,000 to 50,000 years. Later finds were stone flake tools 20,000 years old and grindstones from a period 10,000 years ago which were used to crush wild grass (AHC, 1980). The people were nomadic hunter-gatherers who also lived on fish and molluscs from the lake but had to adapt after about 20,000 BP to the increasing aridity. The site continued to be inhabited during the last 10,000 years (EA/NPWS, 2003). After sheep-herding squatters settled in 1840, the indigenous tribes were removed to Balranald reservation 130 km south. A woolshed of 1868 remains in good condition, along with the former homestead.

LOCAL HUMAN POPULATION

The Lake Mungo area was the Mungo sheep station until 1981; some buildings remain. The rest of the World Heritage site was also in sheep. There were fewer than 40 inhabitants in the 1980s. The indigenous tribes are the Paakantji, Mutthi Mutthi and Ngayampaa.

VISITORS AND VISITOR FACILITIES

The attraction is the 'moonscape' of the dunes, and the aboriginal archaeological sites. Visitation is confined to the National Park. It was approximately 40,800 in 2001, peaking in the winter and school holidays (EA/NPWS, 2003). The visitors' centre has an informative display, two short trails and a 65 km self-drive tour with signed stops. To point out and interpret the archaeology a guide is essential. The Park's boundary is signed and maps and brochures have been prepared. There are two campsites, beds in a former shearers quarters, pit toilets and tank water and a lodge and restaurant just outside the Park (Anon, 2004).

SCIENTIFIC RESEARCH AND FACILITIES

The site is of great geomorphological and archaeological interest and much research has been undertaken on it: a Mungo workshop held in 1989 included research and papers on archaeology and geomorphology. The remains of hearths some 30,000 years old provide an ideal source for palaeomagnetic measurements because of their resistance to erosion. Research on them has determined that there was a variation of 120° in earth magnetism some 30,000 years ago. Consequently, the area remains one of the benchmarks in studies of changes in the earth's magnetism (AHC, 1980). The stratigraphy, soils and geochemistry of the landscape provide a valuable resource for palaeological and archaeological research, important to the understanding the earliest development of man. The 1996 Plan of Management provides a bibliography covering geology, geomorphology, biodiversity, ecology, archaeology, social value, history, linguistics and aboriginal history, management and unpublished reports, theses and dissertations.

CONSERVATION VALUE

The Willandra Lakes provide excellent conditions for recording the events of the Pleistocene Epoch, demonstrating how an unglaciated zone responded to the major glacial-interglacial fluctuations. They demonstrate the close interconnection between landforms and archaeomagnetism, radio-carbon dating, climatology, palaeochemistry, palaeoecology, archaeology and faunal extinction (AHC, 1980). The early human remains establish that modern man had reached southern Australia at least 50,000 years ago, define the topology of early stone tools and illustrate man's adaptations to a changing climate. The Park lies within a WWF Global 200 Freshwater Eco-region and in one of the world's Endemic Bird Areas.

CONSERVATION MANAGEMENT

Approximately 90% of the Willandra Lakes Region was initially divided into 16 pastoral stations, leased from the Crown and administered by the state Department of Land and Water Conservation. The remaining land comprised Mungo National Park, managed by the National Parks and Wildlife Service (NPWS). There are now fewer leaseholds and the National Park covers 24% of the area.

Administration of the whole region is jointly undertaken by these two state agencies. Draft management plans were completed for Mungo National Park and the Willandra Lakes Region in 1989. The Commonwealth and New South Wales Governments established an administrative and management planning arrangement for the World Heritage property to which the Willandra Lakes Region Property Plan of Management, released in February 1996 provides statutory effect. This included the formation of a Ministerial Council, a Community Management Council, a Technical and Scientific Advisory Committee and the Three Traditional Tribal Groups Elders Council. The inclusion of the elders should ensure that the former tribes of the area now help to protect and manage it (AHC,1980).

The Plan of Management identified the World Heritage values of the area and provided a strategy and guidelines for their development, protection and conservation. Individual property plans were developed determining site specific activities for leasehold land in the area. Monitoring focuses on burials, giant animal remains and other archaeological sites, on rangeland vegetation cover and soil and on erosion of landscape features. In 2003 a new National Park management plan and a plan for the Willandra Lakes Region was in preparation, also an employment strategy and feasibility study for a Keeping-Place, Education and Research Centre (EA/NPWS, 2003).

MANAGEMENT CONSTRAINTS

The area is remote and not subject to much development. However, outside Lake Mungo Park, substantial areas were for some years still sub-leased for grazing by the Department of Land and Water Conservation, supplied from watering points. This overgrazing by sheep and cattle impoverished the understorey and left the land scalded. Feral animals such as rabbits and kangaroos continue the pressure. Only where this stops does the native vegetation begin to recover. Funding is project-based and intermittent, making for difficulty in the continuing management and maintenance, and in planning for staffing and monitoring. Mining for mineral sands in adjacent land is being considered. There is some tourist erosion, alleviated by boardwalks on the Walls of China to a viewpoint (EA/NPWS, 2003).

STAFF

The Willandra Lakes World Heritage Region has one Executive Officer funded by the Commonwealth government and is supported by the staff and administration of the New South Wales NPWS and Environment Australia (EA/NPWS, 2003).

BUDGET

Funded through the joint State-Commonwealth Ministerial Council on a project-by-project basis. Funding for management also comes from the Commonwealth National Heritage Trust (EA/NPWS, 2003).

LOCAL ADDRESSES

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Department of Land and Water Conservation, P O Box 1840, Dubbo, NSW 2830, Australia.

REFERENCES

The principal source for the above information was the original nomination for World Heritage status.

Allen, H. (1990). Environmental history in southwestern New South Wales during the Pleistocene. In Gamble, C. & Soffer, O. *The World at 18,000 BP: Low Latitudes*. Unwin-Hyman, London. Pp 296-321.

----- (1990). Human occupation and environmental change: The ancient record from the Willandra Lakes. In Noble, J. *et al. The Mallee land: A Conservation Perspective*. Commonwealth Scientific, Industrial and Research Organisation, Melbourne.

Anon. (2004). Walkabout. Australian Tourist Guide.
www.walkabout.com.au/locations/nswlakemungo.shtml.

Australian Heritage Commission (AHC) (1980). *Nomination of the Willandra Lakes Region for Inclusion in the World Heritage List*. Canberra. 28pp.

Boles, W. & McAlland, A. (1985). *An Inventory of the Birds of the Willandra Lakes Region World Heritage Region*.

Bowler, J. (1976). Aridity in Australia: Age, origin and expression on aeolian landforms and sediments *Earth Science Reviews* 12: 279-310.

----- & Thorne, A. (1976). Human remains from Lake Mungo skeleton. Discovery and excavation of Lake Mungo III. In Kirk, R. & Thorne, A. *The Origin of the Australians*. Institute of Aboriginal Studies, Canberra.

----- *et al.* (2003). New ages for human occupation and climatic change at Lake Mungo, Australia. *Nature* 421:837-840, London.

Environment Australia / NSW NPWS (2003). *Australian National Periodic Report, Section II. Report on the State of Conservation of the Willandra Lakes Region*. Environment Australia, Canberra. 43 pp. [Contains a bibliography of 137 references.]

Fatchen, T. *et al.* (1992). *A Draft Plan of Management for the Willandra Lakes Region*. Department of Conservation and Land Management/National Park and Wildlife Service.

Flood, J. (1983). *Archaeology of the Dreamtime*. Collins.

Fox, A. (1992). *Mungo National Park Guidebook*. NSW NPWS, Broken Hill.

Green, D. (1988). *List of Species. Willandra Lakes World Heritage Area*. Report to the Soil Conservation Service, New South Wales.

Johnston, H., Clark, P. & White J.(eds) (1998). Willandra Lakes: People and palaeoenvironments. In *Archaeology in Oceania* 33(3):105-119. University of Sydney/ New South Wales National Parks & Wildlife Service and Willandra Lakes Region World Heritage Area Management Council.

Milne, A. & O'Neill, A. (1990). Mapping and monitoring land cover in the Willandra Lakes World Heritage region New South Wales, Australia. *International Journal of Remote Sensing*, 11(11):2035-2050.

Porteners, M. & Ashby, L. (1996). *Plants of Pooncarie and the Willandra Lakes. A Guide to the Plant Species Native to Pooncarie and the Willandra Lakes Region in South-western New South Wales*. Royal Botanic Gardens, Sydney.

Sadleir, R. (1985). *Fauna Study: Reptiles and Amphibians of the Willandra Lakes Region World Heritage Region*. Report prepared for the Willandra Lakes Region World Heritage Consultative Committee. Herpetology Department, Australian Museum, Sydney.

Sundstrom, A. (2000). Old Man Melvillei. *Vegetation Survey of the Potential Additions to Mungo National Park*. National Parks Association of New South Wales. 2pp.

Thorman, R. (1994). *Willandra Lakes Region World Heritage Property Strategic Issues*. Document prepared for the Department of the Environment Sport and Territories. 53 pp.

Tidemann, C. (1988). A survey of the mammal fauna of the Willandra Lakes World Heritage region, New South Wales, Australia. *Australian Zoologist* 24(4):197-204.

Webb, S. (1989). *The Willandra Lakes Hominids*. Dep't of Prehistory, Australian National University.

World Heritage Australia (1996). *Willandra Lakes Region World Heritage Property: Plan of Management*. Prepared for the Commonwealth Dept. of Environment, Sport & Territories. Includes bibliography.

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