
AUSTRALIAN NATIONAL PERIODIC REPORT

SECTION II

Report on the State of Conservation of Kakadu National Park

II.1. INTRODUCTION

a. State Party

Australia

b. Name of World Heritage property

Kakadu National Park

c. Geographical coordinates to the nearest second

Kakadu National Park is located in northern Australia, between latitudes 12 degrees 04 minutes south and longitudes 131 degrees 52 minutes and 133 degrees east.

d. Date of inscription on the World Heritage List

Kakadu National Park was listed on the UNESCO World Heritage List in three successive stages for its cultural and natural values: 26 October 1981, 9 December 1987 and December 1992, the full extent of the Park was inscribed.

e. Organisation(s) or entity(ies) responsible for the preparation of the report

This report was prepared by Parks Australia, in association with the Heritage Management Branch of Environment Australia.

II.2. STATEMENT OF SIGNIFICANCE

Criteria

Kakadu National Park was inscribed on the World Heritage List in recognition of its outstanding natural and cultural universal values.

Natural - Criteria 44(a) ii; iii; iv

- Outstanding examples representing significant ongoing geological processes, biological evolution and man's interaction with his natural environment;
- Unique, rare or superlative natural phenomenal formations or features or areas of exceptional natural beauty; and
- The most important and significant habitats where threatened species of plants and animals of outstanding universal value from the point of view of science and conservation still survive.

On the basis of the ICOMOS evaluation of the renomination of the full extent of the Park, Kakadu National Park was inscribed in the following criteria, instead of criteria i, iii and vi:

Cultural - Criteria 24(a) i; vi

- Representing a unique artistic achievement, a masterpiece of a creative genius; and
- Be directly or tangibly associated with events or with ideas of beliefs of outstanding universal significance.

Justification for Listing

The coastal riverine and estuarine flood plains of the South Alligator, West Alligator, East Alligator, and Wildman rivers in Kakadu National Park provide important examples of ongoing geological processes and illustrate the ecological effects of sea-level change in northern Australia.

The geomorphology and ecology of these coastal floodplains have undergone considerable change in a relatively short geological period. These changes provide a useful record of the development of freshwater floodplains and the successional responses of mangrove environments across northern Australia.

In comparison with the rest of the Australian continent, the environments of north Australia have been little affected by European settlement. Attributes contributing to the natural values include:

- The scale and integrity of landscapes and environments, including extensive and relatively unmodified vegetation cover and largely intact faunal composition;
- High flora and fauna species diversity;
- Rare and endangered species;
- Habitat heterogeneity; and
- Endemic plant and animal species.

Kakadu National Park contains a variety of habitats and vegetation types, including:

- Open forest and woodlands;
- Lowlands and sandstone monsoon rainforests;
- Wetland, riverine, and coastal environments;
- Mangroves and floodplains; and
- Shrubland and heath.

The diversity of landscapes, habitats and species of Kakadu National Park, combined with its vast size, are attributes of significant conservation value and provide an excellent environment for the continuation of ecological processes. This great diversity and size enhances the ability of ecosystems and species within the Park to respond to and recover from natural disturbances and catastrophic events.

Kakadu National Park is a landscape of cultural, religious and social significance to local Aboriginal people. Special places in the landscape include ceremonial places, sites of religious significance, archaeological and rock art sites and other areas that have special meaning to Aboriginal people. These sites both reflect the long history of Aboriginal occupation of the landscape and remain central to Aboriginal culture in the region.

Kakadu contains the habitats of a variety of species which are of outstanding scientific and conservation value. These include species listed as rare or threatened, species

recognised as having special conservation status under international treaties, and species which have experienced drastic range reductions, or are of particular interest, such as relict species.

Several important plant associations are also restricted to Kakadu National Park, including endemic species and relict species of high conservation value.

The Park contains features of great natural beauty and magnificent sweeping landscapes. The on-ground attributes which contribute to the values of Kakadu include:

- Expansive and varied landscapes including coastline, wetlands, floodplains, the Arnhem Land Plateau and outliers;
- Exceptional natural beauty of viewfields;
- Unusual mix and diversity of habitats found in such close proximity; and
- Scale of undisturbed landscape.

The north of the Park is characterised by extensive lowlands and a vast expanse of wetlands. These extensive wetlands are listed under the Convention on Wetlands of International Importance, especially as Waterfowl Habitat (the Ramsar Convention). The Ramsar wetlands comprise catchments of two large river systems, the East and South Alligator Rivers, seasonal creeks and the lower reaches of the East Alligator River, the Magela Creek floodplain, the West Alligator River system, and nearly all the Wildman River system. The wetlands support about one million waterbirds of over 60 species, as well as many other vertebrate and invertebrate species. The two river systems of the wetlands are outstanding examples of the series of large rivers of the Torresian monsoonal biogeographic region draining to the Arafura Sea.

Kakadu contains one of the greatest concentrations of rock art in the world. It is estimated that there are more than 15 000 rock art sites in the escarpment and plateau country, of which some 5 000 have been recorded by Park staff. Many of these sites contain a large number of individual paintings. Areas of particular significance for rock art include Cannon Hill, Ngarradj Warde Djobkeng, the Nourlangie-Mt Brockman massif, Ubirr, Namarrgon Djahdjham, and Deaf Adder Creek.

A significant aspect of the art is the range of art forms and styles found in Kakadu. This includes hand and other stencils, depictions of animals and humans, battle and hunting scenes, and elaborate multicoloured X-ray art. Drawings in beeswax and 'contact art', which depicts the first contact of Aboriginal people with the Macassan and European cultures, are also found in the Park.

A strong association exists between Aboriginal cultural sites (including rock art sites) and the living traditions and beliefs of Aboriginal people in the Park. This association continues in the social and cultural activities of communities today. Paintings reflect the history of Aboriginal occupation of the landscape, can portray the spiritual figures that created the landscape and embody the cultural beliefs and traditions of Aboriginal people in the region.

In addition to their religious significance, rock paintings also provide a valuable storehouse of traditional knowledge, showing objects, animals and activities familiar to Aboriginal people today, mythological heroes, and paintings of religious and ceremonial life. Paintings were often used for teaching children, for artistic expression,

as a record of events such as a successful hunt, and to illustrate stories. The rock art of Kakadu continues to be an important storehouse and reference of traditions and knowledge for contemporary generations of Aboriginal traditional owners.

Kakadu reflects an outstanding example of a landscape that has evolved in company with continuing Aboriginal occupation and 50,000 years of a hunting and gathering culture. Occupation sites provide evidence of early human occupation of the Australian continent, dating as far back as 50,000 years, they also provide a valuable record of human responses and adaptation to environmental changes since that time.

Aboriginal people have an important spiritual bond with the land. Their spiritual belief centres on spirit beings from the creation era, who emerged to give form and life to the earth. At the end of their work, these beings departed or rested in the landscape. They retained their powers to influence the life of humans and are considered to be a vital force in the continuation of human life, local Aboriginal culture and the productivity of the land.

Throughout Kakadu National Park lies a collection of places and landscapes associated with these spirit beings which are of significant cultural, religious or social importance to the Aboriginal people.

Traditional beliefs and practices remain important in the daily life of Aboriginal communities and rites and ceremonies continue to be practiced. The continuing ability of these communities to undertake and develop the cultural practices, traditions and customs associated with caring for country, contributes to the values of Kakadu as a World Heritage Area.¹

Indicative Values Table

The EPBC Act prohibits actions that have “a significant impact on the World Heritage values of a declared World Heritage property”, unless the action is approved, or in accordance with an accredited management plan. The World Heritage values of a property are the natural heritage and cultural heritage contained in the property, which have the same meaning given by the World Heritage Convention.

The following indicative World Heritage values table includes examples of the World Heritage values for which Kakadu National Park was listed for each World Heritage List criterion. These are, in the Commonwealth’s view, the statements of the outstanding universal values of each World Heritage property. While these examples are illustrative of the World Heritage values of the property, they do not necessarily constitute a comprehensive list of these values.

¹ Environment Australia; *Australia’s Kakadu – Protecting World Heritage; Response by the Government of Australia to UNESCO World Heritage Committee Regarding Kakadu National Park*; April 1999, Pages 6-11

<p>Natural and cultural criteria against which Kakadu National Park was inscribed on the World Heritage List in 1992, following original listing in 1981 and initial expansion in 1987.</p>	<p>Examples of World Heritage values of Kakadu National Park for which the property was inscribed on the World Heritage List in 1992, following original listing in 1981 and initial expansion in 1987.</p>
<p>Natural criterion (ii) outstanding example representing significant ongoing geological processes, biological evolution and man's interaction with his natural environment.</p>	<p>Kakadu National Park is an outstanding example representing significant ongoing geological processes, particularly associated with the effects of sea-level change in northern Australia, biological evolution and people's interaction with their natural environment. The World Heritage values include:</p> <ul style="list-style-type: none"> • the coastal riverine and estuarine flood plains of the South Alligator, West Alligator, East Alligator, and Wildman rivers, which include freshwater flood plains with tidal river channels; • the relatively undisturbed nature of the river systems and their associated catchments; • the mangrove swamps, including remnants of more extensive swamps which formed between 6,500 and 7,000 years ago on the coastal fringe and plains; • the spatial zonation of the coastal and floodplain vegetation which exemplifies a vegetation succession linked to processes of sea-level change and sedimentation and extends from lower intertidal mangroves to estuarine mangroves to floodplain vegetation; • the range of the environmental gradients and contiguous, diverse landscapes, extending from the sandstone plateaus and escarpments through lowland areas and wetlands to the coast, which have contributed to the evolution of high levels of endemism and species diversity; • the scale and integrity of the landscapes and environments with extensive and relatively unmodified vegetation cover and largely intact faunal composition which are important in relation to ongoing evolutionary processes in an intact landscape; • the high spatial heterogeneity of habitats; • the high diversity and abundance of plant and animal species, many of which are adapted to low-nutrient conditions (including more than 1600 plant species, over one-quarter of Australia's known terrestrial mammal, about one-third of the total bird fauna and freshwater fish species, about 15 per cent of Australia reptile and amphibian species and a high diversity of insect species); • the Aboriginal archaeological remains and rock art which represent an outstanding example of people's interaction with the natural environment and bear remarkable and valuable witness to past environments in northern Australia and to the interaction of people with these environments; • the ongoing, active management of the landscapes by Aboriginal people through the use of fire, including fire-assisted hunting and the creation of environmental mosaics which contribute to species diversity, provide an important example of people's interaction with the

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	<p>environment: and</p> <ul style="list-style-type: none"> • the diverse range of habitats and vegetation types including: <ul style="list-style-type: none"> - open forest and woodlands; - lowland and sandstone (<i>Allosyncarpha ternata</i> closed forest) rainforests; - shrubland and heath; - wetland, riverine, and coastal environments; - mangroves and floodplains.
<p>Natural criterion (iii) contain unique, rare or superlative natural phenomena, formations or features or areas of exceptional natural beauty.</p>	<p>Kakadu National Park has features of exceptional natural beauty and aesthetic importance and contains superlative natural phenomena. The World Heritage values include:</p> <ul style="list-style-type: none"> • the expansive and varied natural landscapes which include coastal areas, lowlands, wetlands, floodplains, plateau complexes, escarpments and outliers; • the exceptional natural beauty of viewfields; • the relatively undisturbed nature of the landscape; • the unusual mix and diversity of habitats found in close proximity; and • the large scale of undisturbed landscape.
<p>Natural criterion (iv) contain the most important and significant habitats where threatened species of plants and animals of outstanding universal value from the point of view of science and conservation still survive.</p>	<p>Kakadu National Park's large size, its diversity of habitats and its position in an area of northern Australia subjected to considerably less disturbance by European settlement than many other parts of the continent have resulted in the protection and conservation of many significant habitats, including those where threatened species of plants and animals of outstanding universal value from the point of view of science and conservation still survive. The World Heritage values include:</p> <ul style="list-style-type: none"> • the wide range of natural habitats, including: <ul style="list-style-type: none"> - open forest and woodlands; - monsoon rainforest areas; - heaths and shrublands; - freshwater wetlands; - mangrove and estuarine areas; - foreshore and beach areas; • significant plant associations, including those associated with <i>Eucalyptus koolpinensis</i>, the heath vegetation on the margins of the Marrawal Plateau, and woodland containing <i>Terminalia platyptera</i> on Snake Plains; • plant species of conservation significance (including endemic species and relict species) such as <i>Arthrochilus byrnessii</i>, <i>Cycas conferta</i>, <i>Desmodium sp. 2</i>, <i>Eucalyptus koolpinensis</i>, <i>Hildegardia australiensis</i>, <i>Micraira</i> spp., <i>Neobyrnesia suberosa</i>, <i>Pityrodia</i> spp., <i>Plectrachne aristiglumis</i>, <i>Triodia radonensis</i>, <i>Typhonium russell-smithii</i>; • animal species of conservation significance, including:

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	<ul style="list-style-type: none"> - mammals (such as Calaby's mouse <i>Pseudomys calabyi</i>, Kakadu dunnart <i>Sminthopsis</i> sp. Nov., nabarlek <i>Petrogale concinna</i>, false water rat <i>Xeromys myoides</i>, golden backed tree rat <i>Mesembriomys macrurus</i>, and ghost bat <i>Macroderma gigas</i>); - reptiles (such as the pig-nosed turtle <i>Carettochelys insculpta</i>, Pacific or olive ridley turtle <i>Lepidochelys olivacea</i>, green turtle <i>Chelonia mydas</i>, loggerhead turtle <i>Caretta caretta</i>, saltwater crocodile <i>Crocodylus porosus</i> and freshwater crocodile <i>C. johnstoni</i>); - birds (such as the Gouldian finch <i>Erythrura gouldiae</i>, partridge pigeon <i>Geophaps smithii</i>, hooded parrot <i>Psephotus dissimilis</i>, little tern <i>Sterna albifrons</i>, masked owl - northern subspecies <i>Tyto novaehollandiae kimberli</i> and red goshawk <i>Erythrotriorchis radiatus</i>); - invertebrates (such as crustaceans of the plateau and escarpment streams, especially the families Amphispodidae, Atyidae and Palaemonidae); - fish (such as two newly discovered taxa of goby, including the new genus <i>Cryptocentrus</i>, and a speartooth shark <i>Gyphis</i> sp); - species which have experienced range reductions (such as the magpie goose <i>Anseranas semipalmata</i>, Gouldian finch <i>Erythrura gouldiae</i>, partridge pigeon <i>Petrophassa smithii</i>, pale field rat <i>Rattus tunneyi</i> and Leichhardt's grasshopper <i>Petasida ephippigera</i>); and - endemic species and relict species (including the ghost bat <i>Macroderma gigas</i>, the orange horseshoe bat <i>Rhinonicteris aurantius</i>, saltwater crocodile <i>Crocodylus porosus</i>, freshwater crocodile <i>C. johnstoni</i>, and the pignosed turtle <i>Carettochelys insculpta</i>).
<p>Cultural criterion (i) represent a unique artistic achievement and a masterpiece of the creative genius.</p>	<p>The rock art sites of Kakadu National Park represent a unique artistic achievement, spanning a continuum tens of thousands of years to the present and continuing to maintain an important function in the cultural and social aspects of contemporary indigenous communities. The World Heritage values include:</p> <ul style="list-style-type: none"> • rock art sites which: <ul style="list-style-type: none"> - in themselves represent a unique artistic achievement and which comprise one of the greatest concentrations of rock art in the world; - are of great antiquity and which represent a continuous temporal span from the Pleistocene Epoch to the present; - exhibit great diversity, both in space and through time, yet embody a continuous cultural development; and - demonstrate in the record of the art sites a living cultural tradition which continues today.

<p>Natural and cultural criteria against which Kakadu National Park was inscribed on the World Heritage List in 1992, following original listing in 1981 and initial expansion in 1987.</p>	<p>Examples of World Heritage values of Kakadu National Park for which the property was inscribed on the World Heritage List in 1992, following original listing in 1981 and initial expansion in 1987.</p>
<p>Cultural criterion (vi) directly or tangibly associated with events or with ideas or beliefs of outstanding universal significance.</p>	<p>Kakadu National Park is associated with events, ideas and beliefs of outstanding universal significance. The World Heritage values include:</p> <ul style="list-style-type: none"> • cultural sites which: <ul style="list-style-type: none"> - form a rich collection of places imbued with strong spiritual associations relating to creator beings and are connected to the continuing practice of traditional beliefs and practices; - demonstrate in the art and the archaeological record a living cultural tradition that continues today; - are of great antiquity and represent a continuous temporal span from the Pleistocene Epoch to the present; - include archaeological sites which are currently some of the oldest dated within Australia; - exhibit great diversity, both in space and through time, yet embody a continuous cultural development; - preserve a record, not only in the form of archaeological sites but also through rock art, of human responses and adaptation to major environmental change including rising sea levels; and - preserve fragile items of material culture not commonly found within other archaeological sites.

Additional Information Since Listing

Although not inscribed on the World Heritage list as a cultural landscape, the current Plan of Management identifies Kakadu National Park as a cultural landscape, shaped by many generations of Traditional Owners. The Kakadu Board of Management has previously discussed the possibility of Kakadu National Park being nominated to the World Heritage List as a cultural landscape. The Australian Government continues to emphasise the need for consultation with Traditional Owners before a decision is made on any possible nomination of Kakadu National Park, the greater Kakadu Region or Kakadu National Park and the East Alligator River catchment as a World Heritage cultural landscape.²

II.3. STATEMENT OF AUTHENTICITY/INTEGRITY

Authenticity / Integrity

Kakadu National Park was included on the World Heritage List in three successive stages. The Stage III consolidated nomination (1991), reported that most of the

² Environment Australia; *Australia's Commitments: Protecting Kakadu – Progress Report to the Bureau of the World Heritage Committee*; 15 April 2000; Pages 8 - 9

Aboriginal rock paintings were in a good state of preservation, as a result of their position within rock shelters and the characteristics of the rocks and the paint. The state of preservation of ceremonial sites with cultural remains, such as stone and bone arrangements, varied considerably; with bone arrangements being affected by natural weathering processes, while the stone arrangements were in excellent condition. It was also reported that some illegal collection of stone artefacts had occurred at some of the more accessible sites.

The Park was reported as being large, diverse and ecologically intact, with surrounding areas providing a very good buffer against external, potentially adverse, influences. The intact faunal composition attributed to much of the outstanding conservation significance of the Park, and evidence suggests that very few species have been lost from the area since the arrival of non-Aboriginal people. Also, the number of alien plants and animals was quite low, no established introduced bird species and only six known introduced mammal species. It was noted that there were some introduced plant and animal species requiring control or eradication to ensure the long-term protection of the ecology of the area, including, water buffalo (*Bubalus bubalis*), *Mimosa pigra* and *Salvinia molesta*.

The IUCN Summary of the Nomination (1992) stated that the Park was being actively managed to ensure that minimal damage was caused by weeds, feral animals, fire, past mining activities, tourism and other human use. It noted the potential threat from an existing uranium mine within an enclave in the park, but, to date, controls had been effective.

The IUCN Technical Evaluation (March 1992) noted that Kakadu, in many ways, had become a model of effective park management, and the authorities should be commended for a solid and well-funded field programme, and also for taking difficult decisions on mineral extraction that have had positive consequences on conservation of the Park. Other issues of note included:

- further action to control *salvinia* to be encouraged;
- given the jump in visitation to the Park, it was important to ensure tourist activities were appropriate;
- the draft environmental impact report on the Mount Bunday military training area had been received, and the values of the Park would not be significantly affected;
- the cessation of land degradation from small-scale mining and over-stocking and undertaking of restoration measures;
- consideration be given to a regular training course sponsored by Kakadu for other World Heritage and RAMSAR site managers; and
- the prospects of further mining activity had been eliminated, but the future potential effects of uranium mining outside the Park deserved on-going scrutiny.

Australia has provided numerous reports to the World Heritage Committee regarding the protection of the World Heritage values of the property, including responding to calls for the Park to be included on the World Heritage In Danger List. Further information on this can be found within the Responses to World Heritage Committee of Bureau State of Conservation Reports section.

Maintenance of Values

More than 1600 plant species still occur in Kakadu, including some 70 species considered to be rare or threatened. It contains 289 bird species, 64 mammal species, and 55 species of freshwater fish have been recorded. Also, additional species have been identified in the Park since inscription, including the vulnerable Freshwater Sawfish (*Pristis microdon*) and Speartooth Shark (*Glyphis sp.*), and there is anecdotal evidence of a new species of goanna – named birram in the Gundjehmi language of central Kakadu.

Within the Park there are places that the Traditional Owners have agreed may be used as major visitor sites and others for quiet (low intensity) visitor use. There are also some areas where general tourism activities cannot take place at all, in order to provide for the conservation of the natural and cultural heritage of the Park and for Aboriginal use.³ This delineation of areas assists in providing adequate conservation measures for the Park, thereby maintaining the cultural and natural values of the Park. Tourist facilities have been constructed since the Park was inscribed on the World Heritage List, in order to balance the maintenance of values with the increasing numbers of tourists to the region. The Bowali Visitors Centre at Park Headquarters is a significant facility within the Park. It provides high quality interpretative and presentational material to visitors of the Park. In 1995 the Warradjan Aboriginal Cultural Centre near Coinda opened, which also provides visitors with a valuable introduction into the natural and cultural values of Kakadu.

Other tourist facilities within the Park include lookouts, viewing and observation platforms, roads, picnic areas, interpretive displays, walking tracks and seasonal interpretation. Boardwalks at Yellow Waters and Maguk have been constructed to allow visitors to experience the World Heritage values of the area. These facilities have been constructed to a high standard and have minimal impact on the Park. The World Heritage values of the monsoon rainforest are well protected from any impact from visitors. The boardwalks which have been constructed at Yellow Waters and Maguk allow visitors to experience the World Heritage values of the monsoon rainforest while having a minimal impact on the rainforest.

The cultural values of Kakadu are maintained through the continual involvement of Traditional Owners in the direct day-to-day management of the Park as well as decision making about Park management priorities and programs.

The Jabiluka mine project, adjacent to and outside of the World Heritage Area, is currently on standby and environmental monitoring mode. The Supervising Scientist, on numerous occasions has confirmed that operations on the Jabiluka and Ranger lease areas have had no adverse impact on the World Heritage values of Kakadu National Park. Further information on this issue is included within the Responses to World Heritage Committee and Bureau State of Conservation Reports section.

Boundaries and Buffer Zones

Kakadu National Park was included on the World Heritage List in three stages.

³ *Ibid*; Page 108

The northern boundary is coastline; the eastern boundary is Arnhem Land, which is Aboriginal land. To the south the Mary River forms a readily identifiable natural boundary, and Nitmiluk (Katherine Gorge) National Park is nearby.⁴

There are also three mineral leases that pre-exist the establishment of the Park and are outside the Park boundaries. These are the Ranger, Jabiluka and Koongarra mineral lease areas, with the Ranger uranium mine being the only operational mine in the region.

II.4. MANAGEMENT

International Obligations and Commitments

The north of the Park is characterised by extensive wetlands, which are listed under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention). The Ramsar wetlands comprise the catchments of the Magela Creek floodplain, the West Alligator River system and nearly all the Wildman River system. The wetlands support about one million waterbirds of over 60 species, as well as many vertebrate and invertebrate species.

Kakadu is also subject to international treaties for the protection of other wildlife and habitats, including the:

- Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA). Forty-six of the 76 birds listed under this agreement are found in the Park;
- Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment (CAMBA). Fifty of the 81 birds listed under this agreement occur in the Park; and
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention). Twenty-one of the species listed under this Convention are found in Kakadu.

Kakadu is also involved in an international Tri National Wetlands Conservation Agreement being developed by the World Wide Fund for Nature Australia. This project aims to exchange expert knowledge in managing wetlands with local indigenous people from Kakadu, Wasur National Park (Irian Jaya) and the Tonda Wildlife Management Area (Papua-New Guinea).

The Section I of the State Party report provides further information on international obligations and commitments relevant to Kakadu National Park.

National Legislation and Controls

The legislative foundation for the joint management arrangements applying to Kakadu National Park is found in the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Aboriginal Land Rights (Northern Territory) Act 1976*.

⁴ Nomination Document (1992)

The EPBC Act provides protection for World Heritage properties. The EPBC Act provides for the management of World Heritage areas through the requirement of the preparation of a Management Plan for each World Heritage area. The Act also establishes the joint management arrangements for the Park, through the establishment of the Kakadu Board of Management.

Further information on the operation of the EPBC Act can be found at <http://www.ea.gov.au/epbc/assessapprov/nes/worldheritage.html> in relation to the way in which protection is afforded to World Heritage areas under this Act.

In recognition of the unique environment of the Kakadu region, statutory environmental measures are established in addition to those available under the EPBC Act. The *Environment Protection (Alligator Rivers Region) Act 1978* specifically provides for the protection of the environment of the Alligator Rivers Region, and ongoing scrutiny of the environmental effects of mining. The Region includes the area covered by Kakadu National Park.

Under the *Environment Protection (Alligator Rivers Region) Act 1978* the independent Supervising Scientist is responsible for overseeing monitoring, reporting, and supervising to protect the environment of the Alligator Rivers Region from the potential impacts of uranium mining activities. The Supervising Scientist ensures protection of the environment by providing:

- (i) independent and expert advice based on scientific research and monitoring undertaken by the Environmental Research Institute of the Supervising Scientist (ERISS);
- (ii) environmental audit and technical review of the mining operations; and
- (iii) standards, practices and procedures for environmental protection.

Further information on the Supervising Scientist Division can be accessed at: <http://www.ea.gov.au/ssd>.

Other national legislation relevant to the management of Kakadu National Park includes:

- *Australian Heritage Commission Act 1974*
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
- *Native Title Act 1993*
- *Aboriginal Land Rights (Northern Territory) Act 1976*
- *Jabiru Town Development Authority Act 1978*

National controls of relevance to the management of the values of Kakadu include Australia's National Water Quality Management Strategy. The Management Strategy includes the recently published *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. The Guidelines include a philosophy and provision for protection of aquatic ecosystems of high conservation value, such as those contained in Kakadu National Park.

State Legislation and Controls

Northern Territory laws apply to the Park and people in the Park in so far as those laws are not inconsistent with the EPBC Act and Regulations or other Commonwealth laws.

They must also not interfere with the performance of functions and exercise of powers by the Director of National Parks. Northern Territory laws which may be of relevance to the Park include those relating to criminal and illegal activities, sacred sites and heritage, traffic and motor vehicles, work health and occupational safety and the provision of services.

The Northern Territory statutes that have particular relevance to the management of Kakadu National Park are listed below:

- *Northern Territory Aboriginal Sacred Sites Act 1989*
- *Territory Parks and Wildlife Conservation Act 1995*
- *Heritage Conservation Act 1991*
- *Marine Act*
- *Fisheries Act*
- *Planning Act 1999*

Management Arrangements

Administrative and Contractual Arrangements

Approximately 50% of the land in the Park is Aboriginal land under the *Aboriginal Land Rights (Northern Territory) Act 1976* and much of the remaining area of land is under claim by Aboriginal people. Title to Aboriginal land in the Park is held by Aboriginal land trusts.

Aboriginal Land Trusts lease the land to the Director of National Parks for the purpose of a national park. This lease was executed in November 1978; and on 27 March 1991, revised lease agreements covering Aboriginal land in the Park were signed between the then Director of National Parks and Wildlife and both the Kakadu and Jabiluka Aboriginal Land Trusts. On 31 January 1996 a memorandum of lease was signed between Gunlom Aboriginal Land Trust and the Director of National Parks for managing Jawoyn lands in the south of the Park.

The lease agreements provide for Traditional Owners and relevant Aboriginals:

- the right to continue, in accordance with Aboriginal law, the traditional use of any area of the Park for hunting or food gathering (otherwise than for purposes of sale);
- the right to continue the traditional use of any area of the Park for ceremonial and religious purpose; and
- subject to the provisions of the Plan of Management, the right to reside within the Park.

The Director of National Parks also agreed to lease covenants, including:

- to encourage the maintenance of the Aboriginal tradition of relevant Aboriginals;
- to promote and protect the interests of relevant Aboriginals;
- to encourage Aboriginal business and commercial initiatives and enterprises within the Park;
- to have regard in performing its functions in relation to the Park, to priorities provided for in the Plan of Management or determined from time to time by the Board;
- to encourage as many relevant Aboriginal as is practicable to provide services in and in relation to the Park; and

-
- to regularly consult and liaise with the Northern Land Council and relevant Aboriginal associations in connection with the administration, management and control of the Park.

Joint Management and Traditional Protective Measures

The Kakadu Board of Management and Parks Australia jointly manage Kakadu National Park. The involvement and participation of the Aboriginal community in the joint management of Kakadu National Park is assured through the legislative framework, conditions of lease agreements with the traditional owners of Aboriginal land in the Park, the Plan of Management and the continuing day to day relationship between Parks Australia staff and Traditional Owners.

The EPBC Act provides for boards of management to be established for parks on Aboriginal land. The Kakadu Board of Management has an Aboriginal majority (ten out of fourteen members) representing Aboriginal Traditional Owners of land in the Park, and was established in July 1989. The *Bininj / Mungguy* (Traditional Owners / Aboriginal people) representation on the Board covers the geographic spread of Aboriginal peoples in the region, as well as the major language groupings. The Board is responsible for determining policy for the Park and, with the Director, for the preparation of plans of management for the Park.

The functions of the Board of Management are set out in the EPBC Act, and are as follows:

- to make decisions relating to the management of the Park which are consistent with the plan of management;
- in association with the Director of National Parks, prepare management plans;
- in association with the Director of National Parks, monitor management of the reserve;
- in association with the Director of National Parks; advise the Minister on all aspects of the future development of the Park.

The Board is also responsible for determining the overall allocation of resources in the Park and setting priorities to meet the prescriptions of the Plan of Management.

A central element of traditional culture is that *Bininj / Mungguy* exercise their cultural responsibilities for 'caring for country'. These are responsibilities with important obligations to past, current and future generations of Traditional Owners. Caring for country benefits the conservation value of the Park, maintains people-country connections, is important for the on-going maintenance of cultural traditions and supports the on-going well-being of the community of Traditional Owners.

Under the lease agreements for Aboriginal land in the Park, Parks Australia are required to:

- encourage the maintenance of Aboriginal tradition
- protect areas and things of significance to relevant Aboriginals
- integrate traditional skills of Aboriginal individuals and groups in managing the Park.

Management Planning

The EPBC Act requires the preparation of a Plan of Management for Kakadu National Park as a World Heritage area and Commonwealth Reserve. The Plan is to be prepared jointly by the Director of National Parks and the Kakadu Board of Management.

The Kakadu National Park Plan of Management 1998 is the fourth plan for the Park. The first Plan of Management was produced in 1981, with subsequent versions released in 1986 and 1991. It is the main policy document for the Park. The Plan describes how the Park will be managed, provides a number of management prescriptions, outlines general management principles, and increases the efficiency and consistency of decision-making for the Park. Consistent with the provisions of the EPBC Act, a review of the Plan is currently being undertaken by the Board of Management and the Director of National Parks.

The EPBC Act permits a management plan for a Commonwealth reserve to be in force for up to seven years, although a new plan may be brought into force before then. The current Plan of Management is due to expire in 2004, and the review has already commenced.

The EPBC Act includes the process for preparing management plans and considerations to be made in this process. This process provides that:

- the Director of National Parks must publish an invitation to comment on the proposal to prepare a draft plan;
- the Director of National Parks and the Board of Management prepare a draft plan, taking into account any comments received;
- an invitation to comment on the draft is issued;
- the Director of National Parks and the Board of Management must consider any comments received in relation to this invitation, and may alter the draft plan; and that
- if the Board of Management agrees, the Director of National Parks must give the Minister the plan for approval.

The Kakadu National Park Plan of Management can be accessed at:
<http://www.ea.gov.au/parks/publications/kakadu-html/index.html>

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Changes in Ownership and/or Legal Status

On 27 March 1991, the Director of National Parks and the Kakadu and Jabiluka Aboriginal Land Trusts signed revised lease agreements for Aboriginal land in the Park. 5 years later, on 31 January 1996, the Gunlom Aboriginal Land Trust and the Director of National Parks signed a memorandum of lease for managing the Jawoyn lands in the Park.

On 1 September 1997 a native title claim was lodged with the National Native Title Tribunal covering the township of Jabiru in Kakadu National Park. The claim was lodged by the Gundjehmi Aboriginal Corporation on behalf of the Mirrar people. The case is currently being heard in the Federal Court of Australia. Further information on Native Title issues can be accessed through the National Native Title Tribunal Internet site: www.nntt.gov.au.

Approximately half of the land in Kakadu National Park is Aboriginal land under the *Aboriginal Land Rights (Northern Territory) Act 1976* and is leased to the Director of National Parks. Most of the remaining land is currently subject to claims under the Land Rights Act. An alternative to the land claim process is for land to be 'scheduled' for grant under the Land Rights Act. The Northern Land Council has requested that this occur. Such a process would require an amendment to be made to the Act, and finalisation of leaseback arrangements. Parks Australia is currently liaising with the Northern Land Council about issues that would need to be resolved before the possibility of scheduling could be fully considered by Government.

Staffing, Financial and Training Resources

All Park staff are employed under the Commonwealth *Public Service Act 1922* with their general duties being to assist the Director in carrying out his or her functions under the Act. Parks Australia is committed to the principles of equal employment opportunity, follows the guidelines set out in the *Occupational Health and Safety (Commonwealth Employment) Act 1991*, and encourages workplace participation.

Officers of Parks Australia North manage Kakadu National Park on a day-to-day basis. The number of people working in the Park varies from time to time. At 30 June 2002, over 70 people were being employed, 41% of which comprised Aboriginal staff members.

The lease agreement for the Park requires the development and implementation of Aboriginal training programs in Kakadu. Parks Australia has put in place a number of key actions:

- recruitment of Traditional Owners in Park management positions ;
- employment of a training officer dedicated to indigenous staff training programs
- provision of continuing training in workplace skills including literacy and numeracy, law enforcement, using new technology in the workplace and tourism and public relations skills

-
- personal development programs for Aboriginal staff members to enable promotion to higher administrative and management positions;
 - provision of cross-cultural training programs for all Kakadu staff;

Parks Australia undertakes work in this area, and aims to monitor progress under the umbrella of an Indigenous Career Development and Recruitment Strategy. A set of indigenous land management skills have been identified for Kakadu and acknowledgement and recognition of these skills is being built into the Strategy. Recognition of these skills aims to ensure that indigenous as well as non-indigenous land management skills are recognised and valued in the workplace.

Recent initiatives in indigenous employment has included broadening the ways that local indigenous people participate in park management work – through job sharing and other more flexible working arrangements, contracting of work (rather than employment of staff) and providing for increasing leadership of land management projects by Traditional Owners.

Funds are provided each financial year for Kakadu National Park from the Commonwealth Government for the effective management of the Park and to fulfil the terms and conditions of the Lease and the Plan of Management. In the 2001-02 financial year, the Australian Government made an allocation of approximately \$9,616,809 specifically for Kakadu National Park operations and capital works.

Lease payments – including rental and a share of revenue generated from Park use fees and charges – are made to the Northern Land Council on behalf of the Land Trusts. The remaining revenue received from Park user fees and other income subsidises the Commonwealth Government's contribution to the Park.

Scientific and Technical Studies

Extensive research has been carried out in Kakadu National Park over the last thirty years by a range of Government bodies, including Parks Australia, the Supervising Scientist, CSIRO (Tropical Ecosystems Research Centre), as well as many tertiary institutions. The main themes for research include:

- cultural heritage
- fauna
- flora
- invasive species
- fire
- impact of mining

Research in Kakadu is permitted only after consultation with Aboriginal traditional owners and subject to conditions of a current permit. The Kakadu National Park Research Advisory Committee has been established to provide advice to the Director and the Board of Management about research in the Park and to assist with evaluation of research proposals. Uranium mining related research, conducted by the Supervising Scientist under the *Environment Protection (Alligator Rivers Region) Act 1978*, does not require a permit but must be carried out in accordance with the Plan of Management.

A bibliography of significant research and publications is provided in Appendix 1.

The Supervising Scientist for the Alligator Rivers Region independently monitors and carries out research to ensure the protection of the environment of Kakadu National Park from the potential impacts of uranium mining. The research programs of the Environmental Research Institute of the Supervising Scientist (ERISS) include:

- environmental radioactivity
- hydrological and ecological processes
- ecosystem protection and
- ecological risk assessment.

Further information on publications of the Supervising Scientist on research and scientific studies in the Alligators Rivers Region can be accessed at:

<http://www.ea.gov.au/ssd/publications/list.html>

Visitation

Due to the marked seasonality of the tropical north, visitation to Kakadu is highly seasonal, with most visitors coming in the dry season (May – September). Regular visitor statistics have been collated since the Park was established, with visitor surveys being undertaken in 1993 and 2000/01 to provide more information on visitor profiles, visitor activities, expectations and satisfaction with the Park visit. The most recent survey indicated that 51% of visitors come from overseas; the average stay in the Park is 2.6 days; and nearly 50% of visitors come to the Park through commercial tours.

The surveys show that visitors increasingly recognise Kakadu's World Heritage status, and more visitors visit the Park to appreciate its natural and cultural heritage. The table below shows the annual visitation to the Park, based on Park entry sales.

Year	Entry Ticket Sales
1992	128,355
1993	148,630
1994	161,947
1995	173,081
1996	171,068
1997	166,486
1998	170,094
1999	183,483
2000	167,611
2001	169,517

Education, Interpretation and Awareness Building

There are a number of facilities within the Park to enable visitors to appreciate its World Heritage values, including the two visitor centres, the Bowali Visitor Centre and the Warradjan Aboriginal Cultural Centre. There are also interpretation facilities for visitors at Mamukala Wetlands. Within the Park there are various lookouts and observation platforms, walking tracks (for both day walks and overnight bushwalking), four-wheel drive tracks and camping facilities. Interpretative displays and materials are provided throughout the Park and the World Heritage symbol is included on many interpretative materials, including interpretative panels and the Park entrance gates. All facilities within the Park are designed and built to a high standard to maintain the World Heritage values of the property.

Parks Australia has produced numerous publications to provide educational information on the values of Kakadu National Park, including guidebooks, Park Notes, maps and information pamphlets. Interpretive programs are provided to enhance the visitor experience of the Park. During the dry season, when most visitors come to Kakadu, rangers provide daily art site talks at Ubirr and Nourlangie art sites as well as other interpretive activities including guided walks and cultural activities with traditional owners, at selected sites.

There are a number of books and information resources (such as videos and compact disks) available, which have been produced on Kakadu National Park by the broader press. Environment Australia also publishes a Handbook for Tour Operators to provide information on the Park to tour operators who conduct tours in the Park. Parks Australia also provide information on the Internet, which can be accessed at: <http://www.ea.gov.au/parks/kakadu/index.html>.

The development of accommodation in the Park is permitted in accordance with prescriptions outlined in the Park's Plan of Management. Commercial motel-style is available in the Park at Cooina, Jabiru and adjacent to the South Alligator River on the Arnhem Highway. There is limited Youth Hostel style accommodation near the Border Store. Park staff for 25 designated camping areas in the Park, and bush-style camping is available outside of these areas, with a permit system in place to regulate the activity.

Responses to World Heritage Committee and Bureau State of Conservation Reports

The State Party has kept the World Heritage Committee well informed of issues relating to the World Heritage values of Kakadu National Park.

At the meeting of the Bureau of the World Heritage Committee in June 1998, it was decided that the Chair of the World Heritage Committee lead a Mission to Kakadu National Park to assess any ascertained or potential threats to the World Heritage values of the Park from the proposal to mine uranium at Jabiluka (the mineral lease area outside of the World Heritage Area). The Mission concluded that the natural and cultural values of Kakadu were seriously threatened by the development of the Jabiluka mine and recommended Kakadu National Park be placed on the List of World Heritage in Danger.

The Mission report was submitted to the World Heritage Bureau at its meeting in Kyoto, Japan in November 1998 and the report received endorsement from the Bureau. The report and the Bureau's recommendations were considered at the following meeting

of the World Heritage Committee. The Committee requested Australian authorities provide further information on their efforts to prevent further damage and mitigate threats identified within the UNESCO Mission report. It was also requested that the Australian authorities direct the Supervising Scientist to conduct a review of the scientific issues.

In response, in April 1999 the Australian Government presented a report, *Australia's Kakadu: Protecting World Heritage* providing detailed information confirming the protection of the World Heritage values of Kakadu National Park. This comprehensive report addressed a number of issues, including information on the environmental conditions to ensure that the Jabiluka uranium mine would not damage the natural and cultural values of the adjacent Kakadu National Park, and details on the range of social and economic measures being undertaken to assist all communities in the region. Every threat identified by the UNESCO Mission was analysed and each of the Mission's recommendations were responded to. *Australia's Kakadu: Protecting World Heritage* clearly demonstrated that the Australian Government had already been addressing the issues covered in the UNESCO Mission recommendations in the context of its ongoing management and protection of Kakadu.

In July 1999, *Australia's Kakadu: Protecting World Heritage* was considered by a special session of the World Heritage Committee. The Supervising Scientist also presented its report on the scientific issues at this meeting. The report of the Supervising Scientist concluded that, contrary to the views of the UNESCO Mission, the natural values of Kakadu National Park are not threatened by the development of the Jabiluka uranium mine. Given this conclusion, the World Heritage Committee decided not to include Kakadu on the List of World Heritage in Danger and requested a progress report in April 2000 from the Australian authorities.

In April 2000, Australia fulfilled this request, providing *Australia's Commitments: Protecting Kakadu – Progress Report to the Bureau of the World Heritage Committee* to the Bureau of the World Heritage Committee. This updated the progress made by the Australian Government in meeting the commitments made in *Australia's Kakadu: Protecting World Heritage*. The report was accepted by the Bureau in June 2000 and then forwarded for consideration of the World Heritage Committee at their November 2000 meeting in Cairns.

In July 2000, the Independent Science Panel (ISP) of the International Council of Science and the IUCN participated in a Mission to Kakadu National Park and the Jabiluka and Ranger Mineral Leases. The purpose of the Mission was to provide advice on science issues relating to Jabiluka mine. The overall conclusion of the ISP Mission was that the Supervising Scientist had identified all the principal risks to the natural values of the Kakadu World Heritage area that can presently be perceived to result from the approved Jabiluka Mill Alternative proposal. It also concluded that the analysis had shown the risks to be very small or negligible and that the development of the approved Jabiluka Mill Alternative should not threaten the natural World Heritage values of Kakadu National Park.

The report and recommendations of the ISP report, as well as the Australian Government response, were considered at the World Heritage Committee meeting in Cairns at the end of 2000. The Committee also took note of the advice from the IUCN,

who agreed with the advice of the ISP and Supervising Scientist, that the proposed mine did not threaten the World Heritage values of Kakadu National Park, stating that “IUCN is now satisfied that the currently approved site and mine do not threaten the biological and ecological systems of Kakadu.” At this session, the World Heritage Committee concluded that the currently approved proposal for the mine and mill at Jabiluka does not threaten the health of the people or the biological and ecological systems of Kakadu National Park.

It was reported in June 2001, to the World Heritage Bureau, that all commitments given to the World Heritage Committee in relation to Kakadu National Park were being implemented.

The Committee noted the various measures being undertaken to address this concern, including the Senate Inquiry to be held to examine issues relating to environmental regulatory, monitoring and reporting regimes at uranium operations within Australia. Dialogue between the State Party and the Traditional Owners of the mine area continues, and the State Party continues to regularly inform the World Heritage Centre on progress, reporting openly and transparently.

Internet links to reports from the State Party to the World Heritage Committee include:

1998 and 1999 State of Conservation Reports
<http://whc.unesco.org/nwhc/pages/doc/main.htm>

Response by the Government of Australia to the UNESCO World Heritage Committee regarding Kakadu National Park - April 1999
<http://www.ea.gov.au/ssd/uranium-mining/arr-mines/jabiluka/government-response.html>

Supervising Scientist Report to the World Heritage Committee
Assessment of the Jabiluka Project - Report of the Supervising Scientist to the World Heritage Committee 9 April 1999
<http://www.ea.gov.au/ssd/uranium-mining/arr-mines/jabiluka/ssd-report.html>

Australia's Commitments: Protecting Kakadu – Progress Report to the Bureau of the World Heritage Committee, 15 April 2000
<http://www.ea.gov.au/ssd/uranium-mining/arr-mines/jabiluka/progress-report.html>

Independent Science Panel of International Council of Science Union, Report Number 3, September 2000
<http://www.ea.gov.au/ssd/uranium-mining/arr-mines/isp-icsu3.html>

Identification of Gaps and Management Needs

Management needs and priorities for the Park are set out in the Kakadu National Park Plan of Management. A process for the development of the next plan of management (to be in place March 2004 through to 2011) has commenced. A key part of this process will be to identify current management issues and future needs for the upcoming seven year period.

A technical review of the current Plan of Management will be used to identify any current gaps. A process of consultation with Traditional Owners, other key groups and the public will be used to identify management needs and priorities for the Park. The Board of Management will also be closely involved in this process and in the putting together of the final plan.

Some important management issues and needs already identified include:

- the role of sustainable and appropriate tourism in Kakadu helping to secure better economic futures for the Aboriginal people of Kakadu;
- the need to examine current and projected tourism levels and to develop tourism futures and cultural tourism products that benefit the park;
- the management of intellectual and cultural property rights;
- enhancing the framework for monitoring of cultural values in Kakadu; and
- the on-going impacts of introduced feral weeds and animals and the development of effective programs to control them (for example, cane toads).

II.5. FACTORS AFFECTING THE PROPERTY

Development Pressure

The development pressures being addressed in Kakadu National Park primarily include the potential development pressure for the development of tourist infrastructure (refer to Visitor / Tourism Pressures section).

The landscape of Kakadu National Park is made up of very old landforms as well as new, dynamic landforms. These landforms naturally erode slowly, but this rate increases when the ground surface is disturbed. Some activities that increase erosion include road works and digging gravel; poorly designed tracks or roads that do not drain properly; clearing areas for visitor facilities; erosion from waves made by boats on small waterbodies; and feral animals breaking the soil surface. To assist in the management of these risks, some roads are closed in the wet season to protect the environment from vehicular damage, and weight and/or vehicle (including speed) limits, erosion-mitigating structures at bed-level stream crossings, have been applied to particular roads.

Rehabilitation arrangements have been developed for former mines in the South Alligator River Valley, known as the Gunlom Aboriginal Land Trust Area. A plan for rehabilitating old mine sites and associated workings in the Gunlom Land Trust Area has been drafted in conjunction with the Traditional Owners.

Environmental Pressure

Introduced and Feral Animals

Several kinds of feral animals are found in the Park, including Asian water buffalo, cattle, pigs, horses, donkeys, domestic dogs, cats, European bees and the cane toad. Large numbers of feral animals can adversely affect the integrity of native ecosystems. This risk is generally decreasing and is due primarily to external factors. The risk is being effectively managed through a variety of management responses, including:

-
- A feral animal management strategy is being developed (Kakadu Feral Animal Strategy) that takes into account the range of habitats in the Park and their differing sensitivities to disturbance. The strategy will also take into account the different views of clans of Traditional Owners about feral animal management on their lands. The strategy will determine how and at what levels feral animal populations will be controlled in different areas of the Park.
 - Traditional Owners will be closely consulted about developing and undertaking feral animal management programs on their land. Wherever practicable, enterprises conducted by relevant Aboriginals will be preferred in feral animal control programs.
 - Feral animal control programs will only be conducted by people authorised by the Park Manager and according to programs approved by the relevant Traditional Owners. Control programs will be conducted so as to minimise distress to the animals involved by persons who have undertaken an approved training course.
 - Preparations for the arrival of cane toads in Kakadu National Park began several years ago and include:
 - A preliminary risk assessment of the impact of cane toads in Kakadu (Supervising Scientist Report No. 164: refer to: <http://www.ea.gov.au/ssd/publications/ssr/164.html>);
 - Monitoring of the spread of toads through the Park and studies to measure the impact of toads on wildlife;
 - Public education initiatives;
 - Training and awareness raising of Park rangers, local community members, tour operators and local businesses; and
 - A frog-monitoring program that provides data on the impact of cane toads on vulnerable species. In addition Park staff conduct regular surveys and the public is requested to advise staff of any toad sightings.
 - With the exception of seeing eye dogs, visitors are not permitted to bring cats or dogs into the Park, and cats may not be kept within Jabiru.

Weeds

Weeds can threaten Park ecosystems, and effective strategies are required to ensure the number and area infested does not increase. Weeds that pose a threat within the Park include *Mimosa pigra*, *Salvinia molesta*, *Brachiaria mutica*, *Adropogon gayanus* and *Pennisetum polystachion*.

Significant resources have been allocated to control particular weed problems in the Park. Weed problems are approached within a regional context, as heavily infested areas outside the Park act as sources of seed for new infestations, and it is important that weeds from the Park are not spread to other areas. Parks Australia supports regional cooperation and consultation on weed management issues, and supports catchment management planning approaches. Park staff maintain close liaison with neighbours and other Government agencies and assists wherever possible with training, cooperative survey and control programs and with joint weed management planning.

A weed management strategy has been developed through extensive consultation with Aboriginal Traditional Owners, Park staff and weed experts. Weed management is based on integrated habitat management and intervening early to prevent new weed incursions.

Weed surveys in the Park are carried out on an ongoing basis and a database of occurrences of *Mimosa pigra* and other significant weed species is maintained. Actions to control and eradicate *Mimosa pigra* continue as required. The effectiveness of the current biological control agent for salvinia, the weevil *Cyrtobagous salviniae*, is being monitored. Park management has identified quarantine areas over a number of waterways to assist in the control of salvinia. Research into ways of controlling other high profile weeds such as para grass, calopo and mission grass as well as investigations into their effect on the environment continues. Using chemicals for controlling weeds is restricted as much as possible. Any proposals to use residual chemicals must be approved by the Park Manager and their risk is assessed.

Fire

For hundreds of generations, *Bininj/Mungguy* have used fire as an important way of managing and expressing ownership of country, however, Traditional Aboriginal ways of burning were greatly disrupted when Europeans occupied the land, and the fine mosaic of burnt and unburnt patches, which previously protected the area from damaging, hot fires, was lost. A number of species and communities are recognised as being sensitive to fire, and are therefore particularly threatened by frequent, intense fires. Other factors include the build-up of fuel, and the threat from fires outside the boundaries of the Park.

A number of activities are being undertaken in response to this issue:

- Since proclamation of the Park, management has tried to return to using fire more traditionally. *Bininj/Mungguy* are consulted closely about the development and implementation of fire management programs in the Park.
- Extensive research has been carried out on fire ecology and the impact of fire regimes on various habitats, ecosystems and animals.
- Further research and monitoring is being carried out to assess the ecological impact of different fire regimes, using fire to control major weed species and developing a more effective regional approach to fire management.
- Parks Australia maintains a stock of readily accessible fire-fighting equipment in all management districts and staff engaged in fire management are required to undergo fire-fighting training.
- A strategic burning program is carried out in the Park. This program takes into account the varying climatic conditions, vegetation types and structure, fuel loads and catchment areas. To prevent fire from entering the Park, boundary areas are burnt in the wet season or early dry season. This is carried out in close consultation with neighbours to the Park, and relevant Government agencies and Traditional Owners.
- Interpretation and education programs about fire management in Kakadu National Park focus on understanding the natural role fire plays within ecosystems in the Park, as well as traditional ways of burning and making sure people are aware of public safety issues.

Traditional Owners are taking charge of and conducting traditional burning in particular areas of the Park, with assistance from Parks Australia as required. The undertaking of these activities has made a positive contribution to the management of fire and biodiversity within the Park and is assisting the intergenerational transfer of traditional knowledge through action learning as family groups are involved. Work is continuing on the expansion of such cultural land-management programs.

Saltwater Intrusion

The wetlands of Kakadu National Park are amongst those that have been identified as being particularly susceptible to saltwater intrusion; a consequence of feral animal activities or future changes in climate and sea levels, which are being predicted. Saltwater intrusion leads to the conversion of freshwater paperbark (*Melaleuca*) swamps into extensions of the mangrove margin. Die-back of some *Melaleuca* has been observed in Kakadu's northern wetlands. Saltwater intrusion and/or altered fire regimes associated with weed invasions are possible contributory factors.

Ongoing research and long-term monitoring are required to address such changes in the overall context of landscape-level change. In 1996, ERISS published a vulnerability assessment of predicted climate change and sea level rise in the Alligator Rivers Region (Supervising Scientist Report No. 149). Also, since 1996, fixed, *in situ* monitoring sites have been established as a basis for detecting sea-level rise while remote sensing methodologies have been developed to detect and assess changes to *Melaleuca* distribution and abundance.

Continued monitoring and measuring of saltwater intrusion is occurring in the field. In addition, remote sensing techniques are being employed to map salinity substrates. These activities serve to measure recovery in wetland areas since the removal of buffalo and monitor for future possible intrusions relating to sea level rise.

Uranium Mining Issues

There are two mineral lease areas adjacent to, but outside of, the Kakadu National Park World Heritage Area. These areas have always been outside of the World Heritage Area. All mining activities are contained within the lease areas, however, there are a range of protective measures and monitoring programs in place to monitor and ensure the protection of the natural World Heritage values of Kakadu National Park. The Supervising Scientist has undertaken substantial independent scientific research in the region, which has shown that no harm from mining activities has been caused to the environment or to the health of the local Aboriginal people. (Further information on this issue can be found in Section II.6 – Monitoring.)

The Gunlom Aboriginal Land Trust (GLT) lease in the south of Kakadu National Park requires completion of a "plan of environmental rehabilitation" for Guratba (Coronation Hill) and other old uranium mine sites and associated workings within the Land Trust lease area, with best endeavours by Parks Australia to fully implement the agreed rehabilitation plan by 31 December 2015. Parks Australia, traditional Aboriginal owners and other stakeholders have spent a considerable effort over the last few years working towards the achievement of this legal commitment.

In late 2001 the Northern Land Council, traditional Aboriginal owners and Park Australia (with the support of other stakeholders including the Office of the Supervising Scientist, Australian Radiation Protection and Nuclear Safety Agency, and relevant NT Government departments) agreed to divide the project into Part A (sites with no or only minor radiological contamination) and Park B (those that have significant / complex radiological contamination).

Part A of the Plan will rehabilitate sites including the El Sherana Camp (but not the El Sherana containment), Slesbeek and Guratba (Coronation Hill) and Saddle Ridge East. Prior to work commencing a range of environmental approvals will be required, however liaison about these approvals has commenced with no major issues expected. Traditional Owners and the NLC have met and approved in principle Part A of the Plan.

Part B sites comprise the Gunlom residues site, El Sherana West, the three containments, and the core shed at El Sherana camp. A plan of rehabilitation of these sites cannot be completed until agreement between various stakeholders has been reached about the location of a residues containment facility, and other issues relating to its design and construction. Parks Australia is currently working with stakeholders to address these issues. The cost of designing and constructing a containment facility will be large, and is expected to be many millions of dollars.

The most significant site that will be addressed by Part B of the Plan is the 'Gunlom residues site', where Uranium mill residues from 1950's and 1960's mining operations were dumped. In November 2000, after these residues were exposed by natural processes, and an interim remediation program was completed. It involved the placement of armour rock, and the removal of small quantities of windrow material from next to the Gunlom Road. The material is now stored in drums, within shipping containers and a locked compound, not far from the site itself. In July 2002 ARPANSA and the OSS visited the Gunlom residues site and confirmed that the armour rock is in good condition, storage of residues is acceptable, and no additional works at this site are required this year

The Approvals and Legislative Division of EA and the Alligator Rivers Advisory Committee have been regularly briefed about the Gunlom projects. Both the NLC and ARPANSA have provided written commendation of work undertaken to date on the development of the GLT rehabilitation plan.

Visitor/Tourism Pressures

Kakadu National Park is a major tourist destination in the Northern Territory. As the number of visitors to the Park has grown, some sites are showing environmental impacts, and visitor experience can be reduced due to overcrowding. There is increasing pressure from tourism stakeholders to increase tourism access, promote growth in tourism and further develop tourism infrastructure and opportunities in the Park.

Traditional Owners have raised concerns about their ability to meet their responsibility to look after their country, particularly when tourism is growing rapidly at some sites which were not originally planned as high visitation sites. They are also concerned that increasing maintenance of tourism sites and attention to tourism issues draws park resources away from other land management function. As tourism grows, it demands more Park resources, including staff time. The Director of National Parks has legal responsibilities to ensure that tourism in Kakadu is managed in a way that protects the natural and cultural heritage of the Park and recognises the rights and interests of Traditional Owners. Visitor safety is another issue that escalates with increasing tourist numbers.

Balancing this Traditional Owners are exploring opportunities for tourism to provide economic benefit to them and their families.

The responsive management actions to this pressure include:

- Access to sites by tourists is managed in line with the Plan of Management and area plans. Area plans have been developed for various sites within the Park. Before making decisions about managing tourism in the Park, the Board and the Director consult in detail with Traditional Owners.
- A zoning scheme has been developed for the Park to regulate the level of access and use and identify management priorities for different areas of the Park.
- The Bowali Visitor Centre and the Warradjan Aboriginal Cultural Centre have been developed to provide additional information to visitors to the Park. The seasonal interpretation program and interpretation displays assist visitors to appreciate the natural and cultural heritage of the Park.
- Specific management programs are in place for road maintenance in areas used by visitors.
- Sensitive development of camping areas and designation of exclusive use areas for camping purposes. Permit system for camping outside designated areas.
- Permits are required for non-motorised recreational boating and restricted access to some areas of the Park. Recreational boating activities and other activities such as parasailing, jet skis, air boats & hovercrafts and scuba diving are prohibited in the Park.
- Restrictions have been placed on mountain bike riding, abseiling, rock climbing, shooting, archery, hovercrafts, airboats, and recreational horse riding.
- Specific limits or restrictions have been placed on some commercial tour opportunities.
- Information signs, brochures and displays, and contact with Park staff to inform visitors about the risks in visiting the Park. When necessary, areas are closed where public safety would be endangered.
- Visitor facilities, including visitors' centres, viewing areas, roads, picnic areas and walking tracks, are designed and built to a high standard consistent with the World Heritage status of Kakadu and to protect the natural and cultural environment of the Park.

Other Pressures

Control of cultural heritage by Bininj/Mungguy

In the past, day to day work plans for managing cultural heritage in the Park has been developed mainly by Parks staff, in consultation with Traditional Owners on specific projects. *Bininj/Mungguy* have been concerned that they have not been able to lead or control the management of their cultural heritage as much as they would like.

Under the previous Plan of Management a Memorandum of Understanding Regarding the Control of Aboriginal Cultural Material in Kakadu National Park was established. The MoU establishes the Bining Heritage Management Committee that acts on the advice of traditional owners and provides feedback to the wider *Bininj/Mungguy* community.

Protecting areas of Aboriginal significance

Traditional Owners are concerned that, according to Aboriginal tradition, the ‘wrong people’ may be entering sites of significance. In response to this issue, Parks Australia has established a register of significant sites that identifies sensitive areas and documents the wishes of Traditional Owners in relation to these sites. Traditional Owners guide any actions carried out on significant sites. Also, where appropriate, the significance of sites are interpreted for visitors through signs and brochures. Significant sites and bushwalking routes are patrolled regularly by Parks staff and checked by Traditional Owners. To further help manage this pressure, Sickness Country (in the south of the Park) is managed in line with protocols established under the terms of the lease agreement with the Gunlom Aboriginal Land Trust.

Damage to Rock Art and other Archaeological Sites

The most serious physical damage to rock art comes from water flowing over the rock and removing pigment, and water depositing salts and minerals on the painted surfaces. Other damaging agents include vegetation, mud-building wasps, termites, feral animals, humans and wildfire.

The following management responses have been undertaken by Parks Australia to assist in addressing this issue:

- Conservation work includes installing silicone driplines, removing wasp nests from artwork, removing damaging vegetation, fencing some sites to prevent damage from feral animals and removing graffiti.
- Long term conservation of fragile paintings may require further research into the chemical composition of pigments and how they interact with rock surfaces and minerals salts. This may contribute to ways to stop paintings from deteriorating.
- Any further visitor access to rock art or other archaeological sites will be strictly controlled by Traditional Owners through the Bining Heritage Management Committee, and may involve restricted access arrangements.
- Walking tracks and boardwalks have been provided at Burrungui (Nourlangie Rock), Naguluwur and Ubirr to enable visitors to view the rock art while protecting sites from damage.
- Park staff are present each day at Burrungui and Ubirr during peak periods to provide ranger talks.
- Location and features of sites are being recorded in a database as a part of a long-term site recording and survey program of rock art.
- An art site maintenance team carries out day-to-day management of rock art sites.
- Development proposals for the Park are assessed to ensure that there is no negative impact on any rock art or other archaeological sites.

Loss of Oral Cultural Heritage

Aboriginal Traditional Owners of Kakadu have detailed knowledge of the flora, fauna, habitats, seasonal changes, landscapes, places and history of Kakadu and religious beliefs regarding the creation era. This immense body of knowledge is the oral cultural heritage of Kakadu. It is also a fragile resource, as people who have important traditional knowledge age and pass away. It is becoming increasingly urgent to record this knowledge so that future generations of *Bininj/Mungguy* can benefit and so that the Park can continue to be managed in an informed way. *Bininj/Mungguy* have stressed that they need to be in control of programs to manage Aboriginal oral cultural heritage in the Park to address issues of appropriate access and storage. The inter-generational

transfer of knowledge has also been acknowledged as a key issue in the maintenance and preservation of traditional knowledge and culture.

Acknowledging the importance of this issue, Parks Australia have developed a range of management responses, such as:

- provision of logistical support to ceremonies and traditional cultural activities carried out of Traditional Owners;
- recording and documenting Aboriginal languages of the area ;
- recording of Aboriginal knowledge of flora and fauna, perspectives of the landscape, traditional ways of managing resources, place names, religious stories, background to historical events, recollections of the interaction between Europeans and *Bininj/Mungguy*, as well as personal histories;
- the current Plan of Management gives a high priority to the recording of oral cultural heritage;
- a Bining Heritage Management Committee determines use and access to cultural material and sets priorities for it collection. To encourage maintaining traditional skills, oral cultural material is recorded ‘on country’ as much as possible;
- Parks Australia archiving existing oral cultural heritage materials in a stable format and providing suitable storage areas and a register of materials.

Another response to help protect Kakadu National Park’s cultural values is the Indigenous Heritage Education Project at Jabiru Area School. A joint initiative between the Northern Territory and Commonwealth Governments, the aim of the Project are to improve the learning outcomes of Indigenous students in the Kakadu region. The project will also increase the educational access of children of Traditional Owners and/or children speaking local languages, and support and maintain the cultural heritage traditions of the Indigenous people in the Kakadu region.

II.6. MONITORING

Current Monitoring Program

Current monitoring within the Park is designed and employed to assess major threats to the World Heritage values of the Park and include suitable indicators for this assessment. The monitoring programs are designed and implemented from advice received from the Kakadu Research Advisory Committee.

Monitoring of Cultural Issues

Kakadu National Park is inscribed on the World Heritage List for its cultural and natural values. Monitoring the maintenance of the cultural values is undertaken by through a number of different methods.

The 1997 Kakadu Region Social Impact Study (KRSIS) addressed community development and social impact issues within the Kakadu Region. This included issues relating to education, economic development, employment, training, housing, infrastructure, health and culture. The KRSIS Aboriginal Project Committee also undertook research into social issues relating to Uranium mining in the Kakadu region.

A KRSIS Implementation Team was established to oversee and monitor responses to the recommendations of the KRSIS Community Action Plan. These recommendations dealt with a range of issues, including social conditions (such as education and health), communication, economic development and recognition and empowerment.

In addition to government responses to the KRSIS report community initiatives efforts have also been directed towards a number of projects in housing, infrastructure, employment, training, education, health, sport, recreation, women's issues, ceremonies, and sustained economic development.

These projects have all contributed to significant progress in addressing issues identified in the 1997 KRSIS report.

Monitoring of Uranium Mining Activities

The Office of the Supervising Scientist was established under the *Environment Protection (Alligator Rivers Region) Act 1978*. The stated primary role of the Supervising Scientist, as prescribed by this Act, is to “ensure, through research, assessment and the provision of technical advice, that the environment of the Alligator Rivers Region is protected from the effects of uranium mining to the very high standard required by Commonwealth Government and the Australian people.”

The Environmental Research Institute of the Supervising Scientist (ERISS) carries out research and monitoring of uranium mining activities in addition to monitoring carried out by the Northern Territory Department of Business, Industry and Resource Development and the mining company. The research and monitoring activities of ERISS focus more specifically on off-site aquatic impacts to ensure protection of Kakadu's streams and wetlands. A formal environmental monitoring program was instigated in 2001 and entails water chemistry and biological monitoring, as well as laboratory ecotoxicity assessment. Biological monitoring focuses on measurement of benthic macroinvertebrate and fish communities in streams potentially affected, as well as unaffected, by mining (or potential mining) at Ranger and Jabiluka. In addition, an environmental radioactivity program with associated monitoring, including analysis of Aboriginal bush foods, is conducted to ensure the protection of humans from possible contamination arising from radiation.

The Independent Science Panel (ISP) of the International Council of Science and IUCN, acting on behalf of the World Heritage Committee (WHC), reviewed all the principle risks to the natural values of the Kakadu World Heritage site arising from the approval of the Jabiluka mill alternative proposal. It concluded that impacts from the Jabiluka proposal were most likely very small or negligible. Nevertheless, the ISP recommended a more comprehensive risk assessment of both the freshwater and terrestrial ecosystem at a landscape-catchment scale. It also recommended comprehensive monitoring programs with accompanying analyses (assessments) to distinguish mining impacts from changes caused by other human activities. The ISP recommended that baseline inventory, assessment and associated monitoring run for several years before mining starts. The ISP review recommended that ERISS and Parks Australia undertake inventory, assessment and monitoring activities on the Park at landscape scales in order to guide ecosystem management well into the future.

The site-level environmental monitoring program described above was partly instigated on the recommendations of the ISP. In addition, in response to the recommendations of the ISP and Kakadu Research Advisory Committee, ERISS is producing a tiered (top-down) hierarchical landscape approach to inventory, from mapping of river basins, to wetland regions, to wetland complexes, to wetlands habitats. At present such mapping is being restricted to ecosystems and habitats in proximity to the Ranger and Jabiluka mine sites. The inventory data gathered under this hierarchical scheme will assist the Supervising Scientist, as well as provide important information to Parks Australia North, as managers of Kakadu National Park.

Foremost, and through continued monitoring, the mapping will provide:

- a basis upon which to distinguish mining from non-mining-related impacts in the relevant catchments;
- direct measurement of possible adverse changes to higher-order landforms, many of which are listed under the World Heritage values of Kakadu National Park;
- improved context upon which to assess human-related disturbances in the Region – such as could lead to (re-)prioritising resources for management, including control; and
- through mapping and stratification of habitats etc, an improved basis upon which to plan and conduct site-level inventories.

The Supervising Scientist's mining-related programs are responsible for most of what is known about the aquatic ecosystems of Kakadu National Park. Because the site-level monitoring programs also include catchments and sites in the Park unaffected by mining activities, they also have the potential to detect and assess impacts associated with other (non-mining-related) threats to aquatic ecosystems in the Park. Relevant baseline data in the Park is extensive, dating back to the early 1970s, and relevant to the South and East Alligator rivers and their tributaries. The focus of this work was mainly aquatic and semi-aquatic systems and organisms, as aquatic ecosystems had been identified as those potentially at risk from mining operations in the Alligator Rivers Region. The baseline data was gathered as part of fact-finding studies, Government consultancies, including taxonomic studies, and environmental impact statements. A summary of the baseline information gathered for the Alligator Rivers Region on algae, vascular plants, microinvertebrates, macroinvertebrates, fish, amphibians, reptiles, birds, mammals and alien species is provided in Humphrey and Dostine (1994), Gardner et al (2002) and Johnston and Milnes (2002).

For 23 years, the Supervising Scientist has been reporting and monitoring the mining leases, and over this period of time, he has been able to report that at no time have mining activities at Ranger or Jabiluka adversely affected streams and wetlands of Kakadu National Park.

Apart from research activities associated with mining, ERISS is also a partner of the National Centre for Tropical Wetland Research (NCTWR), a consortium (comprising of ERISS, Northern Territory University, University of Western Australia and James Cook University) that, in part, conducts general research that may assist in the sustainable use and management of tropical wetlands. NCTWR activities that have assisted Park managers include climate change vulnerability assessment, risk assessments of weeds and their chemical control, as well as assessment of cane toad invasion and impacts. Information about the NCTWR is available at: <http://www.nctwr.org.au>.

Results of Current Monitoring Program and of Key Indicator Measurement

The Monitoring Matrix (below) outlines the current monitoring program in place for the Park. The program has evolved since the Park was first inscribed in the World Heritage List. The program was originally district based, monitoring broad environmental changes, including vegetation changes and effects from fire management. This was primarily through photographic site monitoring.

The current program is more sophisticated, examining the range of natural and cultural values across the Park, undertaken by Parks Australia and ERISS. The program has identified broad changes within the Park, identifying significant management issues. This includes highlighting the improvements gained through the mimosa program, as well as assisting in projected future changes, such as the risk assessment of cane toads within the Park.

The monitoring program currently operating in the Park has not been formally documented as it relates to World Heritage values. A framework for the monitoring of such values – natural and cultural – is being developed.

Some trends have been identified from current monitoring activities, such as an apparent decline in some species of mammal and the rapid expansion of crocodile populations. Overall, the natural values of the Park are in good condition. With regard to feral flora, the identified issues of *Mimosa* and *Salvinia* are under control, with biological and other control methods proving effective in reducing population growth and spread.

World Heritage Values Monitoring – Monitoring Matrix

The following table is a summary of recently completed and current research and monitoring projects being undertaken in Kakadu National Park. Refer to Section II.2 Statement of Significance for a more comprehensive description of World Heritage values (Indicative World Heritage Values Table) and Section II.5 Factors Affecting the Property for a description of pressures.

World Heritage Value	World Heritage criteria	Pressures (including potential pressures)	Title and Purpose of project
Diversity of animal species, including endemics or endangered or species restricted in distribution	Natural criteria (ii), (iv)	<ul style="list-style-type: none">• Inappropriate fire regimes• Feral and exotic animals• Weed spread• Exotic diseases	Terrestrial Fauna Surveys Investigate historical changes in terrestrial fauna (small mammals, birds, some reptiles) especially in relation to fire history. The surveys will also provide data to allow assessment of cane toad impacts and collect baseline data on occurrence of exotic diseases (leptospirosis) and animals. Frog species abundance

World Heritage Value	World Heritage criteria	Pressures (including potential pressures)	Title and Purpose of project
			<p>Record relative abundance of frog species (based on number of calls per unit time) pre and post cane toad invasion at specific sites.</p> <p>Ecology of tree-dwelling goannas Study habitat use, diet and territorial behaviour of two species of tree dwelling goannas, <i>Varanus scalaris</i>, <i>Varanus tristis</i>.</p> <p>Quoll survey Study of the impacts of cane toads on survival and densities of marsupial quolls (<i>Dasyurus hallucatus</i>).</p> <p>Aquatic fauna surveys Extensive and intensive surveys and monitoring of lowland wetlands and streams have been/are being conducted by ERISS mainly as part of its mining remit.</p> <p>Crocodile monitoring Annual surveys of crocodile numbers on major waterways in the Park.</p> <p>Marine turtle monitoring Annual counts of flat-back turtles (<i>Natator depressus</i>).</p> <p>Fish monitoring Bi-annual estuarine fish surveys to assess species and population trends; bi-annual surveys of barramundi populations to detect any change from recreational fishing</p> <p>Monitoring lead shot impacts on magpie geese Establishing baseline data on levels of lead shot poisoning in magpie geese.</p> <p>Waterbird monitoring Proposed project to follow on from baseline data collected aerial surveys of geese and other waterfowl conducted in 1980's and 1990's.</p> <p>Leichardt's grasshopper Study of the ecology of Leichardt's Grasshopper and sandstone heath communities of Kakadu in relation to fire.</p>

World Heritage Value	World Heritage criteria	Pressures (including potential pressures)	Title and Purpose of project
Diversity of plant species, including endemics, or endangered species, and species restricted in distribution	Natural criteria (ii), (iv)	<ul style="list-style-type: none"> • Weeds • Inappropriate fire regimes 	<p>Fire scar Mapping and Fire Plot Monitoring Examination of long term changes in vegetation in selected plots through mapping annual distribution of fires, and monitoring matrix of fire plots biannually for fire occurrence and every 5th year for vegetation changes.</p> <p>Mimosa monitoring Location and eradication of mimosa and on going assessment of success of control measures.</p> <p>Salvinia monitoring On-going biological treatment of infestations of <i>Salvinia molesta</i> and assessment of status of waterbodies.</p>
On-going geological processes	Natural criterion (ii)	<ul style="list-style-type: none"> • Saltwater intrusion 	<p>Mapping and monitoring saltwater intrusion (Proposed project) Mapping of historical saltwater intrusion mitigation works and identify locations where saltwater intrusion is likely to occur in the future.</p> <p>Long-term change in mangrove forest distribution Using remote sensing data (aerial photography and satellite imagery) to examine changes in the distribution of coastal mangrove forests.</p>
Large areas of contiguous, diverse landscapes and habitat types, and related on-going evolutionary processes	Natural criteria (ii), (iv)	<ul style="list-style-type: none"> • Feral animal activity • Inappropriate fire regimes 	<p>Long term landscape scale change in Kakadu Using aerial photography to examine long term landscape level changes in habitat boundaries</p> <p>Monitoring riparian forests –Ground based surveys to assess the recruitment success of important fruit trees in forests disturbed by weeds, feral animals and/or fire.</p> <p>Feral animal project Implementation of Feral Animal Strategy to identify most appropriate methods of managing feral animals, and establishment of pig-impact monitoring program.</p>
On-going management of landscapes by	Natural criterion (ii)	<ul style="list-style-type: none"> • Factors inhibiting spending time on country and 	<p>Fire management activities undertaken by Aboriginal people On-going consultation with Traditional</p>

World Heritage Value	World Heritage criteria	Pressures (including potential pressures)	Title and Purpose of project
Aboriginal people through use of fire		passing on of knowledge of fire management practices	Owners regarding fire regimes and involvement of Aboriginal people in burning programs; assistance in re-establishment of fire management programs to be conducted by Aboriginal people. Trialing model programs where traditional owners take a lead role in planning and implementing fire management programs, twinning this with cultural heritage 'action learning'
Art sites of great antiquity and diversity demonstrating a continuous living cultural tradition and an outstanding example of people's interaction with the natural environment	Cultural criteria (i), (vi) ; Natural criterion (ii)	<ul style="list-style-type: none"> • Feral animals • Visitors • Weathering • Fire • Factors inhibiting spending time on country and passing on of knowledge 	<p>Art site monitoring program Monthly inspection and maintenance of all art sites open to the public and others at the request of Traditional Owners; annual surveillance of sites along bushwalking routes. Monitoring and protection of high value archaeological sites.</p> <p>Oral history project On-going program to record oral histories with Traditional Owners; establishment of multi-media program for improved storage and access of cultural information.</p>

II.7. CONCLUSIONS AND RECOMMENDED ACTION

a. Main conclusions regarding the state of the World Heritage values of the property (see items II.2. and II.3. above)

The natural and cultural values for which Kakadu National Park was inscribed into the World Heritage List are being maintained. The Park is large, diverse and ecologically intact. It contains a variety of habitats and vegetation types, including extensive and relatively unmodified vegetation cover and largely intact faunal composition. The number of alien plants and animals remains quite low. Active management is undertaken within some areas of the Park to maintain its good condition and to ensure its long-term integrity of the cultural and natural heritage. Also, the surrounding areas provide a good buffer against external, potential adverse, influences.

Kakadu National Park reflects an outstanding example of a landscape that has evolved in company with continuing Aboriginal occupation and 50,000 years of a hunting and gathering culture. Traditional beliefs and practices remain important in the daily life of Aboriginal communities and rites and ceremonies continue to be practiced. The Park contains one of the greatest concentrations of rock art in the world, most of which are in

a good state of preservation. The state of preservation of ceremonial sites with cultural remains, such as stone and bone arrangements does vary, with bone arrangements being affected by natural weathering processes and stone arrangements generally remaining in excellent condition.

b. Main conclusions regarding the management and factors affecting the property (see Items II.4 and II.5. above)

The management regime for Kakadu National Park is supported by the Commonwealth Environment and Heritage legislative framework. This framework establishes the joint management arrangements for the Park between the Director of National Parks and the Kakadu Board of Management. The conditions of the lease, the Kakadu Plan of Management and other management arrangements complement this framework. Approximately 50% of the land in the Park is Aboriginal land, with title to Aboriginal land being held by Aboriginal land trusts.

Extensive research has been undertaken within Kakadu National Park, including research into the factors which may affect the property, which include introduced and feral animals, fire management, weeds, saltwater intrusion, visitor and tourism pressures. Management responses have been developed and initiated in response to these issues. Research into cultural issues has also been undertaken, examining potential pressures to the Park such as, control of cultural heritage, protection of areas of Aboriginal significance, damage to rock art and archaeological sites, and the loss of oral cultural heritage in the Park. Management responses have also been developed to address these issues to ensure the continued protection of the cultural and natural values of the Park. Development of a Park performance management framework and on-going monitoring of Park values assists with on-going review and improvement of management programs.

Legislation is in place to ensure that the uranium mining activities which take place outside of the Kakadu National Park World Heritage area are strictly regulated. The Supervising Scientist independently monitors and carries out research to ensure the protection of the environment of Kakadu National Park and after 23 years of reporting and monitoring on the mining leases, the Supervising Scientist is able to report that at no time have mining activities at either the Ranger or Jabiluka mining areas adversely affected the streams and wetlands of Kakadu National Park.

c. Proposed future action/actions

A review of the current Plan of Management for the Park is underway, following the statutory process for the review of management plans, as established within the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Work will also continue on monitoring tasks within the Park under an enhanced monitoring framework.

The Australian Government continues to emphasise the need for consultation with Traditional Owners before a decision is made on any possible nomination of Kakadu National Park, the greater Kakadu Region or Kakadu National Park and the East Alligator River catchment as a World Heritage cultural landscape.

d. Responsible implementing agency/agencies

The Director of National Parks, together with Parks Australia and the Board of Management will be responsible for leading the Plan of Management review process.

e. Timeframe for implementation

It is anticipated that the new Plan of Management will come into effect in 2003.

Kakadu National Park
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