IUCN Conservation Outlook Assessment 2014 **(archived)**
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Please note: this is an archived Conservation Outlook Assessment for Kakadu National Park. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Kakadu National Park

SITE INFORMATION

Country:
Australia
Inscribed in: 1992
Criteria:
(i) (vi) (vii) (ix) (x)

Site description:
This unique archaeological and ethnological reserve, located in the Northern Territory, has been inhabited continuously for more than 40,000 years. The cave paintings, rock carvings and archaeological sites record the skills and way of life of the region’s inhabitants, from the hunter-gatherers of prehistoric times to the Aboriginal people still living there. It is a unique example of a complex of ecosystems, including tidal flats, floodplains, lowlands and plateaux, and provides a habitat for a wide range of rare or endemic species of plants and animals. © UNESCO

SUMMARY

2014 Conservation Outlook

Significant concern

This large and extremely spectacular biodiversity-rich property faces a great number of challenges, in part known thanks to the great amount of research and monitoring that has been undertaken in the site. An important documented decline in many species of small mammals as well as some birds and other species, the unfortunate recent introduction of Cane Toads, and the existence of a uranium mine in an enclave of the property are negative factors which will take time to remedy. Positive developments include the relinquishing of one mining lease-hold and incorporation of this area within the property, and the successful management of invasive species such as Mimosa and some feral animals. While positive and negative elements could balance each other out, given the unknown effects of climate change (effects of which seem already to have started to be experienced), and despite excellent state-of-the-art management and protection, the conservation outlook for this outstanding property has been determined to be Significant Concern.

Current state and trend of VALUES

High Concern
Trend: Stable

Despite the large size and strong management of the property, a significant decline in small mammals, some birds and possibly other species has been observed since inscription. The problem is complex with potential causes including disease, predation and over-grazing by feral animals, and uncontrolled wildfire (or a combination of these). The introduction of Cane Toads to the park in 2001 is a negative development, as has been the Ranger uranium mine which operates in an enclave within the property and impacts on scenic values and integrity. On the other hand, vast areas of the property are still in excellent condition and park management is dealing with all these challenges. However, until deteriorating trends to the current state of World Heritage values are

reversed, the situation has been assessed as of High Concern.

Overall THREATS

High Threat

Current threats include predation and habitat damage by alien plants and animals, and uncontrolled wildfire, which at times act synergistically to increase the damage caused to WH values. Increased tourism acts as a driver for these threats. Potential threats include climate change which could have catastrophic results, for instance sea level rise could destroy the entire floodplain area. Risks of radioactive pollution or the introduction of new diseases, pathogens or alien species are also possible, and are being dealt with by excellent management and risk-preparedness plans, as well as research and monitoring. However, deterioration in some WH values has been documented, thus despite excellent management the threats to the property remain of concern.

Overall PROTECTION and MANAGEMENT

Highly Effective

Protection and management in Kakadu is highly effective with excellent management plans and qualified staff; investment in research and monitoring, however, could be improved. Possibly due to factors beyond management control some biodiversity values in the park are declining, and monitoring and research to assess, understand and reverse this trend is under way. Some conflicting park objectives, such as biodiversity and cultural management, might reduce the effectiveness of biodiversity conservation efforts. There are also some tensions between management and land owners. However, in general the management response to a wide range of challenges is highly effective.

FULL ASSESSMENT

Description of values

Values

World Heritage values

- **Great natural beauty and sweeping landscapes**
  Criterion:(vii)

  Kakadu National Park contains a remarkable contrast of landscapes from mangrove-fringed tidal plains in the north to vast floodplains, lowland hills and the sandstone cliffs of the Arnhem Land escarpment. The escarpment consists of vertical and stepped cliff faces up to 330 metres high and extends in a jagged and unbroken line for hundreds of kilometres. The plateau areas behind the escarpment are inaccessible by vehicle and contain large areas with no human infrastructure and limited public access. The views from the plateau are breathtaking (SoOUV, 2013).

- **Vast congregations of migratory waterbirds**
  Criterion:(vii)

  The vast expanse of internationally important wetlands to the north of the park extend over tens of kilometres and provides habitat for millions of migratory waterbirds during the dry season, peaking from August to October (IUCN, 1981, 1992; Nomination, 1991; SoOUV, 2013).

- **Large and relatively intact landscape allowing continued evolutionary processes**
  Criterion:(ix)

  The property incorporates significant elements of four major river systems of tropical Australia. Kakadu’s ancient escarpment and stone country span more

than two billion years of geological history, whereas the floodplains are recent, dynamic environments, shaped by changing sea levels and big floods every wet season. These floodplains illustrate the ecological and geomorphological effects that have accompanied Holocene climate change and sea level rise.The Kakadu region has had relatively little impact from European settlement, in comparison with much of the Australian continent. With extensive and relatively unmodified natural vegetation and largely intact faunal composition, the park provides a unique opportunity to investigate large-scale evolutionary processes in a relatively intact landscape (SoOUV, 2013).

► Conservation of significant habitats

Criterion:(x)

The park is unique in protecting almost the entire catchment of a large tropical river, conserving one of the widest range of significant habitats in tropical northern Australia (SoOUV, 2013). Several important plant associations are restricted to the park, including those associated with Eucalyptus koolpinensis, the heath vegetation on the margins of the Marrawal Plateau, and woodland containing Terminalia platyptera on Snake Plains (Nomination, 1991).

► Threatened, endemic and relict plants

Criterion:(x)

Floristically Kakadu is the most diverse and most natural area of northern Australia with more than 1,600 species recorded from the park, including 46 species of plants considered rare or threatened and nine restricted to the park (Nomination, 1991; IUCN, 1992). By 2007 it was noted that over 50 species of threatened plant species occur in the park, 40 of which have been listed by national consensus as having special significance (DNP, 2007).

► Threatened, endemic and relict mammals

Criterion:(x)

The property contains one quarter of Australia’s land mammals with more than 64 species (77, DNP, 2007) of mammals recorded from the property. Calaby's mouse (Pseudomys calabyi) and the Kakadu Dunnart (Sminthopsis bindi) are either restricted to or have much of their known population within

the confines of the Park. Other significant species cited were: Nabarlek (Petrogale concinna); Ghost bat (Macroderma gigas); Brush-tailed phascogale (Phascogale tapoatafa); Red-cheeked Dunnart (Sminthopsis virginiae); and Northern Brushtail Possum (Trichosurus arnhemensis). Marine and coastal habitat supports a substantial Dugong (Dugong dugong) population (Nomination, 1991; IUCN, 1992). Additional endemic and threatened mammal species including Northern Quoll (Dasyurus hallucatus); Golden Bandicoot (Isoodon auratus); Brush-tailed Rabbit Rat (Conilurus penicillatus); Golden-backed Tree Rat (Mesembriomys macrurus); False Water-rat (Xeromys myoides); and Arnhem Land Rock-rat (Zyzomys maini) were added in 2007 (DNP, 2007).

► Threatened, endemic and relict birds

Criterion:(x)

Over one third of Australia’s bird species (275) have been recorded from the property (IUCN, 1992). Birds whose survival depends in part on the protection of the Park include the subspecies of Banded Fruit Dove (Ptilinopus cinctus) endemic to the Arnhem Land sandstone massifl; Red Goshawk (Erythrotriorchis (=Accipiter) radiatus); Hooded Parrot (Psephotus dissimilis) and Gouldian Finch (Erythrura gouldiae). Also worthy of note are the White-throated Grass Wren (Amytomis woodwardi), the Partridge Pigeon (Geophaps (=Petrophassa) s. smithii) and the Rufous Owl (Ninox rufa) (IUCN, 1981; Nomination, 1991).

► Threatened, endemic and relict frogs

Criterion:(x)

More than 25 (27, DNP, 2007) species of frogs have been recorded from the property (IUCN, 1992). Most notable is the uncommon and large Carpenter frog (Megistolotis lignarius), which is restricted to sandstone escarpment areas between western Amhem Land and the Kimberleys. Other rock-dwelling endemics of this area are Copland's rock frog (Litoria coplandi), Rockhole Frog (L. meiriana), and the rarely seen Masked Frog (L. personata) (Nomination, 1991).

► Threatened and endemic reptiles

Criterion:(x)

The reptile fauna comprises two crocodile species, seven species of freshwater turtle, three species of sea turtle, 77 lizard species (15 species of gecko, four legless lizards, 10 dragons, 11 monitors and 37 species of skink and 39 species of snake (Nomination, 1991). Most important breeding habitat in the world for the Saltwater Crocodile (Crocodylus porosus) and the Pig-nosed turtle (Carettochelys insculpta). Marine and coastal habitat supports substantial turtle populations (IUCN, 1981, 1992).

► Threatened, endemic and relict fish

Criterion:(x)

Fifty-nine fish species, 12 of them essentially marine, are recorded from freshwater locations in the park. This represents approximately one-third (25% IUCN, 1992) of all fish species found in Australian freshwater habitats (Nomination, 1991). Kakadu contains a significant portion of the total range for the Exquisite Rainbowfish (Melanotaenia exquisita), Mariana's or the Magela Hardyhead (Craterocephalus marianae) , the Sharp-nosed Grunter (Syncomistes butleri) and Midgley's Grunter (Pingalla midgleyi) (Nomination, 1991). Over 246 tidal and freshwater species have been recorded in the park (DNP, 2007).

► Threatened and endemic invertebrates

Criterion:(x)

It has been estimated that Kakadu contains more than 10,000 and possibly up to 100,000 insect species but only a small proportion have been described scientifically and few investigated. (Nomination, 1991). Numerous groups cited including 55 species of termite and 200 species of ants (10% of the total world number) (IUCN, 1992).

Assessment information

Threats

Current Threats

High Threat

Current threats include predation and habitat damage by alien plants and animals, and uncontrolled wildfire, which at times act synergistically to increase the damage caused to WH values. Increased tourism acts as a driver for these threats.

▶ Invasive Non-Native/ Alien Species

High Threat
Inside site
Outside site

Kakadu is said to be “one of the most weed free conservation areas in Australia” with “only a small number of weeds found in the park are considered invasive”, listing the three worst as Mimosa Mimosa pigra; Salvinia Salvinia molesta; and Para Grass Brachiaria mutica which are carefully controlled due to their potential to spread over large areas (Cook et al., 1996). Other invasives include Mission Grass Pennisetum polystachion; Gamba Grass Andropogon gayanis; Candle Bush Senna alata; Calopo Calopogonium mucunoides; Gambia Pea Crotalaria goreensis; Golden Shower Cassia fistula; Poinciana Delonix regia and Coffee Bush Leucaena leucocephala (http://www.environment.gov.au/parks/kakadu/management/programs/weeds.html). Additional invasive plants which have been managed include Pennisetum Pennisetum pedicillatum; Bellyache Bush Jatropha gossypifolia, Wild Cotton Gossypium sp. and Rubber Bush Calotropis procera (http://www.environorth.org.au/windows/dk/dk_weeds_conservation.html, Cowie & Werner, 1987; Storrs, 1996). Progress has been made with monitoring and control programs with, for example, only one new plant of Mimosa found in 2011-2012 (DNP, 2012). Management is said to be effective with significant resources committed to priority weed management programmes. However, there is a high potential for weeds to enter Kakadu from Arnhem Land and adjoining pastoral properties on the western boundary. New species, such as Aleman Grass (Echinochloa polystachya; Olive Hymenachne Hymenachne amplexicaulis; and Knobweed Hyptis capitata have recently been found in the Park. Weeds also have the potential

to be carried into the Park on vehicles. There are significant weed infestations in Jabiru and other lease areas that could pose a major threat to the rest of the Park if they are not effectively managed (DNP, 2007). Grassy weeds (Mission Grass and Gamba Grass) continue to be major challenges, as are aquatic weeds such as Salvinia and Olive Hymenachne (DNP, 2012).Therefore while weed management in the park is exemplary, given the difficulty of preventing weeds from entering into the property and the number of known invasive species already affecting the property, the threat of invasive plant species on WH values remains high. Note that invasive grass species in particular change fire processes which are another threat to the property. Biological control for the grass species cannot be considered as they continue to be used in pasturelands adjoining the property, which will serve as a continual source of new infestations.

► Invasive Non-Native/ Alien Species

High Threat

Invasive animals in the property include Asian water buffalo, cattle, pigs, horses, donkeys, cats, dogs, rats, mice, house geckos and European bees. Cane toads were recorded in Kakadu for the first time in early 2001. The management objective for feral animals in Kakadu is to limit, as far as possible, their adverse effects on the environment while taking into account the views and economic interests of traditional owners (http://www.environment.gov.au/parks/kakadu/management/programs/feral-animals.html). While the buffalo caused enormous problems in the past with an estimated population of 20,000, today only a few hundred remain. While all the invasive animals impact WH values, possibly the most harmful are feral pigs, cats and cane toads, which have been partially implicated in the decline in small mammals, goanna and snake populations over the past few decades (Woinarski et al. 2001; Palmer et al. 2003; Doody et al., 2007; Woinarski et al. 2007; Burbridge et al., 2009; Woinarski et al., 2010;). While management response is excellent, the impact of invasive animals on WH values is so great that the threat level must be assessed at high, and would be critical if good management was not in place.

► Fire/ Fire Suppression

High Threat
Inside site

Outside site

Fire management in the park has tried to mimic traditional burning practices to look after country and to protect people and Park assets. This approach includes creating a mosaic of burnt and unburnt country, reducing the amount of grass fuel early in the dry season to help stop late dry season fires covering large areas, and ensuring that communities and assets vulnerable to fire are protected (DNP, 2007). Despite being carefully monitored and managed, fire has continued to plague the plateau (Petty et al., 2007). Therefore even though the fire issues are being monitored and worked on, the threat to WH values from uncontrolled wildfires remains high.

► Mining/ Quarrying

High Threat
Inside site
Outside site

Mining has been viewed as one of the principal threats to the property given that a uranium mine operates in an enclave within the property and uranium ore has to be transported through the property, posing risk of radioactive contamination. Voluminous reports, monitoring and discussion about this issue have ensued (see WHC, 1998; Environment Australia, 1999 and others in http://www.environment.gov.au/ssd/supervision/arr-mines/jabiluka.html). Restoration of small-scale mining has been undertaken elsewhere in the property (IUCN, 1992) and is ongoing in the south of the park (SOC, 2003; DNP, 2012). Koongarra Project Area (1,228 ha), one of the three mining leases excised from the property, was added to the property in 2011 (Decision 35COM 8B.49), meaning that mining at Koongarra will not be permitted. Safe storage of the uranium tailings is also a concern.

► Other Ecosystem Modifications

Low Threat
Inside site
Outside site

It has been hypothesised that a rise in CO2 in the atmosphere is favouring woody plant growth to the detriment of treeless floodplains, important habitat for numerous species and migratory waterfowl (Bowman et al., 2008). While other factors could also be causing woody encroachment, this rapid

environmental shift is a threat to a number of values to the property.

► Tourism/ visitors/ recreation

Low Threat
Inside site
Outside site

The impacts of increasing tourism include increasing the transmission of invasive species and the risk of fire, as well as damaging landscape values with more roads, infrastructure and waste. Impacts of tourism are covered in the Management Plan (DNP, 2007) and a tourist management plan (KBM, 2008). While these are potential threats and tourism appears to be carefully managed, tourism is still seen as a low threat to the property, although one that could become a greater threat in the future. On the other hand if tourism is seen as a driver for the other high threats (invasive species and fire) then it could also be considered as a high threat.

Potential Threats

High Threat

Potential threats caused by climate change might result in sea level rise, the risk of catastrophic fire, storms or drought or change in the chemical composition of seawater, all of which would impact WH values greatly. New or increased invasions of alien species including pathogens and disease, again compounded by climate change, are another real risk. If the development of pastoral lands in areas surrounding the park and tourism increase this will bring more pressures on the park. It is expected that when Jabiru, the town inside the property specifically created for housing mine workers although also increasingly used by the tourist industry, is relinquished by the mining company when operations finish (expected in 2021), that there will be increased weed invasion. All these potential threats and others are recognised in the management plan (DNP, 2007).

► Other

Low Threat

Unlike many other WH properties in Australia, specific diseases have not been signalled as affecting biodiversity in the park, although it is likely that

some do. If not, it is likely that some diseases or pathogens, unless they cannot survive in Kakadu's environmental conditions, will arrive. Risk preparedness plans for the introduction of disease and pathogens are in place (DNP, 2007).

► Other

Data Deficient

The park's wetlands have been identified as being particularly susceptible to saltwater intrusion resulting from feral animal activities or future changes in climate and sea levels. 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 (SOC, 2003).

► Temperature changes

Very High Threat
Inside site
Outside site

Climate change has the potential to damage every WH value in the property at a large scale. For example, if sea level rises, the entire floodplain area could disappear, and there will be saltwater incursions into freshwater ecosystems. Biodiversity will have no refuges to retreat to and not enough time to adapt. Climate change may also change fire seasons and regimes, and create increased potential for the spread of exotic flora and fauna. Park managers are implementing a climate change strategy that includes a range of adaptation, mitigation and communication actions to manage the anticipated changes. The challenge is whether management will be able to cope with unpredictable changes in temperature, storm frequency, flooding, drought and changes in sea water composition to conserve the WH values (SOC, 2003). Maximising ecological resilience to increase capacity as climate change manifests and implementing the recommendations of the climate change strategy is seen as a major challenge (DNP, 2012).

Protection and management

Assessing Protection and Management

► Relationships with local people

Mostly Effective

The joint management between the traditional aboriginal land-owners and park management has been highlighted as exemplary, “a model of effective park management” (IUCN, 1992). A majority of Board members represent the park’s traditional owners (SoOUV, 2013).

► Legal framework and enforcement

Highly Effective

The property is well protected by legislation and is co-managed with the Aboriginal traditional owners, which is an essential aspect of the management system. The Director of National Parks performs functions and exercises powers under the Environment Protection and Biodiversity Conservation Act 1999 in accordance with the park’s management plan and relevant decisions of the Kakadu National Park Board of Management. These arrangements ensure that the park has effective legal protection, a sound planning framework and that management issues are addressed (SoOUV, 2013). 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; and Jabiru Town Development Authority Act 1978 (SOC, 2003).

► Integration into regional and national planning systems

Highly Effective

Seems good according to the Park Annual Report (DNP, 2012).

► Management system

Highly Effective

The Fifth Management Plan expires 31 December 2013. Other significant management documents: Tourism Master Plan, District and Stone Country

fire management plans, Crocodile Management Strategy, Feral Animal Management Strategy; Gunlom Mine Sites Rehabilitation Strategy, Cultural Heritage Strategy, Weed Management Strategy, Climate Change Strategy, and Waste Management Strategy (DNP, 2012).

► Management effectiveness

Mostly Effective

Management effectiveness can be measured by trends for native species and threatening processes (Parr et al., 2009). While the data is not available to make a judgement, there are indications that there is some deterioration with native species and an increase in threatening processes (see worksheets 2 and 4), although at the same time it is difficult to see how the management system could be improved.

► Implementation of Committee decisions and recommendations

Mostly Effective

The last SP report dates from 2003. There has been a gradual move to greater implementation of Committee decisions and recommendations. The decision by the SP and managers to integrate the 1,228 ha enclave known as the Koongarra Project Area into the property in 2011 is exemplary (IUCN, 2011).

► Boundaries

Mostly Effective

The straight-line boundaries of Kakadu are artificial. Although the South Alligator River drainage basin is contained within the park, headwaters of other rivers lie outside. In an ideal world, ecological/hydrological criteria would allow a different configuration and might also include the drainage basin of the East Alligator River in Arnhem Land which would add additional values and integrity to Kakadu. There are also important natural values in the Cobourg Peninsula and in some of the coastal wetlands to the west of the park (IUCN, 1992). It would be useful to extend the boundaries or add buffer zones, but given the large size of the property this is probably unlikely. However, the issue of changing the zoning plan within the existing park and making the previous no-go wilderness area more accessible has been identified as a problem. However the inclusion in 2011 into the property of

one of the three mineral leases that pre-exist the establishment of the park (Koongarra), and stopping mining in this site, is extremely positive (IUCN, 2011).

► Sustainable finance

Highly Effective

Funds are provided each financial year for the 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 (SOC, 2003). Operating budget 2011-12 was $24.048 million, with Capital $2.091 million, Revenue $18.134 million, payments to traditional owners $1.715 million (DNP, 2012).

► Staff training and development

Mostly Effective

Developing staff through formal and informal training programmes is undertaken, although listed as a "major challenge" in the Park Annual Report (DNP, 2012).

► Sustainable use

Highly Effective

Limited sustainable use including hunting (although discouraging lead bullets) is allowed within the park with traditional landowners. A new Cultural Heritage Strategy, after long stakeholder consultations, was implemented in 2012 (DNP, 2012).

► Education and interpretation programs

Highly Effective

Numerous publications to provide educational information on the values of

Kakadu National Park, including guidebooks, Park Notes, maps, information pamphlets, website http://www.environment.gov.au/parks/kakadu/index.html (SOC; 2003).

▶ Tourism and interpretation

Highly Effective

Interpretive programmes, guided walks and cultural activities with traditional owners at selected sites (SOC, 2003). 159,206 visitors (estimate) 2011-2012 (DNP, 2012).

▶ Monitoring

Highly Effective

Monitoring of invasive species, threatened species, fire monitoring, climate change, tourism (DNP, 2012).

▶ Research

Mostly Effective

Research including understanding decline in small mammals and potential impact of climate change on wetland and coastal environments. 20 research permits granted 2011-12. Innovative research on training endangered Northern Quolls to avoid Cane Toad as prey (DNP, 2012).

Overall assessment of protection and management

Highly Effective

Protection and management in Kakadu is highly effective with excellent management plans and qualified staff; investment in research and monitoring, however, could be improved. Possibly due to factors beyond management control some biodiversity values in the park are declining, and monitoring and research to assess, understand and reverse this trend is under way. Some conflicting park objectives, such as biodiversity and cultural management, might reduce the effectiveness of biodiversity conservation efforts. There are also some tensions between management and land owners. However, in general the management response to a wide range of challenges is highly

effective.

▶ **Assessment of the effectiveness of protection and management in addressing threats outside the site**
Some Concern

The greatest external threat to the park arises from the Ranger uranium mine which is located in an enclave within the park. While security procedures are doubtless very high, an accident is always possible and NGOs cite numerous breaches. Therefore, while uranium continues to be mined in the area it is impossible to say that this threat is effectively managed. The only effective protection and management will be when mining operations cease and the mining site is restored. No information on the management of the pastureland leases or the military base surrounding the property.

▶ **Best practice examples**

1. The joint management between the traditional aboriginal land-owners and park management has been highlighted as exemplary, “a model of effective park management” (IUCN, 1992). A majority of Board members represent the park’s traditional owners (draft SoOUV, 2012). 2. Innovative research. Collaborative project with University of Sydney and the Territory Wildlife Park to train Northern Quolls to avoid Cane Toads as prey and to investigate whether this behaviour is passed on to young quolls.

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ **Great natural beauty and sweeping landscapes**
High Concern
Trend:Stable

A new uranium mine was opened in June 1998. Visual encroachment through uranium mining and the associated incremental expansion of urban and infrastructure development in and associated with the town of Jabiru has

impacted landscape values (WHC,1998). As this mine was opened well after inscription, despite the property being very large (1,980,995 ha), an enclave with a uranium mine and its associated development has had an impact on natural values in the property. On the other hand, one of three mining leaseholds, the Koongarra Project Area (1,228 ha), was incorporated into the property in 2011 (IUCN, 2011). While mining in an enclave within the property will always be seen as high concern or critical for this value until all mining activity ceases and the areas are restored, the decision of the traditional land-owners to include one of the three mining leaseholds into the property is extremely positive.

► Vast congregations of migratory waterbirds

Good
Trend:Stable

The floodplains have been designated a Ramsar site and an Important Bird Area (Alligator Rivers Floodplains), with estimates of some 5 million waterbirds using the area (Birdlife, s.d.). The high level of natural variability in wetland area and waterbird populations inherent over much of Australia makes the detection of trends in waterbird population sizes and relationships between these and rainfall, river flows and wetland extent, difficult to analyse robustly without sufficient long-term data (Kingsford et al., 2012). Future monitoring will be possible using the National Waterbird Database. However as there have been no reports of catastrophic declines in the waterbirds at Kakadu, for the moment this value can be assessed as stable. However, any sea level rise due to climate change will have a huge impact on these waterbirds.

► Large and relatively intact landscape allowing continued evolutionary processes

High Concern
Trend:Deteriorating

The decline in biodiversity and invasion of the property by Cane Toads in 2001 means that the intactness of the property has been reduced and evolutionary processes compromised. Invasive plants and other feral animals that were present since before inscription are managed and some have been reduced (DNP, 2012). The change in park zoning has potentially increased access to a strict wilderness area, which could pose a threat to the integrity

of the property (anonymous reviewer). Although the majority of the property is still reported to be in good shape (SOC, 2003), the recent introduction of Cane Toads as well as documented reductions in small mammals and some other species indicates high concern.

▶ Conservation of significant habitats

Low Concern
Trend:Deteriorating

The majority of the property is still reported to be in good shape Dieback of some Melaleuca swamps has been observed in Kakadu's northern wetlands. Saltwater intrusion and/or altered fire regimes associated with weed invasions are possible contributory factors (SOC, 2003).

▶ Threatened, endemic and relict plants

Good
Trend:Stable

No changes in native plant diversity and abundance have been reported despite declines in mammals and some birds, apart from the Melaleuca die-back mentioned above (SOC, 2003).

▶ Threatened, endemic and relict mammals

High Concern
Trend:Deteriorating

There has been a rapid and severe decline of the native mammal fauna in the property (Woinarski et al., 2001; 2010) and Northern Quolls have almost disappeared from the park (Norris et al., 2005). The causes of decline are unclear; however initial theories suggest fire management regimes, feral cats and introduction of disease as the likely cause (SoOUV, 2013).

▶ Threatened, endemic and relict birds

High Concern
Trend:Deteriorating

Partridge Pigeon has been downlisted to VU since inscription of the property as populations in Kakadu have declined substantially over the last decade. This could be due to more or hotter fires, possibly due to invasion of exotic pasture grasses, particularly Gamba Grass Andropogon gayanus, which

reduces cover and increases predation by feral cats (Fraser et al., 2003; Garnett et al. 2011). The same problems might be causing the rarefaction of the Gouldian Finch (NT) (O'Malley, 2006) and the White-throated Grass Wren (VU) (Garnett et al., 2011).

▶ Threatened, endemic and relict frogs

Low Concern
Trend:Stable

No reports of Chytrid fungus attacking frogs in the property, although the introduction of Cane Toads, which eat frogs, could be a problem.

▶ Threatened and endemic reptiles

Good
Trend:Stable

No changes in native reptile diversity and abundance have been reported. Monitoring confirmed steady numbers of estuarine crocodiles and nesting flatback turtles (DNP, 2012).

▶ Threatened, endemic and relict fish

Good
Trend:Stable

No changes in native fish diversity and abundance have been reported.

▶ Threatened and endemic invertebrates

Good
Trend:Stable

No changes in native invertebrate diversity and abundance have been reported, although the introduction of Cane Toads could impact certain invertebrates.

Summary of the Values

▶ Assessment of the current state and trend of World Heritage values

High Concern

Trend: Stable

Despite the large size and strong management of the property, a significant decline in small mammals, some birds and possibly other species has been observed since inscription. The problem is complex with potential causes including disease, predation and over-grazing by feral animals, and uncontrolled wildfire (or a combination of these). The introduction of Cane Toads to the park in 2001 is a negative development, as has been the Ranger uranium mine which operates in an enclave within the property and impacts on scenic values and integrity. On the other hand, vast areas of the property are still in excellent condition and park management is dealing with all these challenges. However, until deteriorating trends to the current state of World Heritage values are reversed, the situation has been assessed as of High Concern.

Additional information

Key conservation issues

▶ Climate change

Global

Already being experienced and more effects anticipated, management response is a major challenge. There are information gaps on the potential impact of climate change, particularly on freshwater wetlands

▶ Invasive species

Local

Aquatic and terrestrial weed species and pest animals causing decline in natural values.

▶ Fire regimes

Local

Fire management is needed as the impacts of frequency and timing of fires

affect wildlife (particularly in woodland and sandstone habitats).

▶ **Radiation**

Local

Monitoring and management of the South Alligator Valley containment area, which contains low-level radioactive materials from historic mining sites.

▶ **Marine protection**

Local

Need to improve understanding and protection of the marine environments off the Kakadu coast.

▶ **Tourism**

Local

Significant increase in visitation as a result of its World Heritage inscription. Some inappropriate use of turtle habitat, including nesting and feeding grounds. Visitors are encouraged to enjoy the park in ways that do not adversely affect its natural and cultural values.

Benefits

Understanding Benefits

▶ **Is the protected area valued for its nature conservation?**

Conservation of unique biodiversity and landscape

▶ **Does management of the site provide jobs (e.g. for managers or rangers)?**

Important source of revenue and jobs

▶ **Outdoor recreation and tourism**

Kakadu National Park contributes tens of millions of dollars to the Northern Territory economy each year through tourism and purchase of significant

quantities of goods and services from local suppliers. (DNP, 2007).

▶ **Sacred natural sites or landscapes**

This large park (half the size of Switzerland) includes large wilderness area which until recently was zoned, restricting almost all access. It appears that access has not been increased.

▶ **Importance for research**

Great deal of research and education in the property which also creates jobs

▶ **Wilderness and iconic features**

Conservation of sacred sites and historical aboriginal sites

▶ **Water provision (importance for water quantity and quality)**

Water purity and catchment, soil stabilisation, coastal protection.

Summary of benefits

Due to the large size of the property and the fact that it is owned by Indigenous people who still have traditional land use rights within the property, the park is of primary benefit to the people who live within and near its borders, as well as providing significant benefits to the wider Australian and global community. In addition to nature conservation and conserving cultural and wilderness values, the property provides a wide range of ecosystem services, furnishes a wealth of scientific knowledge and provides jobs either through park management, tourism, research and education.

Projects

Compilation of active conservation projects

№	Organization / individuals	Project duration	Brief description of Active Projects
1	Park and the Northern Territory Department of Natural Resources, Environment, the Arts and Sport		Targeted surveys of threatened species in recognised biodiversity hotspots in the park, largely in the Arnhem Land Plateau, due for completion on 30 June 2013 under the current agreement. All surveys involve park staff (including trainees and school-based apprentices), Northern Territory government staff, neighbouring Indigenous ranger groups and traditional owners from Arnhem Land.
2	University of Sydney and the Territory Wildlife Park		Training Northern Quolls to avoid cane toads as prey and to investigate whether this behaviour is passed on to young quolls is continuing. A total of 67 quolls have been released to date with subsequent trapping events producing promising results. DNA sampling which distinguished wild and trained quolls revealed that roughly half the juvenile quolls in the population are the offspring of trained females, which is encouraging. A larger wild quoll population than was thought to exist in this area of the parks was also detected as a result of this work.
3	Australian Government National Environmental Research Program (NERP)		Six projects focusing on the potential impact of climate change on wetland and coastal environments. A further NERP-funded project focussing on the potential impact of feral cats on small mammals is currently being planned, including consultations with traditional owners.
4	Kakadu NP		Management of pest plant and animal species.
5	Kakadu NP		Identifying the cause of small mammal decline.

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