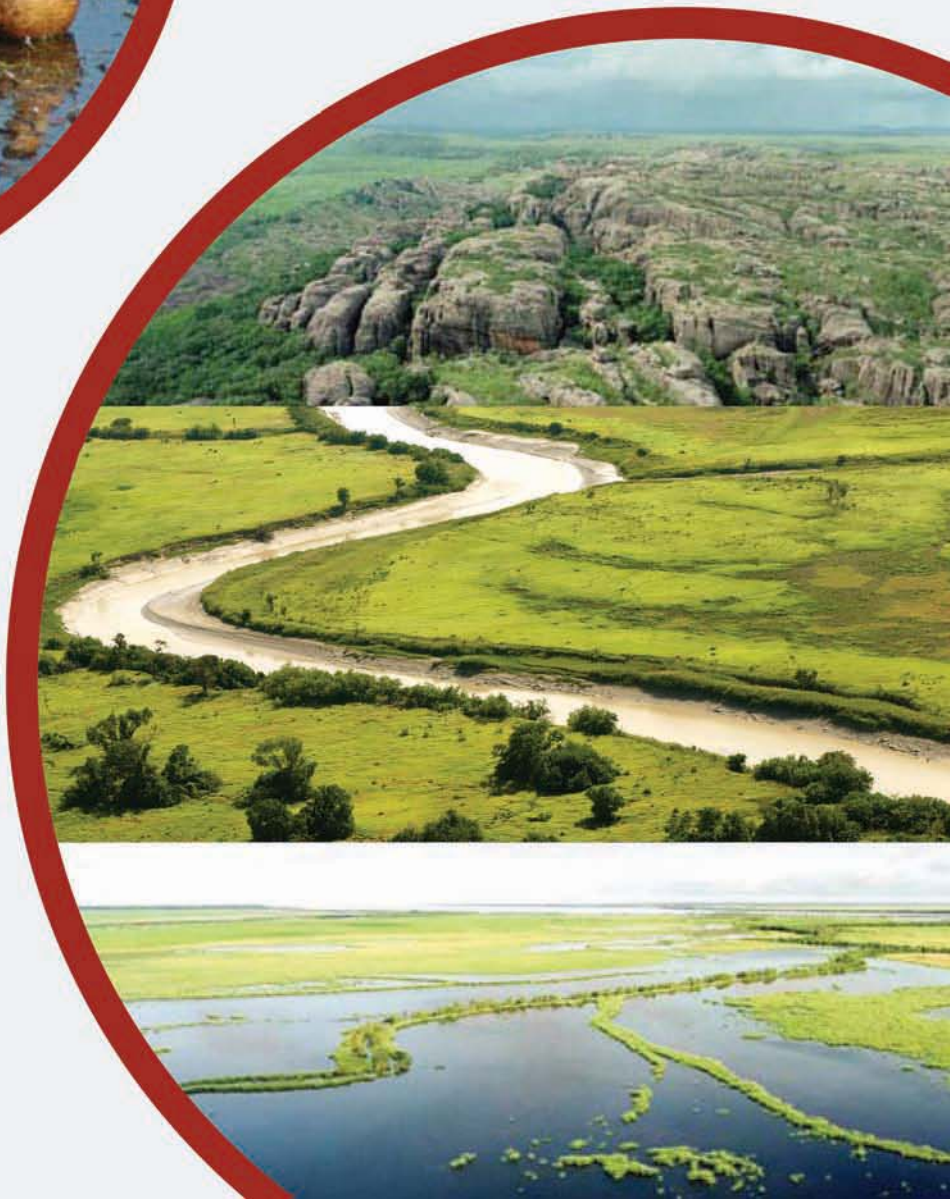
kakadu™
NATIONAL PARK

Climate Change Strategy
2010–2015



Australian Government
Director of National Parks

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Kakadu National Park
Climate Change Strategy 2010–2015

1. Background

The Intergovernmental Panel on Climate Change Fourth Assessment Report concluded that human induced climate change is expected to have a discernable influence on many physical and biological systems. The resilience of many ecosystems is likely to be exceeded over the course of the twenty-first century and approximately a quarter of all plant and animal species are likely to be at increased risk of extinction if increases in global average temperature continue to match current projections (IPCC 2007).

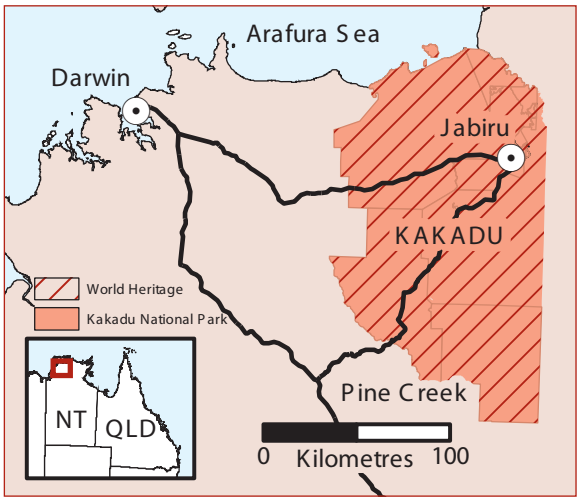

Figure 1: Location of Kakadu National Park

Kakadu National Park is located 200 kilometres east of Darwin in the wet-dry tropics of the Alligator Rivers region of the Northern Territory (Figure 1) and covers an area of 19,798 square kilometres. The park has a high degree of connectivity with adjacent natural areas, with Arnhem Land (Aboriginal land) to the east, Nitmiluk National Park to the south and several pastoral properties to the west (Hyder 2008). The park is comprised of a variety of landforms and habitats including the sandstone plateau and escarpment, extensive areas of savanna woodlands, open forest, floodplains, mangroves, tidal mudflats, coastal areas and monsoon forests (Director of National Parks 2007).

As the park is very large and occurs within a region of extensive natural vegetation, Kakadu is expected, all else being equal, to be more resilient to climate change than many other smaller conservation reserves in Australia. The deeply-incised sandstone escarpment contains a spectrum of extremely fine-scale microclimates that has provided refuge over many thousands of years for species that are exposed to a generally inhospitable climate. Kakadu is therefore equipped to provide refugia for species that are particularly vulnerable to climate change.

Kakadu is one of the very few places listed as a World Heritage Area for both its cultural and natural values. It is an iconic place of exceptional beauty and is considered one of the most biologically diverse places on the Australian continent.

The park is home to 271 bird species (over one third of Australia's bird fauna), 77 mammal species (about one quarter of Australia's land mammals), 132 reptile species, 27 frog species and 246 fish species (Director of National Parks 2007). Kakadu's wetlands are internationally significant and are a major staging point for migratory birds.

Generations of Aboriginal people–known as Bininj/Mungguy–have lived and cared for this country for tens of thousands of years. Their deep spiritual connection to the land dates back to the Creation or Dreamtime. Bininj/Mungguy believe that during the creation time ancestral beings known as the first people or *Nayahunggi* journeyed across the landscape to create the landforms, plants, animals and Aboriginal people we see today. They left language, ceremonies, kinship, and rules to live by. The cultural obligations and responsibility for country handed down by the ancestors are still central to the lives of Bininj/Mungguy, and age-old skills such as patch burning are integral to the modern management of the park. Kakadu's Aboriginal rock art documents these creation stories and constitutes one of the longest historical records of any group of people in the world (Director of National Parks 2007).

Kakadu is jointly managed under the direction of a Board of Management, which has an Aboriginal majority representing the traditional owners. Day-to-day management is carried out by Parks Australia, a division of the Australian Government Department of the Environment, Water, Heritage and the Arts. Park managers are in a unique position to adapt current park management practices based on a contemporary and scientific understanding of the likely impacts of climate change and the accumulated traditional knowledge of the changes that have occurred in the Kakadu region over thousands of years.

The *Kakadu National Park Climate Change Strategy 2010-2015* recommends the preliminary adaptation, mitigation and communication actions that are required to manage the consequences of climate change and reduce the carbon footprint of the park. The strategy is consistent with the policies and actions of the *Kakadu National Park Management Plan 2007-2014* and the objectives identified in the *Parks Australia Climate Change Strategic Overview 2009-2014*.

Climate change is a long–term issue and this strategy is an incremental 'first step' to what must be a long-term and enduring response. This strategy is an adaptive tool subject to ongoing review, and management responses will be amended to take account of improvements in the understanding of the implications of climate change for the park.

2. Regional Climate Change Projections

The predicted effects of climate change in the Arnhem Land-Kakadu region include sea level rise, rise in temperatures, variation in the amount and pattern of rainfall, and changes in the frequency and intensity of extreme weather events (Hyder 2008). A summary of these effects are provided in Table 1. These projections are based on high range or worst case global warming scenarios (uncertainties shown in brackets).

Table 1: Climate change scenarios for Arnhem Land–Kakadu region (Hyder 2008)

Climate change factor	Baseline (1975-2004)	2030 scenarios	2070 scenarios
Sea level rise	0	+17cm	+50cm
Annual average temperature	Max 34.2°C Min 21.9°C	+1.3°C (±0.6°C)	+4°C (±1.7°C)
Annual average no. of hot days (>35°C)	11 days (Darwin)	+62 days	+295 days
Annual average rainfall	1,077mm	0% (±7%)	0% (±23%)
Seasonal average rainfall			
Summer	691mm	0% (±7%)	0% (±23%)
Autumn	267mm	0% (±15%)	0% (±45%)
Winter	6mm	n/a	n/a
Spring	113mm	+4% (±19%)	+4% (±57%)
Rainfall patterns	-	Extended dry periods and more frequent and intense rainfall events	
Annual average relative humidity	53%	-1.1% (±1.9%)	-3.4% (±5.7%)
Annual average potential evaporation	n/a	+4% (±4%)	+11% (±11%)
Extreme weather events	-	Increase in extreme weather events such as Category 5 tropical cyclones	
CO_2 concentration	353ppm	+165ppm	+365ppm

3. Impacts of Climate Change for Kakadu National Park

Dunlop and Brown (2008) identified the key threats of climate change to the northern tropical savannas as:

- saltwater incursions into freshwater ecosystems
- changing fire seasons
- potential for spread of exotic flora and fauna including high dispersal during the wet season
- more intense storm activity.

There is a degree of uncertainty regarding how some of these projections of climate change will specifically affect the natural, cultural and economic values of Kakadu National Park. However, based on regional climate change projections the following implications are likely.

Saltwater intrusion

Changes to salt and freshwater wetlands through saltwater intrusion have already been observed in the park over the past few decades (Hyder 2008) which is understandable given that global sea levels have risen by 17cm over the 20th century (Department of Climate Change 2007). Low-lying coastal plains are currently only 0.2-1.2 metres above mean high water level and an increase in sea level rise of up to 0.5 metres by 2070 indicates that further saltwater intrusion and consequent changes to freshwater ecosystems is likely.

The variability of this intrusion on a localised scale is hard to predict without detailed hydraulic and terrain modelling. The displacement of saltwater-sensitive species (e.g. *Melaleuca* species) with encroaching mangroves and saline mud flats is expected to continue. These changes will impact on existing freshwater dependent wildlife such as birds along with the traditional food resources found in freshwater wetlands such as magpie geese, barramundi and freshwater turtles (Hyder 2008). Sacred sites may also be affected.

Fire frequency and intensity

An increase in annual average temperatures and the incidence of days greater than 35°C is expected to increase the frequency and intensity of fires (Hyder 2008). This is likely to impact vegetation communities that are already vulnerable to fire such as *Callitris* stands in the lowland, *Melaleuca* stands on the floodplain and areas of monsoon rainforest that exist in small patches throughout the savanna landscape. Changing climatic conditions will influence the use, timing and controllability of fire as a management tool in the park.

Small mammals such as the northern quoll (*Dasyurus hallucatus*), golden-backed tree-rat (*Mesembriomys macrurus*) and the golden bandicoot (*Isoodon auratus*) are more vulnerable to increased frequency and intensity of fire as are granivorous birds such as the Gouldian finch (*Erythura gouldiae*) and the eastern partridge pigeon (*Geophaps smithii smithii*) that rely on substantial rainy seasons and particular fire regimes for grass seed production.

Flood frequency and intensity

More frequent and intense rainfall events are likely to increase the possibility of greater and more frequent flooding of the Alligator River systems in Kakadu. An increase in river flow, and in particular, overbank flows, has led to channel widening, bank steepening and an increase in sediment deposition in a neighbouring tropical river system (Wasson et al. 2010) which may also be the case in the Kakadu context.

Indigenous and cultural impacts

The loss of sacred sites can be devastating to a community. Some cultural expression would appear to be directly threatened by climate change. Kakadu's freshwater wetlands are a major source of sustenance for the Bininj/Mungguy providing waterbirds, fish, turtles, crocodiles and freshwater food plants such as waterlilies. Increased saltwater intrusion is likely to impact on the distribution and abundance of traditional food sources (e.g. magpie geese (*Anseranas semipalmata*)) and alter the flowering and fruiting of bush tucker which, in turn, may limit traditional hunting and gathering activities. Access to traditional hunting areas and sacred sites may be affected by sea level rises.

An increase in the frequency and intensity of extreme weather events, particularly cyclones and storm surges, is likely to challenge the sustainability of some Indigenous communities located in low-lying coastal areas (Ibbett 2010).

Changes in frequency and intensity of fire as well as changes in the intensity of extreme weather events may exacerbate damage to rock art sites (Hyder 2008).

Climate change may offer some economic benefits to Indigenous communities through participation in carbon trading programs and employment opportunities in monitoring the impacts of climate change and undertaking remedial and mitigation activities (Ibbett 2010).

Biodiversity impacts

Higher annual average temperatures are likely to affect triggers for life cycle events (e.g. crocodile breeding, determination of gender of reptile hatchlings), population ecology and the occurrence of suitable habitats for certain fish and reptile species (Dunlop & Brown 2008). Increases in water temperature will change aspects of water quality (e.g. increased oxygen demand and reduced supply) which is likely to lead to changes in the distribution of freshwater fish species found within the park. Bird, fish and invertebrate species that are dependent on mangrove and saltmarsh communities are likely to be advantaged by the predicted increase in the extent and distribution of these habitat types (Hyder 2008).

The eggs of pig-nosed turtles hatch in response to rising water levels in the wet season.

Climate change will impact on the ecology of individual organisms that will ultimately lead to changes in populations. Dunlop and Brown (2008) identified four main outcomes that might be expected from populations in response to the effects of climate change. These outcomes are not mutually exclusive as a number of the factors may occur together within a population. They are:

- survival within the current distribution (although there may be changes in abundance, behaviour or habitat)
- evolutionary adaptation to enable survival (this may be at a genetic, species or population level)
- changes in population distribution, or
- extinction.

Increased atmospheric CO_2 concentrations may increase photosynthesis and plant biomass of certain species that may impact on vegetation community structure and composition (Hyder 2008). Invasive annual grasses may have a competitive advantage over native grass species which may lead to increased weed invasion and increased fuel loads. Woody shrubs may also be advantaged over grassy species which could lead to changes in savanna communities.

An increase in the frequency and intensity of extreme weather events such as tropical cyclones is expected to have a significant impact on coastal mangrove habitats, *Melaleuca* swamps, sandstone country and eucalypt woodlands. Severe waves and storm surges is likely to impact coastal habitat. Disturbance to the canopy may lead to increased weed invasion or an increase in grass cover which could increase overall fuel loads in the park (Hyder 2008).

Arrival of new species

Climate change is likely to change the species composition of communities and ecosystems. Invasive weeds and pests will be more likely to establish due to increased disturbance and less suitable conditions for local species (Dunlop & Brown 2008). Changing rainfall patterns are also likely to increase the dispersal potential of invasive species during the wet season. While some of these new arrivals may be exotic species spreading from naturalised populations, some of them will be native species that will spread from their current distribution. All new arrivals (exotic or native) are likely to have an impact on existing resident populations. Determining which species might establish in new areas and what their impact will be will be a very difficult task for park managers.

Visitor impacts and human health

Saltwater intrusion of freshwater wetlands may impact on visitor expectations of the park. The relationship between visitor expectations and actual visitor experiences in relation to fauna and flora interactions, park access and weather conditions is something that will need to be managed as the impact of climate change becomes better understood. There may also be a compression of the tourist season due to increased flooding and higher day temperatures (Tremblay 2010).

An increase in the annual average temperature, the number of days greater than 35°C and changing rainfall patterns is likely to impact on visitor and staff comfort and satisfaction. The incidence of heat stroke and heat stress is also likely to increase. More extreme weather events may increase the risk of injury to both park visitors and staff.

Changes in temperature and rainfall patterns may lead to an increase in the transmission of diseases by insects (and especially mosquitoes) such as Ross River virus, malaria, encephalitis and meliodosis (Hyder 2008; Australian National University 2009). The impacts of climate change may pose significant challenges to the management of people's health, particularly in Indigenous communities that are disproportionately vulnerable to climate change due to:

- a close connection between the health of their country and their physical and mental health
- inadequate infrastructure
- lower socio-economic status,
- existing chronic health problems such as cardiovascular disease (Green 2006).

Buildings and infrastructure

More extreme climatic conditions are expected to place additional pressure on the resilience and suitability of park infrastructure, which is likely to have flow-on implications for maintenance costs. The capacity of the park to monitor the condition of infrastructure during the wet season is likely to be further challenged by increased extreme weather events. Increased erosion caused by more intense storm activity is likely to adversely impact infrastructure such as walking tracks and roads. There may be a need to relocate existing assets from high risk areas such as flood–prone areas.

All communities in the park have a high degree of dependence on receiving supplies by road from Darwin. Extreme weather events may change the hydrology of the park over extended periods which are expected to increase the incidence of road access being blocked to many communities. Road closures due to flooding have already resulted in shortages of supplies which are expected to increase under climate change.

Higher temperatures are likely to increase the demand for energy and water for cooling systems. Infrastructure to meet this growth in demand for peak generating capacity needs to be managed to ensure that the park's carbon footprint is minimised as much as practicable.

Flood damage on the Kakadu Highway

4. Recommended Management Actions

The recommended management actions align with the five objectives of the *Parks Australia Climate Change Strategic Overview 2009-2014* outlined below.

1. To understand the implications of climate change.
2. To implement adaptation measures to maximise the resilience of our reserves.
3. To reduce the carbon footprint of our reserves.
4. To work with communities, industries and stakeholders to mitigate and adapt to climate change.
5. To communicate the implications of, and our management response to, climate change.

4.1 Understand the implications of climate change

A good knowledge of the implications of climate change is necessary to enable us to prepare and implement an effective response. Given the uncertainties of climate change at a local scale, and our current knowledge gaps, the task of improving our understanding will be an on-going effort. As an initial step, the park convened a Climate Change Symposium in August 2008 (Winderlich 2010) to build greater capacity of park managers, scientists, traditional owners and other stakeholders and to improve understanding of present and future climate change impacts. Understanding how various natural and cultural elements of the landscape may respond to changing conditions, and designing long term research and monitoring programs that inform management responses is a priority.

	Recommended Management Actions	Timeframe
4.1.1	Identify priorities for further research or integrated monitoring programs to study the causes and effects of landscape change, how these processes interact and how effects vary across different landscape types and vegetation communities. Use this information to refine decisions about acceptable change. (MP 5.6.12)	Ongoing
4.1.2	Partner with research institutions on projects that target identified knowledge gaps and improve understanding of the resilience of species and communities in the park.	Ongoing
4.1.3	Optimise access to existing baseline information through improved data sharing between organisations and the digitising and cataloguing of scientific information on a web-based information portal.	By 2014
4.1.4	Partner with traditional owners and research institutions to undertake a risk assessment of the likely impacts of climate change on significant cultural sites and important hunting grounds and identify the mitigation measures that may be required.	By 2013
4.1.5	Work with partners to develop a high resolution Digital Elevation Model (DEM) of the park.	By 2014

	Recommended Management Actions	Timeframe
4.1.6	Work with partners to develop spatial information systems that assist in predictive modelling of climate change impacts on the distribution and abundance of vulnerable species and communities (including invasive species) under different scenarios.	By 2015
4.1.7	Continue existing long term monitoring programs for significant fauna species expected to be impacted by climate change (e.g. flat-back turtle, crocodiles) and significant flora species and communities (e.g. fire plot and mangrove monitoring).	Ongoing
4.1.8	Identify a set of baseline parameters (climatic, geomorphological, hydrological, ecological and social) to effectively monitor the effects of climate change.	By 2012
4.1.9	Establish and implement a monitoring program for parameters identified in Action 4.1.8 that are not already targeted in existing long term monitoring programs. Methods used to monitor the effects of climate change must have appropriate sensitivity to detect changes. Monitoring program should have explicit measures for communicating outcomes between land managers, researchers and the general community.	By 2013
4.1.10	Continue to improve data management and the technical capacity of park staff (e.g. GIS, remote-sensing and field monitoring skills).	Ongoing

Turtle surveys are regularly conducted on Field Island

4.2 Implement adaptation measures to maximise the resilience of our reserves

The condition of the natural and cultural values of the park is dependent on the rate of climate change itself and the resilience of the park to cope with this change. A focus of park management is to reduce the impact from invasive species and inappropriate fire regimes. This will maximise the resilience of species and communities to adapt to the additional challenges brought about by climate change.

Given the size of the park and the number of microclimates found in the deeply-incised sandstone escarpment, Kakadu may display a greater level of resilience than other conservation reserves in Australia. The park needs to continue to be managed within the broader landscape, in partnership with park neighbours, in order to maximise opportunities for changes in the distribution of species or populations.

	Recommended Management Actions	Timeframe
4.2.1	Continue to implement existing strategic weed and feral pest monitoring and control programs to maximise the resilience of species and habitats in the park in accordance with Sections 5.11 and Section 5.12 of the Management Plan.	Ongoing
4.2.2	Continue to develop and implement landscape unit based fire management strategies for the major landscape types in the park in accordance with Section 5.7 of the Management Plan.	Ongoing
4.2.3	Identify species and habitats where impacts from feral pests, weeds and fire are likely to be exacerbated by climate change and revise existing feral pest, weed and fire management programs accordingly.	By 2012
4.2.4	Identify, map and protect areas likely to be used as transitional or habitat refugia that will allow for shifts in the distribution and abundance of species and communities in the face of climate change.	By 2013
4.2.5	Obtain expert engineering and environmental advice on measures needed to protected significant freshwater habitats from saltwater intrusion. Work with Bininj and stakeholders to make decisions about the need for intervention and the choice of available options. (MP 5.6.11)	By 2015
4.2.6	Continue collaboration with neighbours (e.g. Indigenous ranger groups, Nitmiluk National Park) to ensure coordination of data, fire, weed and feral management.	Ongoing
4.2.7	Continue collaboration with Northern Territory Government and the Northern Territory Bush Fire Council in relation to fire management research projects and incorporate key findings into fire management strategies.	Ongoing
4.2.8	If parts of the landscape are changing in ways that are of concern, the Director and Bininj, in consultation with relevant stakeholders, will jointly decide on further monitoring requirements, and whether protective, rehabilitation or adaptation measures are feasible. If cost effective, appropriate actions will be implemented. (MP 5.6.1)	As required

4.3 Reduce the carbon footprint of our reserves

The park adopts environmental best practice principles for resource use and management of waste products in the park. These principles are consistent with the need to conserve the park's natural and cultural resources, the park's status as a World Heritage area and meeting broader commitments to reduce greenhouse gas emissions, reduce water use and minimise the potential impacts associated with waste management.

Park operational activities such as electricity generation and use, transport, housing design, development of new infrastructure and waste management all contribute to the park's carbon footprint. There is currently a strong dependency on diesel generators for providing power to park buildings, staff and community houses. The park's remote location also presents particular challenges for recycling and disposal of waste as there are no recycling facilities within a reasonable distance for waste generated in the park.

Land management activities such as revegetation projects, fire management and pest management also have implications for the carbon cycle. It is necessary to better understand the impact of land management activities (including carbon sequestration) on the size and nature of the park's carbon footprint to allow performance to be holistically measured and improved over time. Careful management of these activities can help to reduce overall emissions and carbon loss.

Parks Australia will aim to reduce greenhouse gas emissions from park operational activities (such as energy use, transport and waste management) to 10 per cent below 2007-08 levels by mid 2015.

	Recommended Management Actions	Timeframe
4.3.1	Undertake a carbon emissions audit (consistent with ISO14064-1) that considers energy use, waste, water and support infrastructure (e.g. insulation) across all buildings, vehicles and equipment used in the park.	By 2012
4.3.2	Develop an environmental management plan for the park that identifies actions to reduce the carbon footprint of park operations and the level of carbon emission reductions associated with each mitigation action.	By 2012
4.3.3	Until an environmental management plan is developed (as per Action 4.3.2), investigate the feasibility of: - converting at least one diesel-powered generator to a solar-hybrid power generator (or more efficient system) - transitioning existing electric hot water systems to solar hot water as replacement becomes necessary - installing energy efficient light fixtures and light-controlling devices (e.g. motion sensors) in all park facilities - replacing older vehicles with more efficient vehicles - establishing guidelines to formalise waste reduction strategies into standard park practices (e.g. reducing consumption, printing double sided, recycling)	Ongoing
4.3.4	Continue to promote renewable energy projects within the park to reduce reliance on diesel use in power generation.	Ongoing
4.3.5	Work with research partners to improve quantification of the carbon cycle as it relates to the management of fire, vegetation, soil and invasive species (particularly ruminants) in the park.	By 2014

	Recommended Management Actions	Timeframe
4.3.6	Based on the quantification of the carbon cycle of land management activities (Action 4.3.5), refine weed, feral pest and fire management regimes to reduce the carbon footprint of the park and maximise carbon retention in natural vegetation.	By 2015
4.3.7	Investigate opportunities for the park to participate and capitalise on future carbon trading schemes.	Ongoing

4.4 Work with communities, industries and stakeholders to mitigate and adapt to climate change

Many communities and businesses rely on Kakadu National Park to attract tourists and provide essential ecosystem services. Climate change will have an impact on these communities and industries and they will need to mitigate and adapt to the changes. The park will work with local communities and stakeholders to identify and support proactive measures to reduce the negative impacts of climate change, and to adapt where climate change induced impacts are unavoidable. The increase in frequency and intensity of extreme weather events will necessitate the development of risk control measures to protect life, infrastructure and the natural and cultural values of the park.

	Recommended Management Actions	Timeframe
4.4.1	Investigate opportunities to assist tourism businesses dependent on the park to adapt their businesses to the impacts of climate change.	Ongoing
4.4.2	Continue to work with Aboriginal outstations and other park stakeholders (e.g. tourist accommodation, Jabiru township) to promote alternative energy projects (such as the *Bushlight* project) to implement alternative energy systems to reduce reliance on diesel use in power generation.	Ongoing
4.4.3	Identify employment opportunities for Indigenous communities to participate in climate change monitoring and remedial activities.	Ongoing
4.4.4	Continue training of key staff in the Australasian Inter-service Incident Management System (AIIMS) to ensure improved and coordinated incident management.	Ongoing
4.4.5	Continue the park's active role on the local Counter Disaster Committee and continue to hold joint exercises with relevant disaster management agencies to test emergency response plans and capacity to react to extreme weather events.	Ongoing
4.4.6	Conduct an infrastructure risk assessment to identify assets at risk from climate change impacts and extreme weather events. Assessment should recommend assets requiring upgrading, relocation or those unsuitable in the future climate change environment. Construction and building codes for park assets should be reviewed to ensure that infrastructure will be able to cope with extended periods of inundation and saltwater intrusion.	By 2012
4.4.7	Based on the outcomes of Action 4.4.6, consider the development an evacuation plan for Indigenous communities, ranger stations, the Gagudju Lodge Cooinda, and the Aurora Kakadu South Alligator threatened by extreme cyclones and/or the feasibility of developing flood-proof cyclone shelters.	By 2013

4.5 Communicate the implications of, and our management response to, climate change

Climate change is a global issue affecting all aspects of our community and it is vital we share our knowledge with stakeholders, government bodies and the general public. This will ensure that stakeholders and the public are informed about potential climate change impacts and the management directions that are being taken. This also ensures that efforts between government agencies, scientific researchers and the community are well coordinated.

	Recommended Management Actions	Timeframe
4.5.1	Develop and implement a communications strategy to better inform staff, traditional owners, stakeholders (including the tourism industry) and the general public of the implications of, and our management response to, climate change.	By 2012
4.5.2	Support the maintenance of publicly available information on the Parks Australia and Kakadu websites for climate change policies, strategies and other documents relevant to the park.	Ongoing

5. Implementation and Review

The *Kakadu National Park Climate Change Strategy 2010-2015* will be implemented over a five year period. While the strategy is consistent with the *Kakadu National Park Management Plan 2007-2014*, implementation of the recommended management actions is subject to budgetary and resource constraints. The strategy will be reviewed on a rolling basis to take account of new information or changes in policy directions.

6. References

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Prepared by: Director of National Parks

Note: This strategy sets out the preliminary actions and tools necessary to manage the consequences of climate change at Kakadu National Park. While the Australian Government is committed to acting in accordance with the strategy, the attainment of objectives is subject to budgetary and other constraints affecting the parties involved. Proposed actions may be subject to modification over the life of the strategy due to changes in knowledge and policy direction.

This plan should be cited as:

Director of National Parks 2010. *Kakadu National Park Climate Change Strategy 2010-2015*. Department of the Environment, Water, Heritage and the Arts, Canberra, Australia.

This strategy is available from online at environment.gov.au/parks/climate.html

Increased average annual temperatures and occasion of severe weather events have potential to increase the frequency and severity of wildfires in the park