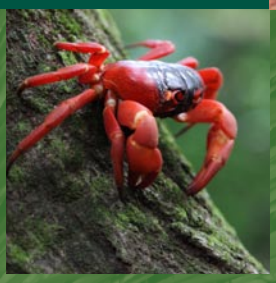
Australian Government
Director of National Parks



# Parks Australia

## Climate Change Strategic Overview 2009-2014




# Parks Australia

## Climate Change Strategic Overview 2009-2014

### Background

Climate change is one of the greatest challenges ever to have faced the conservation of biodiversity and ecosystems. Climate change is expected to impact on the effectiveness of protected areas by exacerbating existing and more conventional threats and introducing new challenges for reserve managers in how they manage species, ecosystems, infrastructure and visitors.

The Director of National Parks is the statutory agency responsible for the Australian Government's protected area estate. Parks Australia is a division of the Australian Government Department of the Environment, Water, Heritage and the Arts that carries out the Director's responsibilities for managing the following terrestrial reserves:

- Kakadu National Park
- Uluru-Kata Tjuta National Park
- Christmas Island National Park
- Pulu Keeling National Park
- Booderee National Park
- Norfolk Island National Park and Botanic Garden
- Australian National Botanic Gardens.

The resilience of many ecosystems and botanic collections within the Parks Australia estate will be threatened over the course of the twenty-first century with approximately a quarter of all plant and animal species likely to be at increased risk of extinction if increases in global average temperature continue to match current projections (IPCC 2007).

The *Parks Australia Climate Change Strategic Overview 2009-2014* identifies the principles and objectives that will guide Parks Australia's response to managing the consequences of climate change in Parks Australia's terrestrial reserves over the next five years. This strategic overview is consistent with the Australian Government's climate change policy framework to reduce Australia's greenhouse gas emissions, help shape a global solution and adapt to climate change that we cannot avoid.

### Climate Change Projections

Current projections for Australia's climate indicate an increase in annual average temperature, increased incidence of hot days, fewer frosts, increased wind speeds and storm events, increased incidence of intense rainfall events and changes to seasonal rainfall patterns (Hyder Consulting Pty Ltd 2008). Projected changes that are likely to impact on the key values of Parks Australia's terrestrial reserves include:

#### Temperature

Relative to 1990, annual average temperatures are projected to increase by 0.4 to 2.0°C by 2030 and 1.0 to 6.0°C by 2070. The average number of days over 35°C is expected to increase.

#### Rainfall

While there is a wide range of uncertainty in future rainfall trends, most models project an increase in extreme daily rainfall, leading to more frequent heavy rainfall events. Eastern Australia has become drier since the 1950s while north-western areas have experienced an increase in summer monsoon rainfall.

**Storms and tropical cyclones**

Projections for tropical cyclones indicate modest to moderate increases in average and maximum cyclone intensities in some regions by the end of the century. The frequency of severe tropical cyclones (Categories 3, 4 and 5) are projected to increase in the east and north-east and their occurrence is expected to shift southward.

**Fire regimes**

The incidence and intensity of fires are projected to increase with warming temperatures and possible reductions in rainfall. Increases in atmospheric CO2 may increase plant growth in some vegetation types leading to increases in fuel loads (Hyder Consulting Pty Ltd 2008).

**Ocean changes**

Oceanic waters are expected to warm by 1 to 2°C by 2070. Warming oceans are expected to contribute to sea level rises of between 0.18 to 0.59 metres by 2100 (excluding uncertainties in carbon cycle feedbacks and the possibility of faster ice melts from Greenland and Antarctica) (IPCC 2007).

## Implications of Climate Change for Parks Australia's Terrestrial Reserves

The terrestrial reserves managed by Parks Australia cover a diversity of ecosystems from the dry sclerophyll heathland and woodlands of Booderee National Park to the savanna and wetland systems of Kakadu National Park. They range from the arid habitats of Uluṟu-Kata Tjuṯa National Park to the small oceanic islands of Norfolk Island, Christmas Island and Pulu Keeling National Parks.

Climate change over the past century has already impacted on species distribution and a shift in life cycle events such as flowering, reproduction and migration (Hyder Consulting Pty Ltd 2008).

Future implications of climate change that are common to all reserves include:

- changes in habitat availability impacting on dependent species (including threatened and endemic species)
- changes in abundance, distribution and composition of species including movement of species across reserve boundaries through an expansion of range
- increased pressure from weeds and introduced pest animals
- changes in traditional practices (fishing, hunting and gathering) due to changes in flora and fauna distribution
- intensification of erosive processes through increased rainfall, temperatures and extreme weather events
- increased park closures in response to increases in temperature, fire risk and extreme events (with implications for visitor safety, satisfaction and park revenue)
- increased expenditure on maintenance of infrastructure.

## Guiding Principles

To effectively manage protected areas into the future, it will be essential to adapt management activities to account for changing climatic conditions. Given the uncertainties surrounding the costs and benefits of climate change, management adaptation will be an ongoing process. Difficult decisions may be needed regarding the maintenance of existing values as well as acknowledging the likelihood that some of these values may be substantially, and in some cases irrevocably, changed.

The principles outlined below are consistent with the management actions and policies outlined in the management plans for each of the Parks Australia terrestrial reserves.

Parks Australia's overall approach to managing its protected areas in the face of climate change will be guided by the following principles:

- Applying knowledge-based decision making, recognising and valuing both scientific and traditional knowledge.
- Implementing adaptive management of key values in light of changing environmental conditions and threats over time, including a risk assessment approach in developing key management responses.
- Aiming to minimise genetic loss and to maintain species and habitat diversity.
- Working with stakeholders to develop whole-of-landscape strategies to protect core habitats and address key threatening processes.
- Managing key values within a landscape context, in partnership with key stakeholders, to maintain ecological connectivity where feasible.
- Clearly communicating management objectives to management partners and key stakeholders to encourage their engagement and support.
- Monitoring success in achieving management outcomes and sharing this information with management partners and key stakeholders.

## Objectives

Parks Australia will develop and implement management strategies to address the following five objectives:

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.

**Objective 1: To understand the implications of climate change**

A good knowledge of the potential impact of climate change is necessary to enable us to prepare and implement effective response options. Given the uncertainties of climate change, and our current knowledge gaps, the task of improving our understanding will be an on-going effort. Knowledge includes an understanding of the state of our parks and reserves, understanding how various landscape elements may respond to changing conditions, and designing research and monitoring programs that inform management responses. In order to adapt management responses to climate change we will need the background knowledge and robust processes to make decisions in response to changed conditions. This may involve preparing ourselves to make difficult decisions about managing to maintain existing values, or managing for changed values.

***Our strategies are:***

- to identify information gaps in our understanding of the potential implications of climate change on biodiversity and cultural values, ex-situ collections, park communities, visitors and infrastructure
- to improve our understanding of the ecological, social and economic factors in developing management responses to climate change
- to build capacity in climate change science and knowledge by working with scientists, traditional owners and other agencies
- to develop robust and well-designed monitoring programs that detect changes in key values and inform appropriate management responses.

**Objective 2: To implement adaptation measures to maximise the resilience of our reserves**

A key focus of the work of Parks Australia is the maintenance of biodiversity and functioning ecosystems, and the maintenance of cultural landscapes. Much of our effort is reducing impacts from a range of sources to enable ecological and evolutionary processes to continue, and for species and communities to remain viable. Climate change adds an additional pressure on species, communities and cultural elements.

***Our strategies are:***

- to reduce existing threats to biodiversity and to build resilience in natural systems and species, particularly those likely to be at increased risk under changed climatic conditions
- to work with neighbours and stakeholders to manage protected areas as part of the broader landscape to maximise opportunities for natural dispersal or establishment of species
- to assist the natural adaptation of species and ecosystems through improved on-reserve and off-reserve management of areas of high conservation value
- to incorporate climate change information into management tools for Park staff involved in management of natural and cultural resources
- to continue to develop a comprehensive, adequate and representative National Reserve System which incorporates adaptation to the impacts of climate change.

**Objective 3: To reduce the carbon footprint of our reserves**

In the course of managing the Parks Australia estate and our other responsibilities, activities such as transport, electricity use, development of new infrastructure and waste all contribute to our carbon footprint. In addition, land management activities such as fire management and revegetation projects have implications for the carbon cycle. Careful management of all these activities can help to reduce overall emissions and help to reduce carbon loss.

***Our strategies are:***

- to improve our understanding of our own contributions to the carbon cycle
- to develop strategies that minimise our contribution to greenhouse gas emissions
- to investigate the use of alternative energy technology in park management operations
- to investigate how certain management activities might contribute to emission offsets.

**Objective 4: To work with communities, industries and stakeholders to mitigate and adapt to climate change**

There are many communities and businesses (particularly in the tourism sector) that rely on our protected areas to attract tourists. Communities also rely on our protected areas to provide a range of ecosystem services. To effectively manage our protected areas in the face of changing climatic conditions, we will need to progressively adapt our management activities in partnership with relevant communities, industries and stakeholders. Climate change will have an impact on the tourism sector and these industries and stakeholders will need to adapt to minimise the impacts of the changes.

***Our strategies are:***

- to support local communities and stakeholders to develop strategies to adapt to unavoidable climate change
- to assist relevant industries in identifying and adopting market-based incentives to reduce their carbon footprint
- to implement effective disaster management planning in partnership with local communities and stakeholders.

**Objective 5: To communicate the implications of, and our management response to, climate change**

As climate change is a global issue affecting all aspects of our community, it is vital we share our knowledge with stakeholders, government bodies and the general public to help create awareness of the issues, assist in directing efforts in climate change research to priority areas, and articulate management directions we are taking.

***Our strategies are:***

- to ensure local communities are informed about potential climate change implications
- to communicate the state of our reserves and the management activities being implemented to mitigate and adapt to climate change to stakeholders and the general public
- to co-ordinate our efforts in engaging with government and scientific activities related to climate change.

## Implementation and Review

The *Parks Australia Climate Change Strategic Overview 2009-2014* is to be implemented over a five year period. The Strategic Overview is consistent with the directions of the management plans for Parks Australia's terrestrial reserves and *Australia's Strategy for the National Reserve System 2009-2030*.

Implementation of this Strategic Overview is subject to budgetary and resource constraints.

The Strategic Overview will be reviewed on a rolling basis and amended as required to take account of new information or changes in policy directions.

## References:


- Dunlop, M. & Brown, P.R. 2008. *Implications of climate change for Australia's National Reserve System: A preliminary assessment.* Report to the Department of Climate Change, February 2008. Department of Climate Change, Canberra, Australia.
- Hyder Consulting Pty Ltd 2008. *The Impacts and Management Implications of Climate Change for the Australian Government's Protected Areas.* A report to the Department of the Environment, Water, Heritage and the Arts and the Department of Climate Change. Department of Climate Change, Canberra, Australia.
- Intergovernmental Panel on Climate Change (IPCC) 2007. *Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.* IPCC, Geneva,Switzerland.



Prepared by: Director of National Parks




Note: This overarching Strategic Overview sets out the guiding principles and objectives that will guide Parks Australia's response to managing the consequences of climate change throughout the Parks Australia estate. Proposed objectives and indicative strategies may be subject to modification due to changes in knowledge or policy direction.

This plan should be cited as:

Director of National Parks 2009. *Parks Australia Climate Change Strategic Overview 2009-2014*. Commonwealth of Australia, Canberra, Australia.

This Strategic Overview is available online at: **environment.gov.au/parks/climate.html**

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