

## 5. Looking after country and culture

**Kakadu National Park is a living cultural landscape. There is a strong relationship between Bininj and country, ongoing traditions, cultural practices, beliefs and knowledge. This living Aboriginal culture in Kakadu is diverse and many clans look after and speak for different areas of country. Management and use of the land by past and present generations of Bininj has helped to shape the landscapes we see today. These landscapes are biologically rich, with a range and concentration of species matched in few other places. Maintaining healthy landscapes will help to maintain the World Heritage recognised conservation values of the Park, and the community of traditional owners.**

**Bininj will guide and be involved in all aspects of the management of cultural heritage, including protecting rock art sites and sacred sites.**

**Bininj and Parks Australia will work together, sharing knowledge, to look after country through proper fire management, and management of weeds and feral animals. Bininj's right to use the country for customary purposes will continue, and opportunities for Bininj to gain economic benefits from country through sustainable use of wildlife will be explored.**

**Opportunities for younger generations of Bininj to gain knowledge about and be involved in caring for country will be a priority in all these activities.**

*'Bininj culture really strong.....very strong for us Bininj. When I was a girl my grandmother, I learn. Same thing I do with younger generation. You have to look after country, for your grandfather country, like mother country, take care.'*

*Yvonne Margarula, Mirrar clan*

### 5.1 Bininj cultural heritage management

#### **Our aim**

Bininj cultural heritage is protected and maintained and Bininj guide its management and use.

#### **Measuring how well we are meeting our aim**

- Extent to which Bininj are actively involved in protecting and maintaining cultural heritage
- Condition of and access to cultural materials through proper storage and access protocols

#### **Background**

Kakadu represents a continuing cultural tradition thought to be linked to the earliest known occupation of Australia. The different landscapes within the Park have been occupied and actively managed by many generations of Bininj, and strong spiritual associations and interactions between Bininj and country continue today.

The tangible aspects of Bininj cultural heritage such as artefacts, rock art sites and other cultural sites are well known. However, Bininj cultural heritage also includes detailed

knowledge of beliefs regarding the creation era, plants, animals, landscapes, fire, languages, seasonal changes, traditional skills and the history of the Kakadu region.

For many years, the primary focus of cultural heritage management work in the Park has been the management of the tangible aspects of Bininj culture, in particular the protection of rock art sites. While this work is important to Bininj, they would like more resources and priority given to managing the intangible aspects of their culture. At the request of Bininj, more resources have been committed to recording aspects of Bininj knowledge. This includes recording and storing many of the region's place names, creation stories, information on plant and animal resource use and personal oral histories of some senior Bininj. Some of this information has been incorporated into Park interpretation materials. Since the Park was declared, researchers and educational institutions have also documented a number of the local Aboriginal languages.

The cultural heritage of Kakadu also includes Balanda use and occupation of the landscape. Protecting this heritage is important for Bininj and Balanda. There are many historic sites in the Park associated with land uses such as pastoralism, mining and tourism. Some of the people associated with these and other activities, such as buffalo and crocodile harvesting, are alive today and have detailed local historical knowledge of the Kakadu region and previous interactions between Bininj and Balanda.

Some Bininj artefacts have been returned to the Park from museums. If museums are prepared to return items to the Park, they will generally only do so if they can be sure that these items can be stored in ways that meet museum standards.

The cultural heritage values of the Park are recognised as being of international significance through the World Heritage listing of the Park. The lease agreements require the Director to fulfil specific requirements relating to the protection and maintenance of Bininj cultural heritage. Refer to Appendix B for a full description of the World Heritage cultural criteria of the Park.

During the life of the previous Plan, a Bininj cultural heritage workshop was conducted in Kakadu and a review of Indigenous cultural and intellectual property issues was undertaken.

### **Issues**

- Bininj want to be able to guide decisions about the cultural heritage management programs and priorities in the Park and to protect their cultural knowledge and materials. Bininj also want to make sure that there is culturally appropriate access to cultural materials and to have somewhere that materials are safely stored and can be viewed in private.
- Bininj want to ensure that their customary skills and knowledge are used in the management of the Park. They also want their knowledge to be passed on to younger Bininj.
- During the recent past, many Bininj and Balanda who have important knowledge about country and historical land uses within the Kakadu region have passed away. It is important that the documentation of oral histories, in particular of elderly Bininj, continues as a matter of urgency.

## **What we are going to do**

### ***Policies***

- 5.1.1 In accordance with this Plan and the lease agreements, the Director will support Bininj, through training and resourcing, with guiding the management of cultural heritage resources and programs within the Park.
- 5.1.2 Maintaining and developing Bininj cultural knowledge and skills will be recognised as important Park work by:
- applying Bininj knowledge, skills and priorities in the development and implementation of natural and cultural heritage management programs.
  - recognising cultural knowledge and skill development as important components of staff development.
- 5.1.3 The use of Bininj languages and language training will be supported and encouraged in the Park.
- 5.1.4 As appropriate and subject to Bininj approval, Balanda place names used in the Park will be replaced with local Bininj place names.

### ***Actions***

- 5.1.5 Develop strategies to help protect, and support Bininj to guide the use and management of, their cultural material and knowledge. These strategies will include:
- protecting knowledge from inappropriate use, including providing public education about issues of concern to Bininj
  - developing access, storage and usage protocols and systems for materials (including oral history materials) held by the Director
  - providing private areas where Bininj can view materials.
- 5.1.6 Work with Bininj, museums and other organisations to facilitate return of cultural materials to the Park from museums, if requested by Bininj.
- 5.1.7 Establish and implement strategies to facilitate Bininj independently managing cultural heritage maintenance activities, including the documenting of cultural knowledge. Make opportunities to involve young Bininj in these activities.
- 5.1.8 Facilitate on-country activities to encourage intergenerational transfer of knowledge between elders and the younger Bininj generation.
- 5.1.9 Provide resources for recording the knowledge and life histories of elderly or frail Bininj and other people identified by Bininj, including Balanda.

## **5.2 Aboriginal sites of significance**

### **Our aim**

Through working with Bininj, Aboriginal sites of significance are protected and maintained.

### **Measuring how well we are meeting our aim**

- Extent of Bininj participation in the planning and management of sites of significance
- Adequacy of inventories of cultural sites
- Level of compliance with relevant legislation and Bininj protocols regarding access to Aboriginal sites of significance
- Degree to which sickness country protocols are implemented

## **Background**

There are several kinds of sites and places within the Park that are especially significant to Bininj. These sites reflect and express Aboriginal cultural beliefs and practices. They include areas that relate to the activities that took place during the creation era and the travels of *Nayuhyunggi* (Gundjeihmi language), the first people. They may also include significant rock art and occupation sites. Access to sites of significance is often restricted in accordance with Bininj cultural practices. Restrictions vary between sites and may be based on social position and knowledge of ceremonies and rituals relevant to the site. Some sites are considered dangerous places.

Ceremonial areas and other sites of special significance to Bininj are located throughout the Park. A register of many of these sites has been established in consultation with Bininj, the Aboriginal Areas Protection Authority and the NLC.

The Land Rights Act and the *Northern Territory Aboriginal Sacred Sites Act* (NT) (Sacred Sites Act) provide formal legal protection for sacred sites, defined as sites that are sacred to Aboriginals or otherwise of significance according to Aboriginal tradition. The Sacred Sites Act applies in relation to Kakadu except to the extent that it is inconsistent with the EPBC Act.

A number of sites have been formally registered under the Sacred Sites Act by the Aboriginal Areas Protection Authority.

Sickness Country is a particularly important area of land that covers over 2000 square kilometres of country within the southern area of the Park (see Annexure A to Appendix A). Bula is a major figure associated with the creation era and whose essence is now located within Sickness Country. It is said that Bula is linked with a number of focal sites within the Sickness Country, that there are spheres of influence around these focal points, that these sites are interconnected, and that if Bula is disturbed, then the result would be catastrophic for all. The Bula tradition has been well documented and both the Bula tradition and implications for managing the Sickness Country are outlined in the report of the Resource Assessment Commission Inquiry into the Kakadu Conservation Zone (Resource Assessment Commission, 1991). Under Jawoyn cultural practices, strict rules and protocols relate to accessing and using the Sickness Country.

Special provisions regarding the management of Sickness Country are in the lease agreement with the Gunlom Aboriginal Land Trust. The Director is required to manage Sickness Country, particularly access, in line with the directions of Jawoyn traditional owners. Many roads and some culturally sites of significance within Sickness Country have been closed to public access.

## **Issues**

- Bininj want to be able to guide and make decisions about the management of sites of significance within the Park to fulfil and support the maintenance of cultural practices associated with site management.
- It is important to Bininj that only the right people enter certain sites in accordance with cultural practices and only culturally appropriate activities occur within the sites, including Sickness Country. Rules for accessing Sickness Country need to be made available for Park staff, researchers, visitors and Aboriginal people from other areas. It is important that rules on management of access to these sites are clear, respected and followed.
- There is also concern that without appropriate storage, some images (such as photographs and videos) of sites of significance have the potential to be viewed by people who are not properly authorised to do so under Aboriginal cultural practices. Many of these images

were recorded prior to the development of rules for the management of commercial filming and photography in the Park. This issue is addressed in Section 6.13, Filming, photography and audio recording (see also Section 5.1, Bininj cultural heritage management).

## **What we are going to do**

### ***Policies***

- 5.2.1 The Director will provide support to Bininj to guide how sites of significance are managed within the Park. Only those management actions that have been requested or approved, and guided by Bininj, will be implemented.
- 5.2.2 As far as practicable and subject to this management plan, sacred sites will be managed in accordance with the Sacred Sites Act.
- 5.2.3 Sickness Country will be managed in accordance with the provisions of the Gunlom Land Trust lease until protocols for Sickness Country are developed by traditional owners and the NLC.
- 5.2.4 Park staff will consult Bininj regarding the potential location of sites of significance when preparing development proposals or environmental impact assessments.
- 5.2.5 When requested by Bininj, Park staff will ensure that visiting researchers who wish to enter sites of significance are accompanied by appropriate Park staff and are aware of appropriate behaviour at such places.
- 5.2.6 Access to sites of significance may be restricted at the request of Bininj and the Director may restrict or prohibit access in accordance with EPBC Regulations (see Section 6.2, Access and site management).
- 5.2.7 Where appropriate and following consultation with Bininj, interpretive materials may be developed regarding sites of significance.

### ***Actions***

- 5.2.8 Maintain a register of sites of significance and develop access protocols in consultation with Bininj and in accordance with relevant Northern Territory legislation.
- 5.2.9 Work with Bininj, NLC and Northern Territory Government agencies to develop protocols for accessing and managing sacred sites, including Sickness Country.
- 5.2.10 Provide resources and training if necessary, to support Bininj to manage cultural sites and landscapes, including undertaking site and visitor management and monitoring programs..
- 5.2.11 Where requested by relevant Jawoyn people, erect signs at appropriate locations highlighting the significance of Sickness Country and outlining access restrictions.

## **5.3 Rock art and archaeological sites**

### **Our aim**

Through working with Bininj, rock art and other archaeological sites are protected and conserved in a manner consistent with national and international obligations.

## **Measuring how well we are meeting our aim**

- Extent of Bininj participation in the planning and management of rock art and archaeological sites
- Condition of art and other archaeological sites as recorded through the maintenance reporting system

## **Background**

The rock art and other archaeological sites within Kakadu are sites of significance for Bininj as a strong association exists between these sites and their living traditions and beliefs. Rock art also provides a wealth of cultural knowledge by showing objects, animals and activities familiar to people today. The significance of these sites has been recognised internationally through the World Heritage listing of the Park.

Public access is provided to three major rock art sites within the Park at Burrunggui (Nourlangie Rock), Ubirr and Nanguluwurr. Walking tracks, boardwalks and interpretation materials have been provided at these sites. To assist in preventing vandalism, full-time surveillance is provided at Ubirr when the site is open to the public.

Other archaeological sites are numerous in Kakadu and they reflect how Bininj have managed the country over thousands of years. Sites include occupation deposits in rock shelters, quarries where stone material was extracted and processed for tool making, human burial sites, stone or bone arrangements, surface scatters of stone, and earth and shell mounds

## **Issues**

- It is important that Bininj play a lead role in determining priorities for rock art and other archaeological site management and research programs, and are actively involved in this work.
- Access to public rock art and archaeological sites needs to be managed carefully and information regarding the conservation requirements of these sites should be available for Park visitors.
- Serious physical damage to rock art may be caused by water flowing over the rock and removing pigment or depositing salts and minerals on the painted surface. Other damaging agents include vegetation, fire, mud building wasps, termites and people touching or placing graffiti on paintings. Feral animals may also damage archaeological sites.
- Bininj are concerned about visitors accessing some escarpment areas where there are many culturally sensitive areas including rock art sites.

## **What we are going to do**

### ***Policies***

- 5.3.1 Rock art and archaeological site conservation work will only be undertaken with the permission and involvement of Bininj.
- 5.3.2 No additional rock art or other archaeological sites will be opened for public access without the consent of Bininj.
- 5.3.3 Surveillance will be provided at public art sites as agreed with Bininj where there is a high risk of vandalism.

### ***Actions***

- 5.3.4 Develop, and review with Bininj, management measures that aim to minimise weathering, potential visitor impacts and other causes of damage to rock art and other

archaeological sites within the Park, taking into consideration national and international obligations and advice from relevant experts.

- 5.3.5 Develop with Bininj a system for recording information on, and monitoring condition of, rock art and archaeological sites and monitoring effectiveness of maintenance programs. Maintain information on a centralised database.
- 5.3.6 Consult with Bininj about access management and educational requirements for the Burrungui (Nourlangie Rock) and Nanguluwurr sites and develop and implement agreed actions.
- 5.3.7 Provide support for Bininj to assess, and record cultural knowledge associated with, rock art sites.

## **5.4 Historic sites**

### **Our aim**

Post-contact historic sites in Kakadu are adequately recorded and conserved.

### **Measuring how well we are meeting our aim**

- Condition of post-contact historic sites
- Extent of Bininj participation in planning and management of post-contact historic sites

### **Background**

The first documented sustained contact that Aboriginal people from the Alligator Rivers region had with non-Aboriginal people was with the Macassans during the late 17<sup>th</sup> century. Later, in 1818, British navigator Phillip King sailed up the South and East Alligator rivers but it was not until Port Essington was established on the Coburg Peninsula in 1838 and the explorer Ludwig Leichardt passed through Kakadu in 1845 that ongoing contact with Balanda occurred.

The history of the Kakadu region after the mid-1800s is characterised by small-scale ventures such as crocodile and buffalo shooting, logging, pastoralism and early tourism ventures, most of which were economically marginal. Many of these ventures involved cooperation between Bininj and Balanda, so historic sites often bring up strong feelings for Bininj about individuals and the past as they represent a way of life and use of country that has now gone.

Uranium mining has had a significant impact on Bininj within the Kakadu region. Activity was focused within the central and southern regions of the Park, with the last mining activity in the upper South Alligator valley and the adjacent section of the Katherine River occurring in the 1950s. The mines in the southern area of the Park ceased production in 1964.

All of these industries affected local Aboriginal populations and have left a range of historic sites in the Park. Several studies have been undertaken to document the significance of historic sites and recommendations have been developed regarding future site management.

The Australian International Council on Monuments and Sites (ICOMOS) Burra Charter for the conservation of heritage places forms the basis of the recommended approach for making decisions about heritage sites. Accordingly cultural significance assessments and conservation plans have been prepared for some historic sites within the Park.

## **Issues**

- There are often varying perceptions of the significance and values of historic sites among Bininj, Park staff and other stakeholders.
- Natural weathering processes, fire and termites have damaged and degraded many of the historic sites within the Park. Conservation work may include restricting access to some sites, maintaining protection from fire and working to stabilise existing structures. High costs are associated with implementing conservation work, such as stabilising the structural integrity of old infrastructure.
- Many sites contain asbestos products making occupational health and safety (OHS) and public safety important considerations.
- Some Bininj and people working in the tourism industry would like to see some of the historic sites appropriately promoted as places for visitors. Access to such sites will be managed in accordance with Section 6.2, Access and site management.

## **What we are going to do**

### ***Policies***

- 5.4.1 Bininj and relevant Northern Territory Government authorities will be consulted regarding site conservation plans. Management priorities will then be determined according to the level of significance that Bininj and relevant Balanda assign to particular historic sites, and whether it is possible and cost effective to implement management recommendations.
- 5.4.2 Management programs will include assessments of required stabilisation and protection works, OHS risks and recommended risk management procedures, appropriate visitor use and ways of minimising potential visitor impacts.
- 5.4.3 In consultation with Bininj, visitor facilities and interpretation materials may be developed at significant historic sites. The interpretation will include both Bininj and Balanda historical perspectives.

### ***Actions***

- 5.4.4 Maintain a register of historic sites and conservation work undertaken. Where appropriate, seek to have sites entered on to relevant Australian and Northern Territory Government registers and databases.
- 5.4.5 Implement management programs and conservation plans to protect and interpret historic sites in the Park, and to control public access and use.

## **5.5 Coastal management**

### **Our aim**

Through working with Bininj, the cultural and natural resources of the coastal and marine environment and islands within the Park are recognised, protected and maintained.

### **Measuring how well we are meeting our aim**

- Extent to which significant coastal and marine species are considered to have an acceptable conservation status
- Extent to which relevant actions in EPBC Act recovery plans for marine and coastal species, including turtles, are implemented
- Extent to which impacts from visitor use at Waldak Irrmbal (West Alligator Head) are within acceptable levels
- Extent of Bininj participation in planning and management of coastal and marine areas



## **Background**

The northern boundary of the Park follows the low water mark of the 120 kilometre stretch of coastline that separates the Park from the shallow waters of the Van Diemen Gulf. Gardangal (Field Island) and Djidbordu (Barron Island) are included within the Park. The marine environment seaward of the low water mark of the northern coastline and each of the islands is under the jurisdiction of the Northern Territory Government.

Coastal and marine areas are very significant to Bininj. Numerous sites of significance are located within and adjacent to the Park. Bininj continue to hunt and gather a wide range of coastal and marine plant and animal species such as yams, bush apples, peanut trees, marine turtles, a variety of fish and sting rays. The substantial cultural heritage values associated with the area include land interest associations, the names of some significant terrestrial and marine sites, creation stories and Bininj oral histories.

The intertidal zone provides important habitat within the regional context for a diversity of sedentary and migratory shore birds, many of which are listed under the EPBC Act and international conservation agreements. These include five species of marine turtles and the dugong. The Park also provides critical habitat for two endangered species of speartooth shark, one of which is endemic to the Park, and one vulnerable sawfish species. Mangrove and seagrass areas provide important breeding and nursery areas for a variety of fish, and seagrass areas surrounding Gardangal (Field Island) provide feeding areas and habitat for marine turtles and dugongs. The island also provides critical habitat for flatback turtles and is identified as a key monitoring site in the Recovery Plan for Marine Turtles in Australia (2003) made under the EPBC Act. Over 240 estuarine and coastal fish species have been identified within and adjacent to the Park.

Commercial fishing targeting barramundi, salmon and mud crabs occurred within the Park until 1989. Commercial fishing has not been allowed in the Park since that time. The number of commercial fishing operations along the Kakadu coastline has increased over the last eight years from two to seven as at 2004. Incidents of illegal fishing in the Park occur.

Waldak Irrmbal (West Alligator Head) is the only coastal section of the Park readily accessible by land during the dry season and is the focus for a number of recreational activities including boating, fishing, and coastal camping. This area is characterised by unpredictable weather, shifting sand banks and mudflats, and potentially dangerous wildlife such as crocodiles, sting rays, and marine stingers. A number of incidents involving boats and vehicles in the Waldak Irrmbal area have required emergency assistance from Park staff.

Over the last 10 years, there has been a significant increase in recreational boating and fishing activity along the Kakadu coastline. Activity is particularly high during neap tides at Waldak Irrmbal, Gardangal and in neighbouring waters. The West Alligator River is closed to fishing and boating access. Fishing in marine and coastal areas will be managed in accordance with Section 6.10 of this Plan.

The EPBC Act and the Land Rights Act, and the Park leases, provide for the continuation of traditional use of plant and animal resources within the Park. At the time of preparing this Plan no mining leases or exploration licences had been issued under the *Mining Act (NT)* in relation to marine areas adjacent to the Park.

## **Issues**

- Bininj want areas of cultural significance on the Park coastline and the adjacent marine areas, to be protected and managed in consistent ways.

- More information is required on distribution patterns, habitat types and general ecology of marine species within and adjacent to the Park boundary to ensure management of the marine habitat is appropriate (see Section 8.6, Research and monitoring).
- Potential threats to coastal areas and the marine area adjacent to Field and Barron islands include:
  - by-catch of non-target species (such as turtles and sharks)
  - overharvesting of particular target species eg barramundi and reef fish
  - climate change and sea level rise
  - oil spills and release of other contaminants (eg ballast containing introduced marine organisms) from vessels located adjacent to the Park boundary
  - inappropriate use of turtle habitat, including nesting and feeding grounds.
- Issues associated with visitor use at Waldak Irrmbal include overcrowding at the camping areas, off-road driving, rubbish, dumping of fish waste which increases the potential risk of crocodile interactions, and unauthorised boat launching at Middle Beach.
- There have been a number of incidents involving commercial fishing operators illegally netting within the Park.
- Regular monitoring and surveillance by Park staff is difficult due to the remoteness of the coastal area and there may be significant time delays in responding to incidents.
- Visitors need to be aware of potential safety risks and related Northern Territory boating regulations when accessing the marine and coastal areas.

## **What we are going to do**

### ***Policies***

- 5.5.1 Bininj will be involved in the management of the marine and coastal areas of the Park including undertaking research, and survey and monitoring programs.
- 5.5.2 The Director and the Board will work with relevant Northern Territory Government agencies and relevant traditional owners on the management of the marine and coastal environment adjacent to the Park.
- 5.5.3 Waldak Irrmbal will be managed to ensure:
- protection of sites of significance to Bininj
  - that impacts to the coastal habitat are contained and within acceptable levels
  - visitor enjoyment by all Park users consistent with the above
  - Park visitors use the site in as safe a manner as possible
  - land and sea access to and from the site is undertaken consistent with the above.
- This may include mechanisms for monitoring visitation to the area.

### ***Actions***

- 5.5.4 Prepare a site plan for Waldak Irrmbal with Bininj, and in consultation with stakeholders including the Amateur Fishermen's Association of the Northern Territory.
- 5.5.5 Undertake regular surveillance and law enforcement patrols along the northern Park boundary.
- 5.5.6 The Director will take a lead role in liaising and cooperating with the Northern Territory Government and other relevant stakeholders, including relevant traditional owners regarding the management of access to the Park, and improved management and protection of adjacent coastal and marine environments.
- 5.5.7 Implement relevant actions from EPBC Act recovery plans for marine and coastal species, including turtles.

- 5.5.8 Ensure pre-visit information for Kakadu includes information on safety and relevant regulations for boating and fishing in marine and coastal areas.

## 5.6 Landscapes, soils and water

### Our aim

The landscapes, soils and water systems of the Park are protected and priority eroded and disturbed areas are rehabilitated.

### Measuring how well we are meeting our aim

- Extent of areas rehabilitated in accordance with rehabilitation programs, including Gunlom Rehabilitation Plan
- Extent of salt water intrusion into significant freshwater wetlands
- Extent to which potable drinking water at Park facilities is in accordance with Australian Drinking Water Guidelines (2004 and later)
- Extent to which impacts on selected wetland sites from feral animals, visitor use and other factors are within acceptable levels

### Background

The land systems and communities in Kakadu include savannas, wetlands, floodplains, monsoon forests, the sandstone plateau and outliers, and tidal, coastal, aquatic and marine habitats (see Figure 4). Savanna is the most extensive habitat type, occupying more than 75 per cent of the Park, while mangroves and monsoon forests are the most fragile and restricted. The variety of landscape types are of such outstanding diversity and value that they are one of the reasons Kakadu was listed as a World Heritage property. Appendix B includes a description of Kakadu's World Heritage values.

The hydrology of the Park is characterised by the drainage systems of several major rivers, the reliable inundation of large areas of floodplain each wet season, wet season runoff carrying huge volumes of water into estuaries, subsequent draining of the floodplains and evaporation from persistent backswamps during the dry season. Most floodplain areas are under water for up to four months each wet season. As water levels drop, remaining water bodies become important as refuge areas for many animals and plants to survive in the dry season. Along the escarpment some of these water bodies have become popular destinations for visitors.

The condition of landscapes, soil and water are subject to change through natural processes, including tidal influences, flood, fire and wind, as well as through human activities such as introduction of feral animals and weeds, changed fire regimes, construction of roads and gravel pits, mining and extraction of groundwater.

Natural levees on the floodplains reduce the flow of salt water into freshwater areas. Slight changes in sea level, river shape, tidal flow, vegetation cover or landform can result in the entry of salt water into freshwater areas. This is known to change vegetation communities and impact on the availability of important traditional food resources such as magpie geese, barramundi and freshwater turtles. In the past, buffalo and boats have eroded some natural levee banks and salt water has moved in and killed trees. In some places, artificial dams and levees were built to replace and stabilise damaged levees. During the life of the 4<sup>th</sup> Management Plan, boat access restrictions were put in place to decrease the potential for salt water intrusion into the Yellow Water area.

Parks Australia undertakes regular water quality monitoring at ranger stations and camping areas. During the life of the previous Plan, *eriss* undertook research at plunge pools to

determine whether pollutants such as sunscreens were adversely affecting water quality. No adverse impacts were noted. In addition, the Jabiru Town Council monitors groundwater quality and consumption within Jabiru (see Section 7.1 Jabiru).

Section 387(1) of the EPBC Act provides that no mining operations be carried out in the Park. This does not prevent the activities listed in s.387(2) of the Act, which include development of Jabiru, transportation of minerals along specified roads and routes and construction of power lines, pipelines and water supplies. Three mining project areas were excluded from the area proclaimed as Park. The Ranger project area is the only one operational. Mining operations at Ranger may conclude during the life of this Plan but processing operations are likely to continue until at least 2014. ERA, the mine operator, is required by the authorisation for the mine under the Atomic Energy Act 1953 to return the landscapes at the Ranger site to environments similar to the adjacent areas of Kakadu National Park, this means that rehabilitation works at the Ranger site will be likely to continue for many years after the mine closes.

Previous uranium mining activity in the central and southern regions of the Park has left mine shafts, tailings, old tracks, and radiological contamination in some locations. Some rehabilitation work was undertaken in 1990 and 1994 in the southern part of the Park to close off old mine shafts and adits.

The lease between the Director and the Gunlom Aboriginal Land Trust (1995) requires development of a plan for environmental rehabilitation for Guratba (Coronation Hill) and other old uranium mine sites and associated workings within the land trust area. It further requires the Director to use best endeavours to implement the plan by the end of 2015. Some interim remediation work was carried out in 2000.

The Gunlom Rehabilitation Plan has been developed with the traditional owners and other stakeholders and relevant government agencies, including the NLC, Office of the Supervising Scientist, the Northern Territory Government Department responsible for mining, and the Australian Radiation Protection and Nuclear Safety Agency (a licence is held under the *Australian Radiation Protection and Nuclear Safety Act 1998* in relation to the project). The rehabilitation plan is in two parts, covering sites with no or only minor radiological contamination, and those that have significant/complex radiological contamination.

In 2006 the Australian Government allocated \$7.3 million to implement the Gunlom Rehabilitation Plan and committed to incorporate the 29 mine leases in the Trust area into the Park, adding some 466 hectares to the Park. Figure 5 shows the location of areas requiring rehabilitation.

Section 354 of the EPBC Act states that an excavation must not be carried out unless in accordance with a management plan, and Regulation 12.16 of the EPBC Regulations prohibits fossicking, and introduction, disturbance or removal of minerals, clay, sand, stone or other earth materials, unless undertaken in accordance with this Plan or with the approval of the Director.

The Kakadu Land Rehabilitation Strategy was prepared in 1995, and mainly addressed old gravel pits located across the Park. It has not yet been fully implemented.

#### **Climate change:**

In recent years global warming and its implications for climate change has emerged as a key issue for biodiversity and environmental management on a global scale. In the Arnhem/Kakadu region, the predicted effects of climate change as a result of global warming

include a rise in temperature, variation in rainfall patterns and amount, rising sea levels and changes in climate variability.

Some of the potential management implications in the Arnhem Land/Kakadu region are;

**Biodiversity:** Loss of some critical habitats (including freshwater wetlands), changes in the abundance and distribution of some animal and plant species and an increased risk in the spread of exotic plant and animal species.

**Water resources:** Potential increase in drought and flood activity; reduction of inland and coastal water quality and saltwater intrusion into surface and groundwater resources.

**Extreme weather:** Increased frequency of extreme heat days and rainfall events and an increase in the intensity of tropical cyclones.

**Fire:** Changed fire regimes

**Bininj use of the Park:** possible changes in access to hunting areas and changes in abundance of foods;

**Human health:** Increase in heat related illness; expansion of mosquito born viruses and an increase in injuries from extreme weather events.

**Buildings and Infrastructure:** Increased infrastructure maintenance costs and the need to relocate infrastructure from high risk areas.

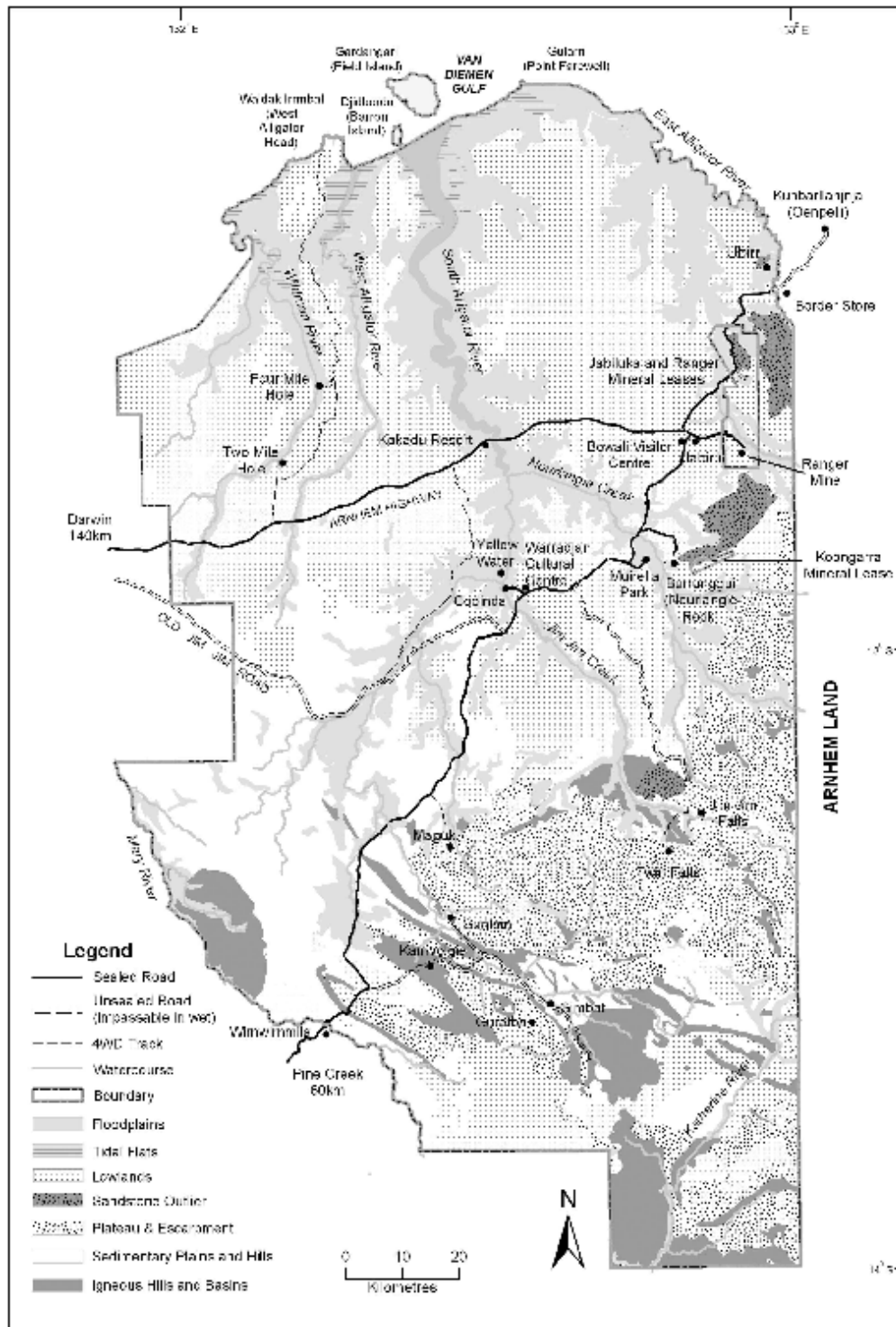
In the life of the 4<sup>th</sup> Plan a range of landscape and biodiversity monitoring/research programs were conducted including, fire plot monitoring and landscape change research. These and other similar programs provide valuable baseline data to detect landscape and biodiversity changes in the Park and may assist to monitor climate change impacts in the future.

In 2006, the Director of National Parks commissioned a study of the potential implications for climate change for management of Commonwealth reserves, including Kakadu. The results of this investigation will contribute to an improved understanding of and preparedness for changing conditions in Kakadu.

### Issues

- A better understanding is needed of the different influences on landscape change in order to make decisions about levels and types of change that are within acceptable limits.
- Global climate change may have a range of impacts on the Park's natural and cultural resources, infrastructure and tourism value and opportunities. Bininj use of the Park may also be affected. Up to date expert information will continue to be needed to assess impacts and the risks of climate change, identify environmental monitoring indicators and to identify adaptive management measures to mitigate its impacts where possible.
- As many small developments and clearings may, over time, have a large cumulative impact on the structure and function of landscapes, the landscape needs to be considered as a whole when planning and managing local developments and activities or undertaking rehabilitation and protection works.
- To more effectively undertake rehabilitation and protection measures, more needs to be known about how factors such as fire, weeds, feral animal impacts and floods interact in influencing the landscape during the different seasons and how their effects vary across different landscape types and vegetation communities.
- There is a serious shortage of gravel in some areas of the Park.
- Many sites in the Park that have been cleared and disturbed by mining, for roads or, more recently, for gravel pits, have yet to be rehabilitated or revegetated. Gravel pits cause local environmental damage, are costly to rehabilitate and scar the landscape. Erosion at some visitor sites and along roads and tracks requires stabilisation and revegetation. (Road access and management of roads in the Park are covered in Section 6.3 of this Plan.) Unrehabilitated areas of disturbance remain vulnerable to weed establishment.

**Figure 4 – Landforms**



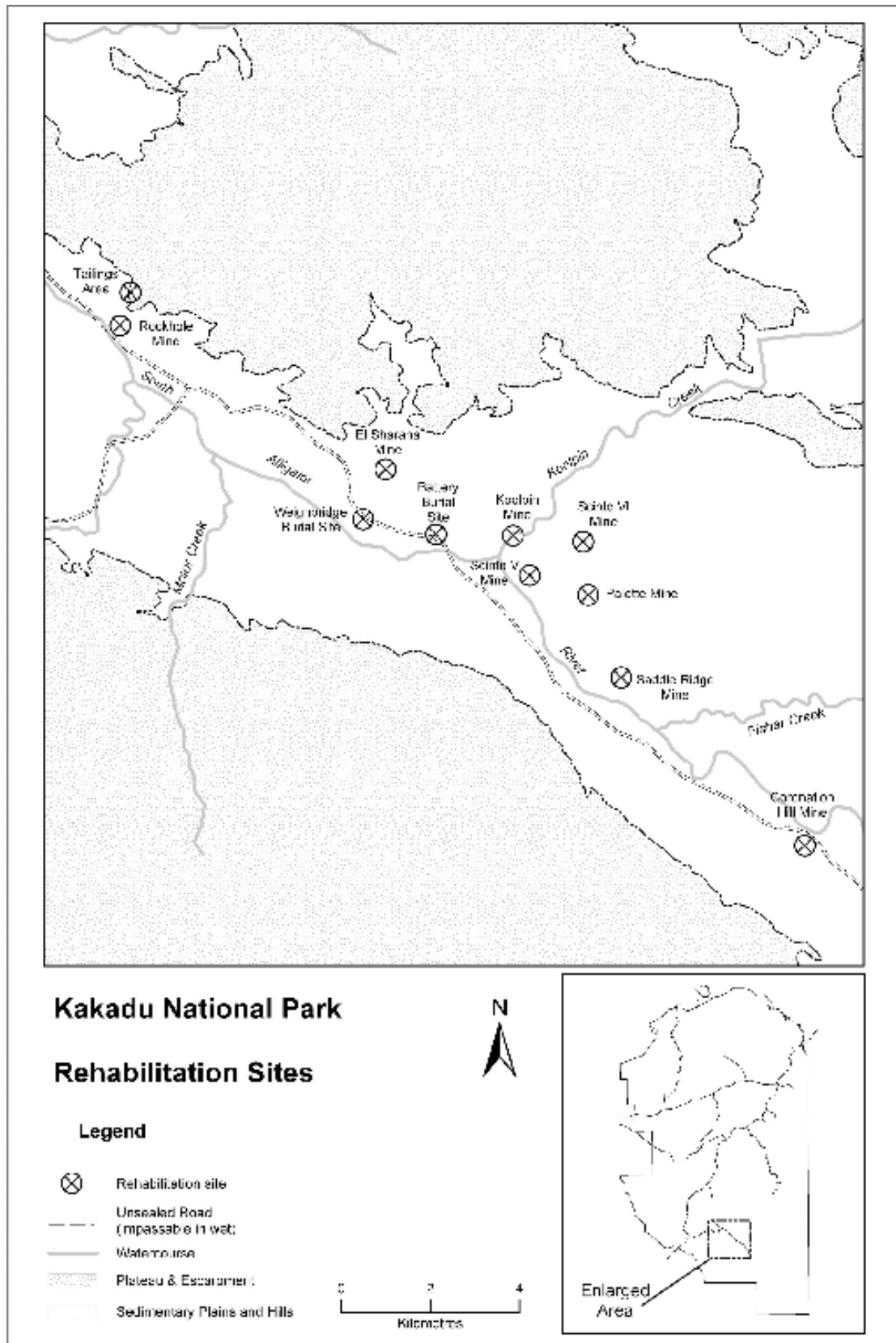
- There is a potential risk of altering local genetic stock, in addition to introducing pests in soil brought in with plants, if plant material is sourced from outside the Park for revegetation purposes. (see Section 5.11 for discussion on introducing vegetation).
- Some groundwater resources are unsuitable or of limited use for people due to naturally occurring contaminants including uranium, arsenic and high salt levels. The availability of suitable potable water supplies is an issue at some ranger stations and campgrounds. Groundwater could become contaminated over time due to leaching from rubbish dumps and from pit, composting and septic toilets if these are not properly managed (see Section 8.7, Resource use in Park operations). Groundwater can be depleted through heavy use, causing localised impacts on wildlife populations.

## **What we are going to do**

### *Policies*

- 5.6.1 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.
- 5.6.2 Bininj involvement in rehabilitation work, including preference for Bininj organisations in contractual arrangements, will be encouraged and facilitated.
- 5.6.3 Collecting rock and soil samples may be permitted for scientific research only, subject to the conditions specified in Section 8.6 of this Plan and provided that the research is not for the purpose of mining operations in the Park.
- 5.6.4 Excavation of sand and gravel from within the Park will be allowed for Park management purposes, including mine rehabilitation in the Gunlom Land Trust area.
- 5.6.5 Rock, soil, sand, mulch or other similar materials may be brought into, or transported through, the Park in accordance with a permit issued by the Director. Import of sterilised potting mix for non-commercial purposes will not require a permit, and import for commercial purposes may occur with the approval of the Park Manager.
- 5.6.6 Plants or seeds may be brought into the Park, for revegetation or other purposes, if required to maintain genetic viability or if there is no suitable stock within the Park, in accordance with a permit issued by the Director (see also Section 5.8, Native plants and animals).
- 5.6.7 Plants and seeds for rehabilitation programs and for the use of residents of Jabiru and lease areas should be locally sourced where possible.
- 5.6.8 When and if required, the Director may commission the development of new bore sites to address water quality issues.
- 5.6.9 The Director will work closely with the Supervising Scientist and ERA to ensure the Board has access to advice about management of mining operations, in particular in relation to those activities that may potentially impact on Park values or the health of residents.
- 5.6.10 An integrated approach will be taken in managing landscape management issues, such as fire, ferals and weeds in the various habitats in Kakadu (see also Section 7.2 Neighbours, stakeholders and partnerships).

**Figure 5 – Mine rehabilitation sites**





## **Actions**

- 5.6.11 Obtain expert engineering and environmental advice on measures needed to protect significant freshwater habitats from salt water intrusion. Work with Bininj and stakeholders to make decisions about the need for intervention and the choice of available options.
- 5.6.12 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 (see Section 8.6, Research and monitoring).
- 5.6.13 Work with relevant experts and stakeholders to investigate climate change impacts and consider, and where possible implement, appropriate actions and responses.
- 5.6.14 Consult Bininj regarding rehabilitation priorities for gravel pits and other sites identified in the Kakadu Land Rehabilitation Strategy (Murray 1995) and undertake works on priority areas. Priorities will be set considering EPBC Act listed plants and animals or significant communities (such as monsoon forest), or areas that are subject to active rapid erosion. Update the strategy at least once during the life of the Plan.
- 5.6.15 Establish and implement a program of testing and monitoring potable water supplies for Park facilities (staff and visitor), in accordance with the Australian Drinking Water Guidelines (2004 and later).
- 5.6.16 The Director will take all reasonable steps to complete and implement the Gunlom Rehabilitation Plan.

## **5.7 Fire**

### **Our aim**

Through working with Bininj in the active management and use of fire, the natural and cultural values of the Park are maintained, and life and property are protected.

### **Measuring how well we are meeting our aim**

- Bininj satisfaction with how well country is being looked after through management of fire, and how much involvement they have in fire management programs
- Trends in species diversity and abundance of important or indicator species at fire monitoring plots
- Proportion of Park area affected by unplanned or adverse fires
- Number and type of incidents associated with the loss of life or property due to fire

### **Background**

Fire is one of the major forces that influence the highly fire prone environments of northern Australia and is considered to be one of the few tools that managers possess to actively influence the dynamics of savanna landscapes (Edwards *et al.* 2003).

Bininj have always used, and continue to use, fire as an important tool for managing and expressing ownership of country. Fire was used to make it easier to travel, for communication, for defence and to clear an area of pests (Braithwaite and Roberts 1995). Fire is also used when hunting to enable Bininj to see and flush out animals. Fire and smoke are important in rituals and purification ceremonies.

The traditional fire regime practised by Bininj created a mosaic of unburnt, early and late burnt patches that is important for maintaining species and habitat diversity (Russell-Smith 1995). However, subsequent Balanda occupation of the land resulted in a reduction and redistribution in the Bininj population, causing the traditional ways of burning country to be severely disrupted. With the arrival of pastoralism, fires tended to be lit mainly in areas favoured by grazing water buffalo such as the floodplains and adjacent lowlands. The introduction of exotic pasture grasses (such as gamba and mission grass) and the removal of water buffalo in the 1980s also caused changes to the intensity and frequency of fires, particularly within wetland areas and woodland margins. Due to these changes, the fine mosaic of burnt and unburnt patches that had previously protected country from damaging late season fires, and that provided optimum conditions for maintaining species abundance and diversity, was lost. As a result, extensive fires in the late dry season became more common.

The ongoing, active management of the landscape by Aboriginal people through the use of fire, including fire-assisted hunting and the creation of environmental mosaics, provides an important example of people's interaction with the environment. This is one of the values for which Kakadu is inscribed on the World Heritage List (see Appendix B, World Heritage attributes of Kakadu National Park). A number of specific clan-based projects have been established with Parks Australia support, with the aims of maintaining customary Aboriginal burning practices and actively managing certain habitat types and particular areas, engaging young people in 'caring for country', and sharing traditional and scientific knowledge of country.

Since the proclamation of the Park, fire management 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.

While savanna burning is the highest contributor of greenhouse gas emissions in the Northern Territory, the Parks approach to fire management may help reduce greenhouse gas emissions. Scientific evidence indicates that greenhouse gas emissions from low intensity fires that typically occur in the Park during the relatively benign early dry season fire weather conditions, are substantially less than those produced from intense fires more typical of late dry season fires.

In some areas of the Park, wet season burning has also been used as a tool to reduce the amount of sorghum fuel loads. Staff consult Bininj each year about burning regimes for different parts of the Park.

Since 1980, the fire history of the Park has been well documented by the Northern Territory Bushfires Council through the maintenance of a GIS that is based on the interpretation of satellite imagery. The location and numbers of the different types of plants and animals at permanent fire monitoring plots are also routinely recorded. These have been established in a range of vegetation and community types within the Park. Since the 1980s substantial improvements in landscape heterogeneity have been documented as a result of fire management programs.

The *Bushfires Act* (NT) applies to Kakadu in so far as it is not inconsistent with the EPBC Act, this Plan, or the EPBC Regulations.

Fire management for life and property protection is mostly confined to smaller areas adjacent to settlements and other infrastructure and does not necessarily conflict with use of different fire regimes to maintain biological values.

## **Issues**

- It is important to Bininj that they are involved in the development of fire management programs to ensure that their views regarding how country should be burnt are incorporated. It is also important for Bininj to be actively involved in implementing and reviewing the outcomes of fire management programs.
- Aboriginal sites of significance and historic sites need to be appropriately protected from fire.
- Some plant and animal communities depend on fire for maintenance of optimum habitat conditions
- Some communities and plant species are recognised as being particularly vulnerable to frequent, intense fires. These include all rainforest communities, slow growing heath communities of the sandstone plateau and escarpment, cypress pine thickets, bamboo thickets, and mature floodplain paperbark forests.
- The introduction of some exotic pasture grasses such as gamba grass, mission grass, olive hymenachne and para grass has resulted in changes to fire regimes within some areas of the Park. Better understanding is required of the effects of weeds on fire regimes and the effects of fire on weed distribution and abundance.
- Unplanned large late season fires continue to be an issue in some areas of the Park, in particular within the sandstone country where fires enter the Park from the western rim of the Arnhem Plateau. It is important that the boundary areas of the Park are well managed to reduce the risk of unplanned fires entering or spreading from the Park.
- Better understanding is required of the role and acceptability of wet season burning as a tool for reducing native sorghum abundance and promoting development of other understorey communities.
- Fire management must be considered in a wider regional context, and close liaison with neighbours and regional organisations is essential.
- Research and long-term monitoring programs are essential to assess how effective fire management programs are in terms of meeting their objectives.
- Tour operators and visitors need to understand the use of fire as a land management tool and the wise use of fire at campgrounds.

## **What we are going to do**

### ***Policies***

- 5.7.1 Traditional burning practices will be recognised, and where possible incorporated, in the fire management programs for the Park.
- 5.7.2 Fire management will be carried out in accordance with long-term strategies prepared for each district or identified area. These strategies will reflect the decisions made on a clan area basis by Bininj. Strategies will:
- include desired cultural and biodiversity aims and outcomes identified by Bininj and Park staff
  - set targets for the extent and timing of burning that should be undertaken within different vegetation communities. This is especially important for those that are sensitive to frequent, intense fires and those sensitive to any fire
  - aim to minimise occurrence of unplanned fires, especially intense and large late dry season fires in habitat types that are sensitive to such fires
  - incorporate customary ways of burning country
  - include emergency response and fire protection plans for all Park assets
  - consider the ecological values of areas surrounding assets and recommend alternative actions to burning where required
  - be consistent with this Management Plan

- be subject to regular review in cooperation with Bininj.
- 5.7.3 Annual burning programs will be implemented to give effect to the district fire plans. Park staff and Bininj will regularly review annual fire plans.
- 5.7.4 Park staff may assist neighbours with hazard reduction and prescribed ecological burning on lands adjacent to Kakadu, and will cooperate in relevant regional forums.
- 5.7.5 Representation of nominated traditional owners on the West Arnhem Bushfire Committee will continue.
- 5.7.6 Fire management will be carried out in a manner consistent with the *Bushfires Act* (NT) so far as practicable. Permits may be applied for under the *Bushfires Act* to carry out fire management works.

### ***Actions***

- 5.7.7 Prepare and maintain fire management strategies and annual burning plans for all districts, in accordance with Policy 5.7.1.
- 5.7.8 Consistently document fire ignition points, weather conditions and outcomes.
- 5.7.9 Liaise with the Bushfires Council and with adjoining landholders who may be affected by particular fire management operations.
- 5.7.10 Monitor fire and its effects (see Section 8.6, Research and monitoring). Review results of monitoring programs at least annually and incorporate any lessons learnt into subsequent burning programs.
- 5.7.11 Improve understanding of the effects of weeds on fire regimes and the effects of fire on weed distribution through monitoring and research (see Section 8.6, Research and monitoring).
- 5.7.12 Ensure Park staff are appropriately trained in the use of equipment, incendiaries, GIS and database management, monitoring techniques and OHS requirements relevant to fire.
- 5.7.13 Provide interpretive materials to tour operators and visitors on fire management programs and the wise use of fire at campgrounds.
- 5.7.14 Provide resources and support to engage Bininj in all aspects of fire management including, customary fire management programs.

## **5.8 Native plants and animals**

### **Our aim**

Through working with Bininj, ecological processes are maintained to ensure the viability of populations of native plants and animals currently occurring in Kakadu.

### **Measuring how well we are meeting our aim**

- Extent to which distribution and abundance of selected plants and animals are at acceptable levels
- Extent to which priorities in EPBC Act threat abatement and recovery plans are implemented
- Extent to which species important to Bininj's customary economy, ceremonial responsibilities and land management processes are available and accessible.

## **Background**

Bininj have been using and managing the land for thousands of generations, contributing to the structure and composition of plant and animal communities seen in Kakadu today. The arrival of Balanda caused dramatic changes to country within a relatively short period. Altered fire regimes and the spread of weeds and feral animals have influenced the composition of native plant and animal communities in the Park.

Under Aboriginal cultural tradition, plants and animals have a totemic role, linking clans and individuals with their estates and giving rights and responsibilities concerning particular country and its totemic figure. Rights in relation to plants and animals cover their roles as a food or other material resource and images of them are often depicted in rock art located throughout Kakadu.

Historically, Bininj have used, and continue to use, plants for bush tucker and medicines, and to make a variety of tools and implements. Bininj also hunt animals according to the seasons and the movement of people around their clan estates has always been determined by the condition of the wildlife. Some of the native animals most often hunted by Bininj include magpie geese, turtles, wallabies, fish, file snakes and goannas.

The many different types and numbers of native plants and animals in Kakadu is of national and international significance and is recognised in the Park's World Heritage listing. Significant plant and animal species include those listed as threatened under the EPBC Act, and many of these are restricted to certain habitat types. A substantial number of animal species are listed as either marine or migratory under the EPBC Act and are also subject to the provisions of international agreements and treaties (such as Ramsar, JAMBA and CAMBA). Significant species, as at 2005, are listed in Appendices D and E. Many other species may also be considered management priorities because of their restricted distribution, population size, susceptibility to certain threats, or cultural significance.

All major Top End habitats are represented within the Park. These include mangrove and samphire communities, lowland and escarpment rainforest, eucalyptus open forests and woodlands, melaleuca forests, and seasonal floodplains (Russell-Smith 1985). Nearly 1600 species of plants have been recorded within the Park, many of which are only found within the Alligator Rivers region.

Conserving the distribution, abundance and diversity of native plants and animals and communities is a fundamental objective of Kakadu National Park management. For the most effective approach to management of native plant and animal populations, land management programs must integrate fire, weed, feral animal and visitor management considerations. Current management programs designed to assist in the conservation of native plants and animals in Kakadu include:

- dedicated research projects to monitor plant and animal distribution and abundance and long-term changes in communities
- fire management, including undertaking controlled burns and monitoring and mapping fire impacts
- controlling weeds and feral animals
- compliance and enforcement effort to try to minimise the illegal take of animals, especially in relation to illegal commercial fishing and hunting activities
- minimising habitat clearing
- cooperating with Northern Territory and other agencies when undertaking research and monitoring programs.

Under s.354 of the EPBC Act, a person may not kill, injure, take, trade, keep or move a member of a native species except in accordance with a management plan. The EPBC

Regulations also prohibit taking animals and plants into the Park, and cultivating plants in the Park, except with the approval of the Director.

### **Issues**

- It is important that Bininj knowledge of native plant and animal communities is recognised, maintained and used in the management of plants and animals in the Park.
- There is evidence of decline in the abundance of some native plants and animals in Kakadu, and causes of these changes are often unclear.
- There is a need for updated information to guide management actions to address the potential threats to the range and numbers of the different native plants and animals within the Park (see also Section 8.6, Research and monitoring).
- Feral pigs, cats and cane toads have been formally recognised as threatening processes under the EPBC Act. All are present in the Park, creating particular management obligations.
- For many plants and animals there is not a clear understanding of the relationships between fire regimes and the changes in their range and numbers.
- Some plants and communities, such as *Callitris* communities, slow-growing heath in escarpment areas, bamboo thickets and monsoon forests, are sensitive to frequent or intense fires. There is evidence that the distribution of these communities has declined in some locations within Kakadu (see Section 5.7 of this Plan in relation to fire management).
- There is a need for regular monitoring to identify trends in the range and numbers of all EPBC Act and Northern Territory listed threatened plants and animals.
- Plant communities have not yet been mapped in sufficient detail for the whole Park. In particular, there is a need to map sandstone communities due to the high number of endemic or rare species present and fire sensitivity of some species.
- There are hazards associated with people undertaking recreational activities in and near waterways within the Park, particularly in relation to interaction with crocodiles. Due to increased population densities and prevalence of larger crocodiles, there is a greater risk of crocodile attack than in the past.
- In addition to crocodiles, other animals such as snakes, scorpions, stonefish and box jellyfish pose hazards to visitors.

### **What we are going to do**

#### ***Policies***

- 5.8.1 Bininj will continue to exercise their traditional and legal rights to fish and hunt native animals and gather plants and plant material within the Park (see also Section 4.3, Customary use of resources).
- 5.8.2 Bininj and Balanda knowledge of and priorities related to the management of native plants and animals and their habitats will be incorporated into management programs.
- 5.8.3 The Director will encourage and support Bininj to:
- be involved in research and surveys of native plants and animals
  - carry out land management work eg fire, weed and feral animal management, and record their knowledge of native plants and animals and their habitats.
- 5.8.4 Data on the location of EPBC Act and Northern Territory listed plant and animal species and others of conservation or cultural significance will be maintained and management programs and activities will ensure that they are protected from inappropriate disturbance.

- 5.8.5 Monitoring programs will be directed at indicator species identified in regard to major threats and management issues such as fire, weeds and feral animals (see Section 8.6, Research and monitoring).
- 5.8.6 The Director will support research and monitoring programs for EPBC Act and Northern Territory listed plants and animals, and others of conservation or cultural significance.
- 5.8.7 Crocodiles will be managed in accordance with the Park's Crocodile Management Policy to protect the natural abundance of crocodile populations and minimise the risks of crocodiles to people who visit and live in Kakadu through the following measures:
- educating and warning visitors, residents and tour operators about crocodiles
  - maintaining data on crocodile numbers, size and behaviour, particularly in waterways frequented by Park residents and visitors
  - assessing risks posed by crocodiles to people
  - endeavouring to detect and remove all estuarine crocodiles from any location where swimming is to be allowed
  - managing individual crocodiles in other locations that present a higher than usual risk to people
  - closing water bodies temporarily, seasonally or permanently if crocodiles present a high risk to visitors
  - ensuring that any take of crocodiles and eggs is undertaken legally (see Section 5.10, Commercial use of native wildlife)
  - ensuring that all staff involved in crocodile management are appropriately trained and experienced to carry out crocodile management activities.
- 5.8.8 Native animals and plants may be brought into the Park in accordance with a permit issued by the Director and where it is consistent with policies and actions in this Plan. Plants may be brought into leasehold areas and other occupancies in the Park with the Director's approval.
- 5.8.9 The Director may take actions concerning native species that are otherwise prohibited by the EPBC Act where they are necessary to implement this Plan, or where they are otherwise necessary for preserving or protecting the Park, protecting or conserving biodiversity, or protecting persons or property in the Park.
- 5.8.10 The Director will cooperate with Northern Territory management agencies in the protection of native plants and animals within the Kakadu region.
- 5.8.11 As appropriate, Park staff will continue to provide plant specimens from the Kakadu area to the Northern Territory Herbarium.
- 5.8.12 To minimise the risk of introducing diseases into the Park, people will not be allowed to take injured or orphaned animals out of the Park and then bring them back in except with the Director's approval.

### ***Actions***

- 5.8.13 Commence 1:25 000 mapping of vegetation communities across the Park. Give priority to sandstone communities.
- 5.8.14 Continue photo monitoring and surveys of plants and communities at reference sites across Kakadu commenced in 1994.
- 5.8.15 Implement relevant actions from species threat abatement and recovery plans.
- 5.8.16 Update the Park's database of EPBC Act listed species and species of conservation or cultural significance at least once every three years.

- 5.8.17 Implement the Park's Crocodile Management Policy, as updated from time to time, in consultation with Bininj.
- 5.8.18 Provide information to visitors about potentially dangerous animals in Kakadu, and ways to minimise risk.
- 5.8.19 Provide training to Park staff or authorised volunteers in techniques for capture, handling and rehabilitation of injured native animals.
- 5.8.20 Continue specific research into the longer-term impacts of the cane toad and potential natural recovery of animal populations such as the northern quoll and goannas.

## **5.9 Bioprospecting (access to biological resources)**

### **Our aim**

Access is provided to biological resources while ensuring Park values and the interests of the Director and Bininj are protected.

### **Measuring how well we are meeting our aim**

- Bininj are satisfied with benefit-sharing arrangements entered into for commercial access to biological resources

### **Background**

Access to biological resources (also known as bioprospecting) is the taking of biological resources of native species for research and development on any genetic resources, or biochemical compounds, comprising or contained in the biological resources.

Access to biological resources in Commonwealth areas, such as Kakadu, is regulated under the EPBC Act. Section 301 of the Act authorises regulations to be made to control the activity. 'Biological resources' are defined by the Act (s.528) as including genetic resources, organisms, parts of organisms, populations and any other biotic component of an ecosystem with actual or potential use or value for humanity. 'Genetic resources' are defined as any material of plant, animal, microbial or other origin that contains functional units of heredity and that has actual or potential value for humanity.

Part 8A of the EPBC Regulations is made under s.301 to regulate access to biological resources. Key features of Part 8A in relation to Kakadu are as follows:

- Any person who wants to access biological resources must obtain a permit from the Minister for the Environment and Heritage.
- The 'access provider' must agree to the taking of biological resources. The access provider for Aboriginal land in Kakadu is the relevant land trust, and for non-Aboriginal land it is the Director.
- Where access is sought for commercial purposes or potential commercial purposes:
  - there must be a benefit-sharing agreement with the relevant access provider
  - the benefit-sharing agreement must provide for reasonable benefit-sharing arrangements, including protection for, recognition of, and valuing of any Indigenous people's knowledge that is to be used
  - where access is sought to Aboriginal land in the Park the relevant land trust must give 'informed consent' to the benefit-sharing agreement, after the traditional owners of the land have been consulted and the views of the NLC obtained.
- Where access is sought for non-commercial purposes:
  - written permission must be obtained from the relevant access provider
  - a statutory declaration must be given to the access provider declaring, among other things, that any biological resources taken are not intended to be used for



commercial purposes, that a written report will be given to the access provider on the results of any research into the biological resources, that samples will not be given to other people (other than a specified research institution) without permission of the access provider, and that the person(s) given access will not carry out, or allow others to carry out, commercial research or development unless a benefit-sharing agreement is in place with the access provider.

- There must be an assessment of the environmental impact of the proposed access if it is likely to have more than negligible environmental impact.

Access to biological resources is also covered by s.354(1)(a) of the EPBC Act (if the resources are members of a native species), s.354(1)(f) (if access is for commercial purposes), and r.12.10 of the EPBC Regulations (if access is for scientific research).

### **Issues**

- There is a need to facilitate appropriate access to biological resources, and avoid duplication of processes.
- Relevant Bininj should benefit appropriately from access to bioprospecting activities in accordance with the EPBC Regulations.

### **What we are going to do**

#### ***Policies***

- 5.9.1 Access may be provided to biological resources in accordance with Part 8A of the EPBC Regulations.
- 5.9.2 Where access to Aboriginal land is proposed, written agreement from the Director is required in addition to a permit under Part 8A of the Regulations.
- 5.9.3 Where access to non-Aboriginal land is proposed, the Director will not enter into a benefit-sharing agreement for commercial access under Part 8A of the Regulations, or give permission for non-commercial access under Part 8A, unless Bininj have been consulted and agreed to the proposed access, and the views of the NLC have been obtained and considered.

## **5.10 Commercial use of native wildlife**

### **Our aim**

Economic benefit is gained by Bininj through the sustainable commercial use of native plants and animals for saleable art and craft, for bush tucker tours and other purposes in a manner consistent with Aboriginal cultural practices, World Heritage values, the Park leases and the IUCN management principles.

### **Measuring how well we are meeting our aim**

- Impacts on target species are within acceptable levels
- Extent to which wildlife based enterprises provide significant economic benefits to Bininj and make significant contributions to maintenance of the cultural values of the Park

### **Background**

The knowledge, use and management of plant and animal wildlife are central to Bininj culture. Hunting and gathering enables Bininj to be out on country and to maintain customary traditions. Bininj have been collecting small amounts of native wildlife for commercial return for many years. Various forms of artwork such as paintings, didgeridoos and weavings have

been made from plant materials and the production of artwork has become an important industry for Aboriginal people in the Kakadu region.

Kakadu National Park includes the estate and the resource base of a number of Aboriginal clan groups and families and the Park is a major contributor to their economic future. The ability for traditional owners to derive benefit from enterprises established in the Park is recognised in the IUCN management principles for the Park (see Section 3.1, IUCN category).

Bininj, as well as Balanda from outside the Park, have shown interest in other types of commercial use of wildlife. Proposals have included harvesting bush tucker for sale, harvesting crocodile eggs for sale to crocodile farms and capturing live fish for sale to aquariums and pet shops.

There is a large set of Aboriginal cultural practices related to the management and use of wildlife. These determine who should be asked for permission to take plants and animals in each area and include rules about how much can be taken and at what times of year.

The Board of Management, while actively supporting Bininj in being able to benefit economically from Kakadu, has emphasised that protection and appropriate presentation of the natural and cultural values of Kakadu National Park in accordance with IUCN Protected Area Category ‘national park’ is paramount, and that all commercial activities would be considered within this context.

Under s.354(1) of the EPBC Act commercial taking or harvesting of wildlife may only be carried on in accordance with this Plan. The taking of wildlife protected by Part 13 of the Act must also be in accordance with applicable provisions of Part 13. Activities that are “access to biological resources” are subject to Part 8A of the EPBC Regulations, unless this Plan provides otherwise.

### **Issues**

- Being involved in businesses based on commercial use of wildlife may help Bininj to protect and maintain culture by being out on country and maintaining cultural knowledge about the types, ecology and customary use of native plants and animals.
- To ensure that Bininj gain social and economic benefits from current and proposed commercial use, it is important that Bininj carry out these activities independently or through business arrangements from which they are the primary beneficiaries.
- In addition to meeting strict requirements for sustainability and compatibility with the natural values for which the Park was declared, commercial use of any plant or animal must not impact on local customary or subsistence wildlife use.

## **What we are going to do**

### ***Policies***

- 5.10.1 Proposals to take or harvest native wildlife that involve access to biological resources within the meaning of Part 8A of the EPBC Regulations will be managed in accordance with Section 5.9 of this Plan. All other proposals for the commercial take or harvest native wildlife will be managed in accordance with the following Policies and Actions.
- 5.10.2 Proposals for commercial take or harvest of native wildlife will only be considered if they satisfy the following criteria:
- (a) The proposal will not adversely affect the conservation status of the species or wildlife or a population of that species.

- (b) The proposal must be consistent with Bininj cultural practices, including:
  - rules for looking after country properly, making sure the harvest is sustainable, and making sure that people are safe
  - avoiding adverse impacts on use of wildlife by Bininj for food, ceremonial and religious purposes.
- (c) The proposal must be agreed to by senior traditional owners. In accordance with Aboriginal cultural practices, senior traditional owners may specify that agreement is also required from other Bininj with specific responsibilities for the animals, plants or sites that would be affected.
- (d) The proposed activities must be carried out by Bininj or Bininj organisations:
  - acting alone
  - or
  - in partnership with other people under a contract that includes provisions setting the respective roles and responsibilities of the partners and provides for reasonable benefit sharing.
- (e) The proposed activities must be approved by the Board, or be in a class of activities approved by the Board (see Policy 5.10.2).

5.10.3 Proposals for commercial use of native wildlife will be considered under one of two categories.

- (a) Category A: Small-scale activities or classes of activities. At the commencement of this plan, these activities are:
  - small amounts of pandanus for e.g. basket making
  - small amounts of wood and plant materials for artefacts; and
  - bush tucker collection for interpretation activities.
  - Other similar activities or classes of similar activities determined by the Board.

The Board may amend the list of Category A activities from time to time by amending or deleting activities or classes of activities. Category A activities may be carried on in accordance with harvest levels and conditions determined by the Board and will not require a permit from the Director.

- (b) Category B: Any other activities or classes of activities which may only be carried on in accordance with a permit issued by the Director, subject to Board approval.

5.10.4 In addition to requirements set out in Policies 5.10.1 and 5.10.2 in considering harvest levels and conditions for Category A activities, and proposals for Category B activities, the Board will consider:

- consistency of the activity with World Heritage values and management principles (Appendix B and Appendix G)
- consistency of the activity with IUCN Management principles for a national park (Section 3)
- consistency of the activity with principles of ecologically sustainable use (Appendix G)
- likely impacts on species protected under the EPBC Act or Northern Territory laws
- harvest methods, location, extent, timing and frequency of the activity

- end use of the resource and consistency of presentation of Kakadu National Park as aboriginal land and a national park of World Heritage status
- visitor and other safety issues
- the extent to which the activity will provide benefits to Bininj; and
- the costs to the Director of managing and monitoring the activity.

5.10.5 In addition to Policy 5.10.3, before making a decision in relation to Category B proposals, the Board will require:

- the preparation of an Environmental Impact Assessment and
- the proposal to be made available for public comment.

The Board may also require:

- the preparation of a wildlife management plan by the proponent; and
- the proponent to seek approval from an independent Animal Ethics Committee.

### **Action**

5.10.4 The Board will determine harvest levels and conditions for Category A activities, and may review these from time to time.

## **5.11 Weeds and introduced plants**

### **Our aim**

Through working with Bininj, Park values are protected by strategic management of weeds, prevention of invasion of new species, and increased understanding of weed management issues among Park residents, neighbours and visitors.

### **Measuring how well we are meeting our aim**

- Coverage and spread of weeds of significance that threaten Park values
- Level of Bininj satisfaction with how well country is being looked after through management of weeds and how much involvement Bininj have in weed programs
- The number, identity and coverage of any new weed species, particularly species likely to impact significantly on Park ecosystems

### **Background**

Weeds are one of the most significant threats to all habitats within the Park. Seventy-eight weed species were known to occur in the Park in 2005. Many of these were introduced during the pastoral era while, more recently, others were introduced both intentionally and accidentally into lease areas within the Park. Some species, such as olive hymenachne, mimosa and salvinia, are listed on the Australian Government list of Weeds of National Significance.

Weeds compete with native plants and may change the structure of the different vegetation communities and decrease the amount of food resources and habitat availability for animals. Some highly invasive weed species, such as mission grass and gamba grass, cause dramatic increases in the intensity of fires. Mission grass has emerged as a major weed management issue within the north-east and central parts of the Park. Weeds also directly affect how Bininj are able to access and collect various food resources, as some food resources are displaced or a physical barrier is created making it hard for Bininj to hunt and gather. Access to some

visitor areas may also be restricted due to the presence of highly invasive weeds such as salvinia.

Significant resources have been committed to priority weed management programs. District staff undertake weed control programs each wet season in accordance with district weed management strategies, and provide support to outstation residents and neighbours in weed control activities. During the life of the previous Plan, a team of staff was employed to control grassy weeds such as mission grass, gamba grass and olive hymenachne. Biological control techniques have been used to help control weeds such as salvinia and sida species. All known infestations of mimosa are being managed through regular monitoring and control activities and are considered to be under control. Research undertaken into ecology and management of several important weed species has improved methods of control.

Park staff have good relations with neighbours and work together on weed management issues. For example, ERA commits significant resources to the management of weeds on its leases and ERA and Park staff exchange information about weed issues. In addition, the Northern Territory Government has indicated that it would like to continue to enhance existing liaison in regards to management of weeds on the road network it manages in the Park.

The EPBC Regulations prohibit bringing plants into the Park, or cultivating plants, except in accordance with this Plan, or a permit from the Director. Jabiru residents may bring in and cultivate plants if they are on a list provided by the Director.

The *Weeds Management Act 2001* (NT) applies to the Park in so far as it is not inconsistent with the EPBC Act, this Plan or the EPBC Regulations.

### **Issues**

- Bininj would like to be actively involved in planning, undertaking and reviewing the outcomes of weed management programs to enable them to fulfil customary obligations of caring for country. As they visit some areas of the Park more frequently than Balanda, some Bininj are also able to assist with the early detection of new infestations.
- Priorities for control need to be established and the effectiveness of weed management programs should be reviewed regularly. Comprehensive weed surveys and data recording activities are required to assist with the identification and prioritisation of weed control efforts.
- 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, olive hymenachne, and knobweed 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.
- Regional weed management strategies that consider the location and potential transport of weeds within catchments are required. The risks associated with the spread of weeds from Kakadu to other areas also need to be carefully managed. Plants brought into leasehold areas also have the potential to impact on the Park.
- Use of chemical herbicides may have an impact on plants that Bininj collect for food (such as yams and waterlilies) and there may be potential impacts associated with the use of residual chemicals.
- Proposals for developments both within the Park, such as new infrastructure, and outside the Park, such as pastoral developments, may pose significant risks for introduction of weeds (see Section 8.3, Assessment of proposals).

- Park staff and community members involved in weed management programs should be trained appropriately to enable them to safely and effectively manage and undertake weed management programs.
- Research into the ecology and methods of dispersal of individual species will help improve the efficiency of weed control programs. To date the impacts of feral animals on weed distribution and abundance are largely unquantified (see Section 8.6, Research and monitoring).
- Levels of awareness within the general community regarding the importance of weed management issues need to be improved to minimise the risk of accidental spread of weeds.

## **What we are going to do**

### ***Policies***

- 5.11.1 Weed management programs will be developed, prioritised, reviewed and implemented jointly with Bininj using best weed management practices.
- 5.11.2 The Director will observe the *Weeds Management Act 2001* (NT) where appropriate and where it is not inconsistent with this Plan.
- 5.11.3 Cooperative research programs with relevant research institutions will be supported to undertake research into weed ecology, dispersal, and control options (see Section 8.6, Research and monitoring).
- 5.11.4 Weed management within catchments will be a key consideration during the development of weed management programs. Close liaison will be maintained with neighbours and other government agencies, and assistance with training, cooperative surveys, and control programs will be provided when possible.
- 5.11.5 Biological and manual weed control methods will be preferred. Chemical control will only be used when the ecological and economic benefits outweigh any potential negative ecological impacts.
- 5.11.6 Development and implementation of weed prevention and management measures will be required for development proposals within the Park. Requirements will be specified in contracts and their implementation will be monitored (see also Section 8.3, Assessment of proposals).
- 5.11.7 The Director will encourage the development of a nursery in Jabiru; if a nursery is established the Director will consider whether other plants should be allowed to be introduced into the Park, and may vary or revoke the Approved Plants List see also Section 5.6, Landscapes, soils and water and Section 7.1, Jabiru).
- 5.11.8 Park staff will maintain awareness of and consistency with national and regional weed management plans. This will include seeking representation on any groups involved with regional weed management issues where possible.
- 5.11.9 Access to areas in the Park may be subject to review to help ensure values of an area are protected, or if the threat from weeds is reduced.
- 5.11.10 Plants may be brought into the Park in accordance with a permit issued by the Director. Plants may be brought into leasehold areas and other occupancies in the Park with the approval of the Director.

### ***Actions***

- 5.11.11 Develop and implement weed management programs and strategies for high priority and sleeper weed species. These include those listed on the Australian Government list of Weeds of National Significance (such as mimosa, salvinia, and olive

hymenachne), highly invasive grassy weeds, and others listed in district weed control plans.

5.11.12 Review and update as required district weed control plans in conjunction with Bininj.

5.11.13 Continue to map the distribution of weeds in the Park and prepare weed risk assessments using GIS. As a priority, monitor weed distribution at visitor areas and downstream of river and creek crossings.

5.11.14 Provide support to local organisations during the preparation of weed management programs for mining leases, Park leases and outstation areas.

5.11.15 Develop and implement an integrated identification, control and monitoring training programs for Park staff and Bininj community members involved in weed management.

5.11.16 Develop and implement education programs for Park residents, contractors, businesses, neighbours and schools on weed identification, impacts, management and spread pathways.

## **5.12 Feral and domestic animals**

### **Our aim**

Through control programs developed and implemented in consultation with Bininj, the adverse effects of domestic and feral animals on the natural and cultural values of the Park, and on human safety, are minimised.

### **Measuring how well we are meeting our aim**

- Extent to which values within identified management areas have recovered from feral animal impacts
- Bininj satisfaction with level of involvement in the planning and management of feral animal programs

### **Background**

Feral animals can damage the cultural and natural values of country. They may impact on access, aesthetics and available food resources, and cause erosion, salt water intrusion, and the spread of weeds. Asian water buffalo, cattle, pigs, horses, donkeys, dogs, cats, European bees, cane toads and introduced ants are present in Kakadu. There are also risks that new species, such as crazy ants, will invade.

The Asian water buffalo caused considerable impacts on freshwater/floodplain, woodland, tidal flat, monsoon forest and escarpment ecosystems as well as rock art sites. Freshwater springs were particularly impacted and many changed from clear running systems to turbid sediment carrying systems. Buffalo are also one of the major feral animal threats to the effective management of Mimosa and other weeds. The Brucellosis and Tuberculosis Eradication Campaign (BTEC), completed in 1997, removed most buffalo from the Park and enabled disturbed areas to recover. Since then, the numbers of buffalo in the Park have increased gradually. Most feral animal control programs in recent years have focused on temporary reductions of pig and horse numbers. More recently, isolated populations of big-headed ants were controlled in the Park, Jabiru and lease areas.

Control of cane toads has not been attempted in the Park as at the time of preparing this Plan there is no known method to manage populations of cane toads over large areas. However, monitoring programs related to cane toad distribution and impacts on native wildlife are in

place within the different habitats in the Park. The Australian Government is currently undertaking research into potential biological control options for cane toads.

Bininj place a range of values on some introduced animals which are influenced by the history of association between Bininj and each species over time. They value particular species as a source of food, such as buffalo, cattle and pigs, and believe in the idea of rights to exist on country, for example horses were around long before the declaration of the Park and some Bininj feel they have a right to continue to live here. During the life of the previous Plan, a small herd of buffalo was kept in a fenced area in the Park of approximately 12,000 hectares (known as the Buffalo Farm) to provide meat for Bininj. The Board also established a sub committee to review the future of the Buffalo Farm,

In consultation with Bininj, a comprehensive feral animal strategy for the Park has been developed. The strategy emphasises joint decision-making about values requiring protection and joint assessment of effectiveness in reducing damage to important values. It provides decision support tools and processes, and manuals for management of a range of threats and situations. The strategy emphasises prevention of new invasions, in part through participation in relevant national and regional forums assessing proposals for introductions.

Regulation 12.19 of the EPBC Regulations prohibits bringing in or keeping animals in the Park, except in accordance with this Plan or a permit issued by the Director. This prohibition does not apply to guide dogs for the blind, hearing dogs for the deaf, and other assistance animals for people with disabilities.

### **Issues**

- To ensure that effective control programs are in place, there is a need for a strategic integrated regional approach. Control programs need to consider:
  - how the priority of protecting the parks natural and cultural values can be achieved while respecting the range of values that Bininj place on some introduced animals
  - the range of habitats, differing sensitivities to disturbance, susceptibility to weed invasion, and feral animal populations within adjoining country
  - what levels of damage to country caused by feral animals are seen as unacceptable to Bininj and Park staff
  - analysis and implementation of each control operation in close consultation with Bininj from the different clan estates.
- Some Bininj seek active involvement in conducting control programs and pursuing potential commercial and employment opportunities either jointly with the Park or independently through contracts between the Park and local Aboriginal associations.
- Preventing introductions of species that have the potential to establish unmanaged populations is the most important option available for reducing risk of additional damage caused by feral animals. At the time of writing this Plan, species that have the potential to enter the Park include banteng, sambar deer and crazy ants.
- Rules regarding restrictions on what animals may be brought into the Park are not always followed, either intentionally or accidentally through lack of knowledge. Some introduced fish and bird species could become pests or transmit disease to wild populations.
- The risks of some captive animals being released may increase when the population of Jabiru declines.
- Control programs must be conducted safely, effectively and with regard to animal welfare. There is a need to ensure that individuals undertaking control operations are appropriately trained and licensed.
- It is important to provide residents with good information prior to their arrival in the Park about the potential impacts of introduced animals on Park values.



- Programs for individual species need to be well designed to ensure that important values are protected and damage caused by individual species is reduced. Program effectiveness needs to be measured by the protection of values, not numbers of feral animals controlled.
- Pigs, buffalo, horses, cane toads and big-headed ants are regarded as the greatest threats to Park values by both Bininj and Park managers.
- Presently absent from the Park but important potential threats already established or present in the Top End include yellow crazy ants, mosquito fish and other aquarium fish. Invertebrates and smaller vertebrates, including fish, probably present the greatest mid-term threats that the Park needs to be prepared to control.

### Issues for individual species

- **Buffalo and cattle:** Buffalo and cattle are abundant in neighbouring Arnhem Land and pastoral properties, and their numbers are increasing within the Park. Given the costs of culling, the Director may need to investigate cost recovery mechanisms through commercial activities. The future management of the Buffalo Farm needs to be considered. Some Bininj have indicated that they would like to have their own small domestic herds which would require intensive management to ensure they do not compromise control programs.
- **Pigs:** Pigs cause noticeable widespread impacts around springs, floodplains and small rainforest patches. Bininj are concerned about the decline in the numbers of turtles and yams that may be related to the presence of pigs. The spread of weeds such as mimosa and olive hymenachne by pigs through foraging activities is of major concern. Pigs breed rapidly, so populations can quickly re-establish following control.
- **Horses and donkeys:** Horses and donkeys cause erosion around water bodies, carry disease, and aid the spread of weeds such as mission grass, gamba grass and rattlepod. Horses near roads are a public safety issue. Information is required on seasonal distribution and survey techniques to help develop more effective targeted control programs.
- **Cane toads:** Cane toads arrived in the southern regions of Kakadu in 2001 and populations are now well established throughout the Park. Cane toads have serious impacts on some wildlife populations. Toads eat a variety of invertebrate and vertebrate native animals (which not only impact on prey species but also reduces food resources for other native animals), and they have toxic defences that can result in the deaths of animals that eat toads. These impacts also affect the availability of some bush foods for Bininj. Following the arrival of toads in the Park, there has been a notable decline in the numbers of quolls and goannas. Large dragons, elapid snakes and other species are also likely to be affected.
- **Introduced ants:** Introduced ants are capable of displacing other invertebrates such as green ants, therefore altering food availability for native animals. Introduced ants currently found in the Park include the ginger ant, pharaohs ant, Singapore ant, ghost ant and big-headed ant. Major costs have been associated with the control of big-headed ants in Kakadu since 2001. The possible introduction of the crazy ant is of major concern. Staff and residents need to be well equipped to quickly and reliably recognise introduced ant species.
- **Cats and dogs:** There is a lack of information about the impacts and population of cats. However, cats are believed to prey on animals within all habitat types. Cats are also vectors of human and animal disease. To date, no effective cat control program has been developed. Feral dogs interbreed with dingoes, and in some locations hybrid dingoes may come to dominate dingo populations and place increased pressure on native wildlife within the Park. Dogs that are not looked after may pose health risks in Jabiru and in Aboriginal living areas.
- **Exotic aquatic animals:** The introduction of exotic aquatic animals and aquarium plants into waterways within the Park would pose significant ecological risks. In addition exotic

marine animals, such as the Black Stripped Mussel could pose significant threats to the coastal and estuary areas of the Park.

- **Exotic birds:** Residents and visitors are not allowed to bring in pet birds, as they may introduce diseases and some species may become pests. Eradication of exotic birds is difficult if large populations become established over significant areas. Species accidentally introduced into Darwin, such as tree sparrows and spice finches, could become a problem in Kakadu if they become established on the Territory mainland.
- **European bees:** European bees may adversely affect native insects and compete with native animals for nectar, pollen and tree hollows. Research is required to determine the abundance and level of impacts of European bees on wildlife within the Park. Control by Park staff does not presently extend beyond Park infrastructure and tourist areas.
- **Biological control agents:** The *Cyrtobagous* weevil was introduced into the Park in 1983 to aid with salvinia control. The side leaf-feeding beetle (*Calligrapha pantherina*) is also present in the Park. No adverse ecological impacts of these agents have been reported. Research is currently under way into the development of a biological control agent for cane toads. Some mimosa control agents have been developed but not introduced to Kakadu as they are only viable where there are extensive stands of mimosa.

## What we are going to do

### *Policies*

- 5.12.1 Recommendations from the Feral Animal Management Strategy for the Park will be implemented after public comments have been sought and following Board approval. Decision support tools will be used to help Park staff and Bininj to make joint decisions using current information about costs, reducing damage, generating income, monitoring populations over time and acknowledging the interest of some individuals in small populations being maintained.
- 5.12.2 Protocols for ensuring that animal welfare standards are met will be rigorously observed.
- 5.12.3 The Director will implement controls for the entry and movement within the Park of soils, pot plants, logs and other materials with a high potential for spreading feral animals and diseases.
- 5.12.4 The entry of dogs to the Park with visitors will be restricted to guide dogs for the vision and hearing impaired, or an assistance animal used by a person with a disability. Permits to bring dogs in for other purposes will only be considered in exceptional circumstances.
- 5.12.5 Park staff, and residents within lease areas may keep no more than two dogs per household without a permit issued by the Director. Cats or pet birds are not permitted to be kept, but exceptions may be made with the Director's approval for local, native birds that cannot be rehabilitated to the wild.
- 5.12.6 Park staff, Jabiru residents and residents within lease areas will only be permitted to keep fish native to the Magela Creek system in aquariums and permits may be issued to collect specimens for this purpose.
- 5.12.7 The Director may provide training in control techniques to enable Bininj not employed by the Park to obtain required licences.
- 5.12.8 Park staff will work with neighbours and cooperate with relevant Northern Territory authorities to develop regional approaches for feral animal management.
- 5.12.9 Opportunistic control will be undertaken for cats and dogs. Feral dogs and European bees will be actively controlled where they present particular health and safety risks to people or otherwise cause a significant nuisance.

- 5.12.10 Future proposals regarding the introduction of biological control agents will only be approved subject to rigorous research. This will help to ensure that the chance of any potential negative impacts on Park values caused by their introduction is minimised.
- 5.12.11 Non-native animals may be brought into or taken through the Park in accordance with a permit issued by the Director and where it is consistent with policies and actions in this Plan.
- 5.12.12 Managed herds may only be kept at the existing Buffalo Farm.

### **Actions**

- 5.12.13 Develop and implement feral animal plans for districts which include identification by Park staff and Bininj of:
- the values to be protected
  - sites suffering damage and hence requiring control programs
  - methods to be adopted
  - processes to measure and report on effectiveness of actions.
- 5.12.14 Develop decision support tools to assist in implementation of feral animal plans.
- 5.12.15 Develop contingency plans for managing introductions of particularly high risk feral animal species.
- 5.12.16 Cooperate with relevant agencies in pursuing a collaborative approach to the management and control of cane toads.
- 5.12.17 Provide regular reports to the Board that include information on Bininj participation, assessment of outcomes achieved and lessons learnt.
- 5.12.18 Park staff will work with Bininj to investigate the ecological, operational and safety issues associated with business and tourism proposals that involve the harvest of feral animals.
- 5.12.19 Review the future of the Buffalo Farm and prepare a rehabilitation strategy.
- 5.12.20 Work with landowners in Arnhem Land and on the western boundary and cooperate with relevant Northern Territory authorities to develop regional approaches for feral animal management and to help minimise cross border movement.
- 5.12.21 Liaise with the Jabiru Health Clinic to develop appropriate management programs for dogs kept in Jabiru and Aboriginal living areas.
- 5.12.22 Maintain awareness about national research into the development of biological and other control methods, and seek involvement with relevant decision-making committees regarding the introduction and keeping of exotic species in the Top End. Develop contingency plans as needed for particularly high-risk species.
- 5.12.23 Continue to monitor populations of *Cyrtobagous* weevil within *Salvinia* infested localities.
- 5.12.24 Work with relevant regional authorities to prepare public education programs. Prepare and distribute information about the recognition of feral animals, their known impacts and preferred management actions. Review the information annually.
- 5.12.25 Prepare and distribute an information kit to all Park residents, businesses, relevant tourism associations, freight companies and contractors to inform them of relevant EPBC Regulations and Management Plan requirements regarding the entry of plant, animal and soil material into the Park.