

Alligator Rivers coastal floodplains

Location and Description

The Alligator Rivers coastal floodplains include four large adjacent floodplains that form the southern coastline of Van Diemen Gulf, about 190 km east of Darwin. These are the iconic wetlands of Kakadu National Park. The floodplains extend along the major rivers (Wildman, and West, South and East Alligator) and seasonal creeks (notably Magela, Nourlangie and Murgarella) in the region. The floodplains form a continuous wetland system with the Mary River and Adelaide River floodplains. This mosaic of diverse wetland habitats includes seasonally flooded freshwater floodplains and swamps, and tidally influenced mud flats and mangroves in the lower river reaches.

Tenure and Land Use

The Alligator Rivers floodplains site is predominantly Aboriginal freehold land and is held by a number of Aboriginal land trusts (mostly the Arnhem Land and Kakadu Aboriginal Land Trusts). A small portion of the site west of the Wildman River is Crown leasehold land and includes one pastoral property (Carmor Plains). Almost 65% of the Site is leased to Parks Australia and managed as part of Kakadu National Park for conservation, tourism and recreation. Other uses within the site include Indigenous, pastoral operations, and uranium mining in the Magela Creek area.

Significance Rating

International Significance

Ecological Values

The floodplains of the Alligator Rivers are unique in Australia in the diversity of wetland habitats and abundance of wildlife they support. More than two million waterbirds, notably Magpie Geese and ducks have been recorded, including internationally significant counts of more than 20 species. Large aggregations of shorebirds also occur seasonally in parts of the floodplain. The Site is also very important for threatened species; 32 threatened species have been recorded from the Site.

Management Issues

Introduced animals and plants, especially *Mimosa pigra* and *Salvinia molesta*, are affecting the conservation values of the floodplains and require ongoing management.

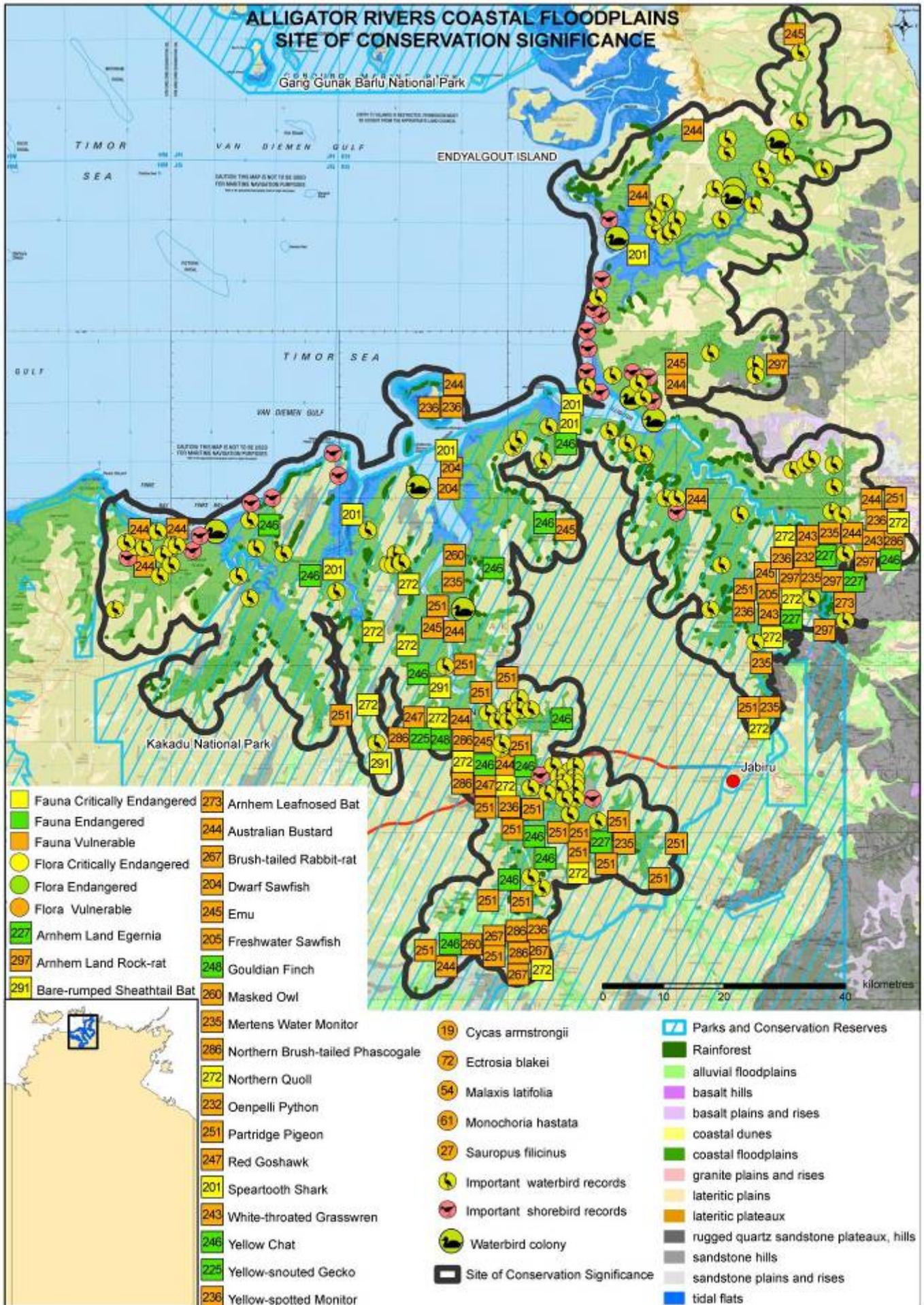


Condition

Condition varies across the Site, with areas heavily impacted by weeds or feral animals or recreational activities, and other areas in a more natural state.

Current Conservation Initiatives

The large portion of the floodplains within Kakadu National Park is managed through the recently revised plan of management for the park. Significant resources are invested in weed management programs, and fire management in the park is designed to replicate traditional Aboriginal burning practices. The Indigenous ranger group based in Gunbalanya manages *Mimosa pigra* on the East Alligator floodplain, as well as fire and some other weeds in the broader area. Long term ecological research and monitoring of uranium mine activities in the Kakadu region has been conducted by the Environmental Research Institute of the Supervising Scientist (ERISS).



LOCATION	SOCS Number	15 (NT Parks and Conservation Masterplan Map Number 6)
	Latitude/Longitude	12° 18' South, 132° 33' East (at centre)
	Bioregion	Darwin Coastal (85%), Pine Creek (10%), Arnhem Coast (4%), Arnhem Plateau (1%)
	Description	<p>This site encompasses the five large and adjacent floodplains associated with the West, South, and East Alligator rivers, the Wildman River, and Murgendela Creek, and encompasses an area of almost 7130 km². It extends from Point Stuart on the western end of Finke Bay to the mouth of the Minimini Creek in the north, and is dominated by seasonally inundated freshwater floodplains (2978 km²), with smaller areas of alluvial floodplains (210 km²). The rivers are tidal in their lower reaches and associated with them are large areas of tidal flats (443 km²). This site includes Field and Barron islands which lie near the mouth of the South Alligator River.</p> <p>The site abuts the Mary River coastal floodplain, to the west, the Cobourg Peninsula, to the north, and the West Arnhem Plateau to the south-east. These are also recognised as sites of high conservation significance in the NT.</p>
THREATENED SPECIES	Significance Rating	International Significance
	Threatened plants and animals (Listings at National/NT level CR - Critically Endangered, EN - Endangered, VU - Vulnerable, NT - Near Threatened, LC - Least Concern, DD - Data Deficient)	32 threatened species are reported from this site. Plants <ul style="list-style-type: none"> ▪ <i>Cycas armstrongii</i> (-/VU) ▪ <i>Ectrosia blakei</i> (VU/DD) ▪ <i>Malaxis latifolia</i> (-/VU) ▪ <i>Monochoria hastate</i> (-/VU) ▪ <i>Sauropus filicinus</i> (VU/DD) Vertebrates <ul style="list-style-type: none"> ▪ Australian Bustard <i>Ardeotis australis</i> (-/VU) ▪ Emu <i>Dromaius novaehollandiae</i> (-/VU) ▪ Gouldian Finch <i>Erythrura gouldiae</i> (EN/EN) ▪ Masked Owl (north Australian mainland subspecies) <i>Tyto novaehollandiae kimberli</i> (VU/VU) ▪ Partridge Pigeon <i>Geophaps smithii</i> (VU/VU) ▪ Red Goshawk <i>Erythrotriorchis radiatus</i> (VU/VU) ▪ White-throated Grasswren <i>Amytornis woodwardi</i> (-/VU) ▪ Yellow Chat (Alligator River subspecies) <i>Epthianura crocea tunneyi</i> (VU/EN) ▪ Arnhem Leaf-nosed Bat <i>Hipposideros inornata</i> (-/VU) ▪ Arnhem Rock-rat <i>Zyomys maini</i> (VU/VU) ▪ Bare-rumped Sheath-tail Bat <i>Saccolaimus saccolaimus</i> (CR/-) ▪ Brush-tailed Rabbit-rat <i>Conilurus penicillatus</i> (-/VU) ▪ Northern Brush-tailed Phascogale <i>Phascogale pirata</i> (-/VU) ▪ Northern Quoll <i>Dasyurus hallucatus</i> (EN/CR) ▪ Arnhem Land Egernia <i>Egernia obiri</i> (EN/EN) ▪ Merten's Water Monitor <i>Varanus mertensi</i> (-/VU) ▪ Oenpelli Python <i>Morelia oenpelliensis</i> (-/VU) ▪ Yellow-snouted Gecko <i>Diplodactylus occultus</i> (EN/VU) ▪ Yellow-spotted Monitor <i>Varanus panoptes</i> (-/VU) ▪ Flatback Turtle <i>Natator depressus</i> (VU/DD) ▪ Green Turtle <i>Chelonia mydas</i> (VU/LC) (Miles 1998 in Finlayson 2006) ▪ Loggerhead Turtle <i>Caretta caretta</i> (EN/EN) (Miles 1998 in Finlayson 2006) ▪ Olive Ridley <i>Lepidochelys olivacea</i> (EN/DD) (Vanderlely 1995 in Finlayson 2006) ▪ Dwarf Sawfish <i>Pristis clavata</i> (-/VU) ▪ Freshwater Sawfish <i>Pristis microdon</i> (VU/VU) ▪ Northern River Shark <i>Glyphis</i> sp. C (EN/EN) ▪ Speartooth Shark <i>Glyphis</i> sp. A (CR/VU)
ENDEMIC SPECIES	Significance Rating	Not Significant
	Notes	<p>Endemic to the bioregion: The Alligator Rivers Ctenotus (<i>Ctenotus kurnbudj</i>) is endemic to the NT and is only known from the Darwin Coastal bioregion.</p> <p>Endemic to the NT: 184 plant and 32 vertebrate species recorded from this site are endemic to the NT.</p> <p>Other: Six plant and two vertebrate species (<i>Cryptoblepharus</i> sp. "Mt Borradaile" and Bare-rumped Sheath-tail Bat <i>Saccolaimus saccolaimus</i>) are only known from the site or the Darwin Coastal bioregion within the NT, but are also found in other states.</p>
WILDLIFE AGGREGATIONS	Significance Rating	International Significance
	Marine turtles	This site comprises little suitable nesting habitat for marine turtles although Field Island at the mouth of the South Alligator River has a small beach which regularly supports small numbers of nesting Flatback Turtles (Chatto and Baker 2008). Other authors have also reported Olive Ridley (Vanderlely 1995 in Finlayson 2006), Loggerhead and Green Turtles nesting on Field Island and in the West Alligator Head area (Miles 1998).
	Seabirds	No seabird breeding colonies are known from coastal areas in the Alligator Rivers region (Chatto 2001). Whiskered Terns do breed in the site and maximum counts of about 45 000 individuals (Morton <i>et al.</i> 1989) are internationally significant (>1% global population; G. Dutson in prep.).

	Waterbirds	<p>Total numbers of waterbirds: Results of surveys between 1981 and 1984 show that the major floodplains in this site are likely to support a population of >2.5 million individuals, dominated by Magpie Geese and Wandering Whistling-ducks (Morton <i>et al.</i> 1989). Extrapolating these maximum estimates to the whole of this site suggests that it may support five million waterbirds (Dutson in prep.). Large numbers of waterbirds are also reported on the individual floodplains during surveys by Chatto (2006). Waterbird usage of the floodplains varies seasonally, but the maximum numbers of most species occur during the Dry season (Morton <i>et al.</i> 1989), and the South Alligator River floodplains are the major dry season refuge in the NT for Magpie Geese (Bayliss and Yeomans 1990).</p> <p>Counts of individual species: Maximum counts of at least 20 species are internationally significant (> 1% global population; G. Dutson in prep.) including: 1.6 million Magpie Goose; 400 000 Wandering Whistling-Duck; 50 000 Plumed Whistling-Duck; 20 000 Radjah Shelduck; 50 000 Green Pygmy-Goose; 60 000 Pacific Black Duck; 50 000 Grey Teal; 50 000 Australian Pelican; 50 000 Pied Heron; 200 000 Intermediate Egret; 60 000 Glossy Ibis; 15 000 Australian White Ibis; 80 000 Straw-necked Ibis; 35 000 Royal Spoonbill; 24 000 Brolga; 25 000 Comb-crested Jacana; 100 000 Black-winged Stilt; 80 000 Masked Lapwing; and 30 000 Australian Pratincole (Morton <i>et al.</i> 1989).</p> <p>High counts of other species include: 3000 White-necked Heron; 15 000 Australian White Ibis; and 2000 Australasian Darter (Morton <i>et al.</i> 1989) and some of these counts are likely to be nationally significant (>1% Oceania populations; Wetlands International 2006).</p> <p>Chatto (2006; R. Chatto, NRETAS unpubl.) notes 214 important waterbird records for this site, including the significant counts of species identified above and others that are regionally important.</p> <p>Breeding records: Morton <i>et al.</i> (1989) notes that few waterbird species breed in large numbers in the Alligator Rivers region but Chatto (2000a) reported nine breeding colonies, mostly located in mangroves fringing the major rivers. Four colonies supported 10 000 or more waterbirds and were dominated by egrets, herons and cormorants. The floodplains are also important for nesting Magpie Geese, after the Mary-Adelaide and Daly River floodplains (Bayliss and Yeomans 1990).</p> <p>Dry season refuge: Morton <i>et al.</i> (1990b) notes that the Alligator Rivers region is an important dry season refuge for waterbirds because of the atypical persistence of freshwaters on floodplains such as the Magela and Nourlangie.</p>
	Shorebirds	<p>Total numbers of shorebirds: This site comprises extensive tidal flats and large aggregations of shorebirds are reported from Finke Bay (9000 in 1993) and in coastal areas between the South Alligator River and Minimini Creek (12 500 in 1992) (Chatto 2003). Commonly reported species include Whimbrel, Eastern Curlew and Black-tailed Godwit. The inland wetlands and dry season grasslands in the site are also important for shorebirds, especially temporary influxes of large numbers of Little Curlews (Chatto 2003).</p> <p>Counts of individual species: Maximum counts of species that are internationally significant (> 1% East Asian-Australasian Flyway population; Bamford <i>et al.</i> 2008) include: 1600 Marsh Sandpiper; 4900 Sharp-tailed Sandpiper (Chatto 2003); 180 000 Little Curlew; 30 000 Australian Pratincole (Morton <i>et al.</i> 1989); 300 Common Sandpiper (Bamford 1988).</p> <p>Chatto (2003; R. Chatto NRETAS unpubl.) notes 29 important shorebird records for this site including the significant counts identified above and others that are regionally important.</p>
	Other aggregations	None known
WETLANDS	Significance Rating	International Significance
	Ramsar criteria met	Wetland components of Kakadu Stage I, II and III are listed as wetlands of international importance under the Ramsar Convention on Wetlands. ID 5AU002: Kakadu (Stage I and components of Stage III). Criteria met: 1a, 1b, 1c, 2a, 2b, 3a, 3b, 3c. ID 5AU030: Kakadu National Park (Stage II). Criteria met: 1a, 1c, 2b, 2c, 3a, 3b, 3c.
	DIWA criteria met	Wetlands within this site are listed as wetlands of national significance in the Directory of Important Wetlands in Australia (DIWA). ID: NT017 Kakadu National Park. Criteria met: 1, 2, 3, 4, 5, 6 Wetland types: A1, A2, A5, A6, A7, A8, A9, B1, B2, B3, B9, B10, B14, B17, C1. ID: NT028 Murgengella-Cooper Floodplain System. Criteria met: 1, 2, 3, 4, 6. Wetland types: B4, A8, A6, A9, A7, B1, B2, B10.
	Notes	The wetlands of Kakadu National Park are designated as internationally important due, in part, to their importance in a biogeographical context, the outstanding diversity of their plant communities, and their role in conserving the large numbers of waterfowl that congregate on the flood plains during the Dry season (Finlayson <i>et al.</i> 1990, 2006). Kakadu National Park (Stage I and II) have been identified as priority High Conservation Value Aquatic Ecosystems (Commonwealth of Australia 2008) and as targets for investment in the Caring for our Country Business Plan 2009-2010.
	Rivers	Entire or near-entire catchments of the major and smaller rivers in this site are protected within Kakadu National Park: almost the entire catchments of the South Alligator and West Alligator Rivers, and part of the catchments of the East Alligator and Wildman Rivers, including extensive areas of wetlands associated with all of them, are protected within Kakadu National Park (Finlayson <i>et al.</i> 2006; DIWA).
FLORA	Significance Rating	National Significance
	Notes	Rainforest: Almost 11 000 ha of monsoon forest (~4% of the NT rainforest estate) occurs as scattered patches around the margins of the individual floodplains in this site, and there are at least 20 patches >100 ha (Russell-Smith 1991).

OTHER ENVIRONMENTAL VALUES		<p>The Alligator Rivers floodplains are included within Kakadu National Park which has UNESCO World Heritage listing for outstanding cultural and natural universal values (UNESCO).</p> <p>The Alligator Rivers floodplains are proposed to be nominated by Birds Australia as an internationally-recognised <i>Important Bird Area</i> (G. Dutson in prep.).</p> <p>Kakadu National Park is identified as an internationally important site for migratory shorebirds in the East Asian-Australasian Flyway (Bamford <i>et al.</i> 2008).</p> <p>The reptile fauna of the Kakadu region (as defined by Finlayson <i>et al.</i> 2006 and includes part of the Arnhem Land plateau) is one of the most diverse in Australia, with 127 species recorded (Press <i>et al.</i> 1995 in Finlayson <i>et al.</i> 2006).</p> <p>Saltwater and Freshwater Crocodiles are considered to be abundant in the rivers and lagoons in the Alligator Rivers region (Finlayson <i>et al.</i> 2006) and especially abundant in the Wildman River (Fukuda <i>et al.</i> 2007).</p> <p>Unlike many other major rivers in the Top End, the South Alligator River is not subject to crocodile egg or adult harvesting (PWSNT 2005).</p> <p>The South Alligator River represents a significant refuge for the Pig-nosed Turtle which has a fairly limited distribution in the Kakadu region (Press <i>et al.</i> 1995 in Finlayson <i>et al.</i> 2006).</p> <p>Much of the eastern portion of this site will be incorporated into the proposed Wardekken Indigenous Protected Area (Wardekken Land Management Limited in prep.)</p> <p>59 species recorded in this site are listed under international conventions or bilateral agreements protecting migratory species.</p> <p>The marine areas within this site are likely to encompass significant biodiversity values and these are currently being explored and collated in a project by the Marine Biodiversity Group of NRETAS (K. Edyvane, NRETAS, pers. comm.).</p> <p>A number of places in this site are listed on the Register of the National Estate for their natural values including: Acacia Gap, Alligator Rivers Region, Point Stuart Area, Woolwonga Wildlife Sanctuary (former), Wildman River Catchment, Gimbat / Goodparla Pastoral Leases (former), Kakadu National Park and (former) Gimbat / Goodparla Pastoral Leases, and Ballyangardy Spring Jungles (Australian Heritage Council).</p>
MANAGEMENT ISSUES		<p>Fire: In the period 1993-2004, 45% of the site was burnt in fewer than three years, and 8% was burnt in more than six years.</p> <p>Feral animals: Buffalo and cattle are abundant in western Arnhem Land and on neighboring pastoral properties, and their numbers are increasing within the national park. Cane Toads reached the park in 2001 and populations are now well established. Recent feral animal control programs have focused on temporary reduction of pig and horse numbers and control of Big-headed Ants. Feral dog, cat and donkey are also present within the site (Kakadu Board of Management 2007).</p> <p>Weeds: Two Weeds of National Significance (<i>Salvinia molesta</i>, <i>Mimosa pigra</i>), 14 category A and B weeds and five other undeclared but problematic environmental weeds (high priority weeds: Smith 2001) are recorded from this site. Extensive infestations of <i>Mimosa pigra</i> and <i>Salvinia molesta</i> on the Alligator Rivers floodplains have been greatly reduced but not eliminated (Kakadu Board of Management 2007).</p> <p>Other: Climate change and sea-level rise is expected to result in the replacement of many freshwater wetlands with saline wetlands and will potentially have a major affect on the conservation values of the floodplains (Finlayson <i>et al.</i> 2006; Cobb <i>et al.</i> 2007).</p> <p>There is some mining exploration in the periphery of this site with localised impacts. Potential downstream impacts associated with uranium mining at Ranger are monitored by <i>eriss</i>.</p>
MANAGEMENT INFORMATION	<p>NRM groups</p> <p>Protected areas</p> <p>Current management plans</p>	<p>Adjumarllarl Rangers (Gunbulanya) (Northern Land Council 2006).</p> <p>Kakadu National Park (4539 km²/ 64% of site), Mary River National Park (Proposed) (15 km²/ 0.2% of site). An Indigenous Protected Area is proposed for the eastern part of the site.</p> <p>Site-specific plans: Kakadu National Park Management Plan 2007-2014 (Kakadu Board of Management 2007); Wardekken Indigenous Protected Area Management Plan (Wardekken Land Management Limited in prep.).</p> <p>National recovery plans for threatened species: Northern Quoll (Hill and Ward in prep.), Gouldian Finch (O'Malley 2006); Masked Owl and Partridge Pigeon (Woinarski 2004a); marine turtles (Environment Australia 2003).</p> <p>Other management plans: Australian Weeds Strategy (NRMCC 2007); Threat Abatement Plan for Predation by Feral Cats (Environment Australia, 1999); Threat Abatement Plan for Predation, habitat degradation, competition and disease transmission by feral pigs (DEH 2005); Threat Abatement Plan to reduce the impacts of tramp ants on biodiversity in Australia and its territories (DEH 2006); FIREPLAN: Fire management for the savanna community (Russell-Smith <i>et al.</i> in press.).</p>

KEY REFERENCES	Monitoring programs and research projects	<p>Fire in the tropical savannas is mapped continuously under the North Australia Fire Information Project http://www.firenorth.org.au/nafi/app/init.jsp</p> <p>There is detailed fire mapping and on ground monitoring of fuel loads at almost 90 permanent plots by Bushfires NT as part of the West Arnhem Land Fire Abatement Project (Russell-Smith <i>et al.</i> 2007).</p> <p>Regular (5-year interval) monitoring of vegetation and fauna is conducted at permanent fire plots in Kakadu National Park (Edwards <i>et al.</i> 2003), with most recent surveys in 2008.</p> <p>Long term research and monitoring related to impacts of mining operations in the Alligator Rivers region has been conducted by Environmental Research Institute of the Supervising Scientist (ERISS) http://www.environment.gov.au/ssd/</p> <p>Magpie Goose populations and nests are surveyed regularly in core habitat areas in the NT, including the Alligator Rivers floodplains (PWCNT 2003).</p> <p>Nesting marine turtles are surveyed annually on Field Island (Kakadu NP).</p> <p>Dolphins are surveyed monthly along transects around the mouth of the South Alligator River (C. Palmer, NRETAS unpubl.).</p> <p>Surveys of Saltwater Crocodiles are conducted annually in major rivers within Kakadu National Park (Lindner 2004).</p> <p>Permanent plots have been established by the Adjumarllarl rangers on the East Alligator floodplain to monitor the distribution of <i>Mimosa pigra</i>.</p> <p>Further research conducted in Kakadu National Park is summarised in Smyth (1995).</p>
	Management recommendations	<p>Co-ordinate management of areas of significant wetlands occurring outside Kakadu National Park (NRETA 2005).</p> <p>Continue to liaise with Kakadu National Park on management of significant wetlands (NRETA 2005).</p> <p>Continued management under the guidelines of the Kakadu National Park Plan of Management and continued review of management guidelines (NRETA 2005).</p> <p>Continue to provide landholders with financial and technical support with Mimosa control as part of NT Mimosa control strategy (NRETA 2005).</p> <p>In the longer term and by agreement with landholders investigate options for developing a conservation agreement (NRETA 2005).</p>
Papers & reports	<p>Bamford, M.J. (1988). <i>Kakadu National Park: a preliminary survey of migratory waders</i>, October/ November 1987. RAOU Report No. 41.</p> <p>Bayliss, P., and Yeomans, K. M. (1990). Seasonal distribution and abundance of magpie geese, <i>Anseranas semipalmata</i> Latham, in the Northern Territory, and their relationship to habitat, 1983-86. <i>Australian Wildlife Research</i> 17, 15-38.</p> <p>Chatto, R. (2006). <i>The distribution and status of waterbirds around the coast and coastal wetlands of the Northern Territory</i>. Technical Report 76, Parks and Wildlife Commission of the Northern Territory, Palmerston. 254pp.</p> <p>Chatto, R. (2003). <i>The distribution and status of shorebirds around the coast and coastal wetlands of the Northern Territory</i>. Technical Report 73, Parks and Wildlife Commission of the Northern Territory, Palmerston. 257pp.</p> <p>DIWA (A Directory of Important Wetlands in Australia). <i>Australian Wetlands Database</i>. Department of Environment, Water, Heritage & the Arts, Canberra ACT (accessed November 2007).</p> <p>Finlayson, M., Lowry, J., Grazia Bellio, M., Nou, S., Pidgeon, R., Walden, D., Humphrey, C., and Fox, G. (2006). Biodiversity of the wetlands of the Kakadu Region, northern Australia. <i>Aquatic Sciences</i> 68, 374–399.</p> <p>Morton, S.R., Brennan, K.G. and Armstrong, M.D. (1989). <i>Distribution and abundance of waterbirds on the Alligator Rivers Region, Northern Territory: Volume 1</i>. Report to the Australian National Parks and Wildlife Service. Office of supervising scientist for the Alligator region, Jabiru, NT.</p> <p>Russell-Smith, J. (1991). Classification, species richness and environmental relations of monsoon rainforest in northern Australia. <i>Journal of Vegetation Science</i> 2, 259-278.</p>	
Contributors		