

Gove Peninsula and north-east Arnhem coast

Location and Description

The Gove Peninsula and north-east Arnhem Coast is on the western side of the Gulf of Carpentaria, in far north-east Arnhem Land. The site is 150 km from north to south and covers an area of approximately 2280 km². The coastline is very picturesque, with extensive coastal dune systems, rocky headlands and granite outcrops, partially vegetated rock and sand islands bounded by clear seas and mangrove-fringed tidal inlets. Inland, the site includes the edge of an extensive lateritic plateau with limited areas of exposed granite outcrops. The vegetation of the area ranges from sparse grasslands covering the primary sand dunes to relatively tall eucalypt open forest on the sand plains and plateaux further inland. Numerous small patches of monsoon forest occur behind coastal dunes and associated with springs and creeklines.

Tenure and Land Use

The Gove Peninsula and adjoining areas are Aboriginal freehold land and part of Arnhem Land Aboriginal Land Trust lands. The land mainly supports Indigenous use and conservation, but other uses include mining, residential, recreation and tourism. Alcan Gove has a mining lease over 200 km² of the Gove Peninsula, which is used for bauxite mining and an alumina refinery. The northern portion of the site is in the Dhimurru Indigenous Protected Area, which includes the Nanydjaka (Cape Arnhem) Indigenous Protected Area, while the remainder of the site is in the more recently declared Laynhapuy Indigenous Protected Area. The area is sparsely populated except for the townships of Nhulunbuy and Yirrkala, adjacent to the mine, but there are numerous outstations throughout the Site.

Significance Rating

International Significance

Ecological Values

Flatback, Hawksbill and Olive Ridley Turtles have been confirmed nesting on mainland beaches and some islands, but the area is especially significant for high density of nesting of Green Turtles. Islands within the Site support internationally significant breeding populations of Bridled and Roseate Terns, as well as significant numbers of other seabirds. A total of 18 threatened species have been recorded from within the Site, including three plant, 14 vertebrate and one butterfly species (although there are no recent records for five of these species). A number of plant and vertebrate species occurring in the Site are restricted within the Northern Territory to the broader north-east Arnhem region, which has interesting biogeographic affinities with Cape York Peninsula, Queensland.

Management Issues

A range of management issues are affecting this area including increasing visitor pressure on sensitive coastal



environments prone to erosion; degradation from vehicle traffic; localised impacts from bauxite mining; infestation by the exotic Yellow Crazy Ant; increases in Water Buffalo density and gradual spread of weeds from disturbed areas. Changed fire regimes and the impacts of commercial fishing and marine debris on marine turtles are also of concern. Dieback is evident in some vegetation communities, and feral cat, dog, horse, pig, Water Buffalo and cattle occur. There is a lack of comprehensive biodiversity data for much of this site and further systematic monitoring of significant seabird and turtle breeding sites is required.

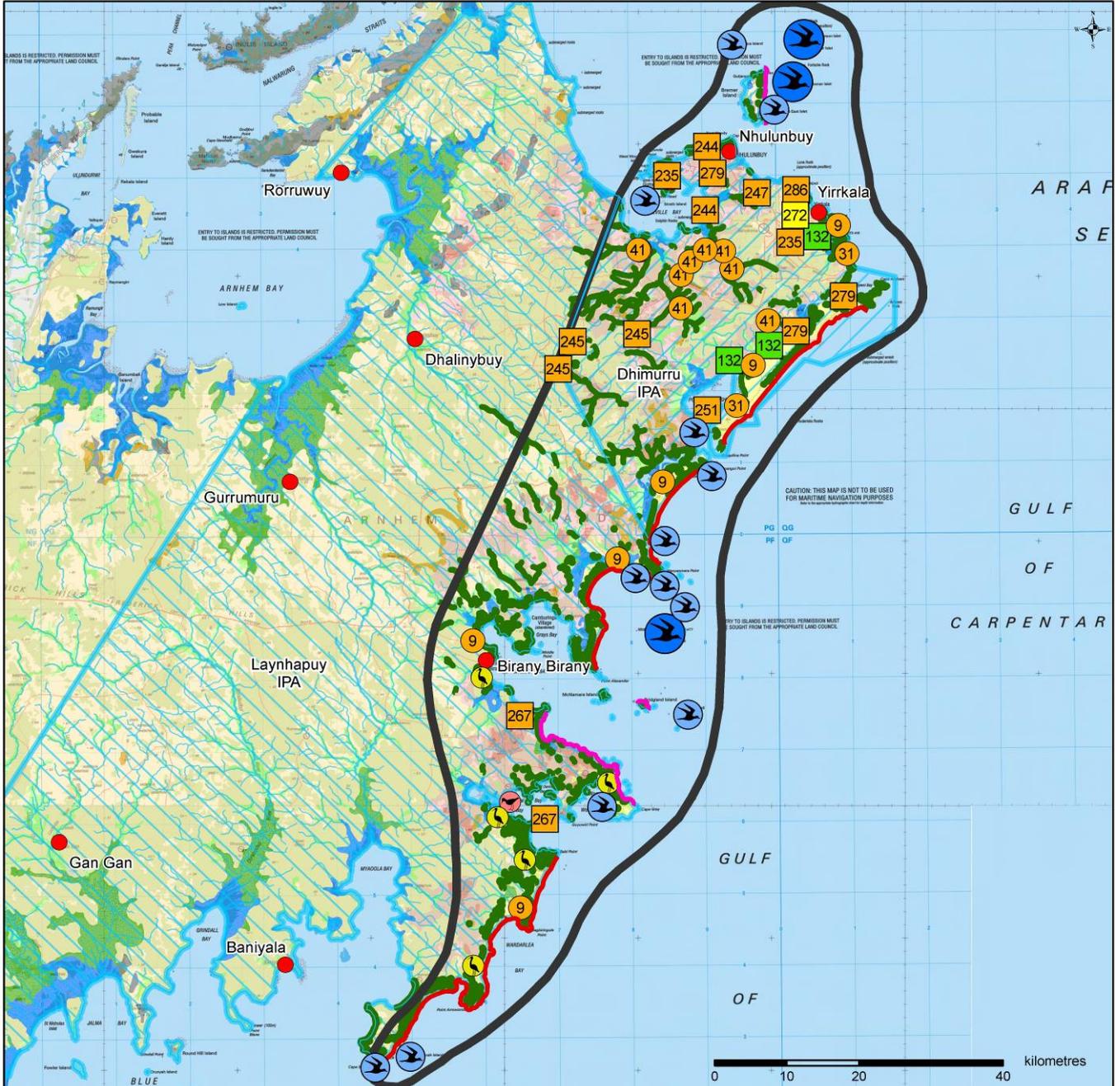
Condition

Outside of the mining lease, this Site comprises a largely intact and weed-free savanna woodland and dune system.

Current Conservation Initiatives

The northern part of this site is in the Dhimurru Indigenous Protected Area and the southern part is in the Laynhapuy Indigenous Protected Area. Indigenous ranger groups based in Nhulunbuy and Yirrkala help to implement management priorities and are currently involved in a range of projects including management of access to recreational areas, weed and feral animal control (including the Yellow Crazy Ant eradication program), threatened species and marine debris surveys, as well as turtle recovery. Alcan Gove is currently undertaking a range of initiatives on or adjacent to the mining lease, and these include surveys and monitoring of rehabilitation areas and other areas affected by mining operations.

GOVE PENINSULA AND NORTH-EAST ARNHEM COAST SITE OF CONSERVATION SIGNIFICANCE



LOCATION	SOCS Number	24 (NT Parks and Conservation Masterplan Map Number 9)
	Latitude/Longitude	12° 38' South, 136° 40' East (at centre)
	Bioregion	Arnhem Coast
	Description	<p>This site covers an area of 2285 km² and includes the coastal strip of north-east Arnhem Land extending from Bremer Island and Melville Bay southwards 150 km to Cape Shield, the northern point of Blue Mud Bay. The coastline is a 570 km stretch of intricate bays and headlands as well as long sandy beaches, and many small islands of rock and sand located close to the coast are also included within the site. The coastal landforms are characterised by parabolic dune fields and beach ridge plains.</p> <p>Inland, the site comprises much of the deeply weathered granite plains, associated lateritic and bauxitic plains and plateau that are distinctive to the region, as well as intervening alluvial plains (Lynch and Wilson 1998). The western bounds of the site are not well defined.</p> <p>To the south, the site abuts Blue Mud Bay and its associated coastal floodplains, which are also recognised as a site 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)	<p>18 threatened species are reported from this site.</p> <p>Plants</p> <ul style="list-style-type: none"> ▪ Australian arenga palm <i>Arenga australasica</i> (VU/DD) ▪ <i>Hermandia nymphaeifolia</i> (-/VU) In the NT, restricted to NE Arnhem Land and Groote Eylandt. ▪ <i>Pternandra coerulescens</i> (-/VU) In the NT, restricted to NE Arnhem Land. <p>Vertebrates</p> <ul style="list-style-type: none"> ▪ Australian Bustard <i>Ardeotis australis</i> (-/VU) ▪ Emu <i>Dromaius novaehollandiae</i> (-/VU) ▪ Partridge Pigeon <i>Geophaps smithii</i> (VU/VU) ▪ Red Goshawk <i>Erythrotriorchis radiatus</i> (VU/VU) ▪ Brush-tailed Rabbit-rat <i>Conilurus penicillatus</i> (-/VU) ▪ Golden Bandicoot <i>Isodon auratus</i> (VU/EN) ▪ Northern Brush-tailed Phascogale <i>Phascogale pirata</i> (-/VU) ▪ Northern Hopping-mouse <i>Notomys aquilo</i> (VU/VU) ▪ Northern Quoll <i>Dasyurus hallucatus</i> (EN/CR) ▪ Merten's Water Monitor <i>Varanus mertensi</i> (-/VU) ▪ Flatback Turtle <i>Natator depressus</i> (VU/DD) ▪ Green Turtle <i>Chelonia mydas</i> (VU/LC) ▪ Hawksbill Turtle <i>Eretmochelys imbricata</i> (VU/DD) ▪ Olive Ridley Turtle <i>Lepidochelys olivacea</i> (EN/DD) <p>A number of these species (Rabbit-rat, Phascogale, Golden Bandicoot, Red Goshawk, Partridge Pigeon) have not been recorded from mainland NE Arnhem Land since the 1970s (Gambold <i>et al.</i> 1995), and may not persist here. The persistence of Northern Quoll since the arrival of the Cane Toad is unknown.</p> <p>Invertebrates</p> <ul style="list-style-type: none"> ▪ Gove Crow <i>Euploea alcatheae enastri</i> (EN/EN). Restricted to NE Arnhem Land (Braby 2007)
ENDEMIC SPECIES	Significance Rating	Regional Significance
	Notes	<p>Endemic to the site: The plant <i>Solanum yirkalense</i> is known only from this site.</p> <p>Endemic to the bioregion: The Gove Crow butterfly is restricted to north-east Arnhem Land and is currently known only from ~six locations (three within this site) all associated with monsoon vine forest or tall mixed paperbark (<i>Melaleuca</i> spp.) forest with rainforest elements in the understorey (Braby 2007).</p> <p>Endemic to the NT: The site includes eight vertebrate and 52 plant species endemic to the NT.</p> <p>Other: The site includes two vertebrate and 20 plant species that are, within the NT, restricted to the Arnhem Coast bioregion.</p>
WILDLIFE AGGREGATIONS	Significance Rating	International Significance
	Marine turtles	<p>The mainland beaches of north-east Arnhem Land from Cape Arnhem to Cape Shield (excluding inside the bays) provide internationally-important nesting habitat for marine turtles, including some of the densest and most extensive areas of turtle nesting in the NT (Chatto and Baker 2008). Flatback, Hawksbill and Olive Ridley Turtles have all been confirmed nesting, but the area is especially significant for high-density nesting of Green Turtles.</p> <p>Chatto and Baker (2008) also report that offshore islands along this stretch of coast, such as Bridgland and Dudley Islands, are significant for nesting Hawksbill Turtles. Occasional records of Leatherback Turtles have been reported in the waters of this area, but there are no confirmed nesting records in this site (R. Chatto, NRETAS, pers. comm.).</p>

	Seabirds	<p>The chain of small islands that run north-east of Nhulunbuy support significant colonies of breeding seabirds. Counts of 3,000 Roseate Terns and 10,000 Bridled Terns on Higginson Islet (colony # S030) in May 1994, and 2,500 Roseate Terns on East Bremer Islet (S032) in 1993 (Chatto 2001) are internationally significant (>1% global population; Dutson in prep.). Neighboring islands to the west and south of Higginson Islet, also support significant breeding populations of Roseate, Black-naped, and Bridled Terns (S033, S085, S0117) (Chatto 2001).</p> <p>The Three Hummocks Island group south of Wanyanmera Point, is also of international significance for breeding seabirds with 20,000 to 50,000 Bridled Terns (>1% global population; Dutson in prep.) recorded in 1999 (S039) (Chatto 2001). Smaller numbers of Bridled Terns and Roseate Terns have also been recorded nesting on adjacent islands (Chatto 2001).</p> <p>Chatto (2001) identified numerous other small and less significant seabird colonies on small islands associated with islands identified above, and near Port Bradshaw.</p>
	Waterbirds	No significant aggregations of waterbirds are known from this site, although Chatto (2006) does note 10 individual waterbird records of importance, including three groups of ~800 Brolga in coastal areas of the site in late 1993.
	Shorebirds	Only small and scattered areas of shorebird habitat occur in this site and just one important record of shorebirds is noted by Chatto (2003) - a flock of 3000 mixed wader species in Trial Bay.
	Other aggregations	None known
WETLANDS	Significance Rating	Not Significant
	Ramsar criteria met	Not assessed
	DIWA criteria met	Not assessed
	Notes	There are no major wetlands within the site, though local floodplains, paperbark swamps, mangrove forests and spring-fed rainforests are of regional significance.
	Rivers	No major rivers flow through the Gove Peninsula and north-east Arnhem Land coast site, but it does cover a number of short near-pristine watercourses.
FLORA	Significance Rating	National Significance
	Notes	<p>Rainforest: The north-east Arnhem Coast supports many patches of monsoon rainforest which occur behind the coastal sand dunes and are associated with springs and riparian zones. The majority of patches within this site are dry rainforest and are very small (<10 ha), but of significance are 15 patches >100 ha (Russell-Smith 1991). Rainforest within this site comprises about 10 000 ha (or 4% of the NT rainforest estate), and many rainforest plant species are only found in the NT, in the broader north-east Arnhem Land region (Liddle <i>et al.</i> 1994).</p> <p>Restricted range species: Many plant species, particularly within monsoon vine forests, are restricted within the NT to the broader north-east Arnhem Land region, and include elements common to Cape York.</p>
OTHER ENVIRONMENTAL VALUES		<p>Three Hummocks Island, Higginson Islet, and other small islets north of Nhulunbuy, are proposed to be nominated by Birds Australia as internationally-recognised <i>Important Bird Areas</i> (G. Dutson in prep.) due to the occurrence of globally significant numbers of congregatory seabirds.</p> <p>There are 54 migratory animal species recorded from this site that are listed under international conventions or bilateral agreements.</p> <p>Five sites on the North-East Arnhem Coast are listed on the Register of the National Estate for their natural values, including Rocky Bay Jungle, Dalywoi Bay Monsoon Vine Forest, Holly Inlet Monsoon Vine Forest, Rindarry Jungles, and Yalangbara Monsoon Vine Forest (Australian Heritage Council).</p> <p>The Nhulunbuy area contains the richest, most extensive and diverse coral reefs of the NT which are possibly of national significance, but ~50% were destroyed by cyclone Ingrid in March 2005 (Gomelyuk 2007). The marine areas within this site are likely to encompass other 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>
MANAGEMENT ISSUES		<p>Fire: There are clear indications that fire regimes have changed, with consequent damage to fire-sensitive vegetation (Russell-Smith and Bowman 1992 in Gambold <i>et al.</i> 1995) and, presumably, the associated fauna. In the period 1993-2004, 93% of the site was burnt in fewer than three years, and none was burnt in more than six years.</p> <p>Feral animals: Concern about growing numbers of buffalo on the Lanaphuy homelands prompted aerial surveys of buffalos in 2006. The surveys found that buffalos are present right across the Lanaphuy homelands but are concentrated on the floodplains around Blue Mud Bay where densities have increased since surveys in 1998 (Saalfeld 2006). Cane Toads were noted at survey sites in the Arafura Swamp in the 2000/01 wet season (Brennan <i>et al.</i> 2003). There is a major infestation of Yellow Crazy Ants (<i>Anoplolepis gracilipes</i>) in north-east Arnhem Land, probably originating near Nhulunbuy in the 1940s (CSIRO undated). Feral cat, dog, horse, pig and cattle also occur in the area.</p> <p>Weeds: Two Weeds of National Significance (<i>Lantana camara</i> and <i>Salvinia molesta</i>), 16 declared Category A and B weeds, and 6 undeclared but problematic environmental weeds (high priority weeds; Smith 2001) are recorded from this site. Other problematic species such as mission grass <i>Pennisetum polystachion</i>, are becoming established around the townships of Nhulunbuy and Yirrkala (Northern Land Council 2004).</p>

		<p>Other: The current operational lease of the bauxite mine extends over an area of around 205 km² with strip mining techniques used to extract the ore. Mining commenced in the early 1970s before environmental impact studies were required and, consequently, detailed baseline data is not available. Large areas are cleared for mining and while the company has invested heavily to develop and implement revegetation strategies, detailed pre-clearing flora and fauna surveys have only recently been instituted. Limited subsequent surveys have revealed at least one highly restricted and potentially threatened plant species (<i>Erythroxylum</i> sp. Cholmondely Creek (JR Clarkson 9367)).</p> <p>Dieback of Darwin stringybark <i>Eucalyptus tetradonta</i> was first reported in the Nhulunbuy Township area in 1981 and has occurred regularly since then in areas exposed to human intervention. A research project is proposed to investigate the causes and recommend management procedures (Matrix+ Consulting 2007).</p> <p>Concerns have been expressed about conservation of marine turtles in the area, with indications of high mortality associated with commercial fishing industry (Gambold <i>et al.</i> 1995) as well as “ghost nets” and other marine debris.</p> <p>While there is valuable historical data from the Gove area (Dixon and Huxley 1985; Officer 1976), systematic biological surveys in some parts of the site (Gambold <i>et al.</i> 1995) and targeted studies of some species (Woinarski <i>et al.</i> 1999), biodiversity data is sparse for much of this site.</p>
MANAGEMENT INFORMATION	NRM groups	Dhimurru Rangers (Nhulunbuy); Gamarrwa Numul Landcare (Yirkala) (Northern Land Council 2006).
	Protected areas	Dhimurru Indigenous Protected Area (1118 km ² / 49% of site), Laynhapuy Indigenous Protected Area (1160 km ² / 51% of site).
	Current management plans	<p>Site-specific plans: The Dhimurru IPA Management Plan (Dhimurru Land Management Aboriginal Corporation 2000) is currently under review http://www.dhimurru.com.au/plans.html</p> <p>Yolngu Monuk Gapu Plan of Management: A Yolngu Vision and Plan for Sea Country Management in North-east Arnhem Land, Northern Territory. (Dhimurru Land Management Aboriginal Corporation 2006) http://www.dhimurru.com.au/plans.html</p> <p>Laynhapuy Indigenous Protected Area Management Plan (draft) (Laynhapuy Homelands Association Incorporated 2006).</p> <p>National recovery plans for threatened species: Partridge Pigeon (Woinarski 2004a); Golden Bandicoot (Palmer <i>et al.</i> 2003); Northern Hopping Mouse (Woinarski 2004b); Northern Quoll (Hill and Ward in prep.); marine turtles (Environment Australia 2003); Gove Crow (Braby 2006).</p> <p>Other management plans: Australian Weeds Strategy (NRMMC 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 prep.).</p>
	Monitoring programs and research projects	<p>Ad hoc reports documenting the incidence of vegetation dieback in the Gove area have been compiled since 1981 and a formal program was established in 2007 to monitor the extent and ecological impact of dieback in affected areas and some unaffected areas (Matrix+ Consulting 2006). A detailed research project is proposed to investigate the causes of vegetation dieback in the Gove area and recommend management procedures (Matrix+ Consulting 2007).</p> <p>Monitoring of rehabilitation sites occurred following mining between 1974 -1989 and then more recently (2005-2007) at a number of rehabilitation sites and intact control sites (Woinarski <i>et al.</i> 2005; Crase <i>et al.</i> 2006; Crase <i>et al.</i> 2007).</p> <p>Long-term vertebrate fauna monitoring in post-mining rehabilitation sites and nearby unmined sites (Woinarski <i>et al.</i> 2008).</p> <p>Annual monitoring of vegetation characteristics at 12 riparian sites on and around the Alcan mining lease has occurred since 2004 to determine the impact of groundwater extraction (Crase <i>et al.</i> 2006).</p> <p>Indigenous rangers are involved in a range of programs to monitor marine turtles and marine debris including: annual marine debris surveys (NRETA 2007); annual helicopter surveys of fishing nets along the Dhimurru IPA coast since 1996; monitoring of turtle nest predation on Bremer Island commenced in 2007 under the NAILSMA Dugong and Marine Turtle Project; and irregular survey and collection of fishing nets under the Carpentaria Ghost Net program since 2005. Plans are also in place to attach satellite transmitters to Olive Ridley turtles when they are found and released from nets (J. Dermer, Dhimurru Land Management Aboriginal Corporation, pers. comm.).</p> <p>Surveys of Gove Crow Butterfly habitat commenced in 2006 with an emphasis on reassessing known sites, finding new sites, and assessing threatening processes (M. Braby, NRETAS, pers. comm.).</p> <p>Permanent sites have been established off the coast of Nhulunbuy to monitor coral health (NRETA 2007).</p> <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>
Management recommendations	<p>Continue to work with Dhimurru Land Management Corporation and Lanypuy Homelands Association Incorporated to resource and implement programs under the respective IPA management plans in accordance with the section 73 agreement (NRETA 2005).</p> <p>Support community ranger groups and assist with the development of their management capacity including a structured training program (NRETA 2005).</p> <p>Maintain the current Parks and Wildlife ranger presence and operational capacity providing wildlife management and coordination of training at Nhulunbuy (NRETA 2005).</p> <p>Monitor seabird nesting in significant colonies (G. Dutson in prep.).</p>	

KEY REFERENCES	Papers and reports	<p>Chatto, R. and Baker, B. (2008). <i>The distribution and status of marine turtle nesting in the Northern Territory</i>. Technical Report 77. Parks and Wildlife Service, Northern Territory Department of Natural Resources, Environment & the Arts, Darwin.</p> <p>Chatto, R. (2001). <i>The distributions and status of colonial breeding seabirds in the Northern Territory</i>. Technical Report 70, Parks and Wildlife Commission of the Northern Territory, Darwin. 206pp.</p> <p>Gambold, N., Woinarski, J.C., Brennan, K., Jackson, D., Mununggiritj, N., Wunungmurra, B., Yunupingu, D., Burarrwanga, N., Wearne, G. (1995). <i>Fauna survey of the proposed Nanydjaka Reserve (Cape Arnhem Peninsula) with reference to the fauna of north-eastern Arnhem Land</i>, Conservation Commission of the Northern Territory, Darwin.</p> <p>Officer, H.R. (1976). Ten days of observations of the birds of Gove Peninsula. <i>Australian Bird Watcher</i> 6, 223-228.</p> <p>Woinarski, J., Hokkanen, R., Milne, D., and Armstrong, M. (2008). <i>Long-term vertebrate fauna monitoring: Rio Tinto Alcan Gove Rehabilitation Monitoring</i>. Report to Matrix+ (Department of Natural Resources, Environment and The Arts, Darwin.)</p>
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