

## Tiwi Islands

### Location and Description

The Tiwi Islands lie 20 km north of Darwin and include Australia's second and fifth largest islands - Melville and Bathurst Islands, respectively. They receive the Northern Territory's highest annual rainfall (average >1400 mm) and are dominated by tall eucalypt forest on sandy and lateritic plains and rises. Rainforest patches occur in association with perennial freshwater springs on the islands, and the coast is lined with long beaches and rocky headlands, interspersed with mangrove-lined creeks and rivers.

### Tenure and Land Use

The Tiwi Islands are Aboriginal freehold land owned by the Tiwi Aboriginal Land Trust. The land mainly supports Indigenous uses, but plantation forestry is increasing in area on Melville Is and may occur on Bathurst Is in the future. Other uses include tourism, mining, and commercial fisheries.

### Significance Rating

International Significance

### Ecological Values

Partly because of their isolation and because they occupy a climatic extreme (high rainfall), the Tiwi Islands support many species not recorded anywhere else in the Northern Territory (or in the world), as well as a number of range-restricted species. The Tiwi Islands contain the Territory's best-developed (tallest and with greatest basal area) eucalypt forests, along with an unusually high density and extent of rainforests. The coasts support important nesting sites for marine turtles, internationally significant seabird rookeries, and some major aggregations of migratory shorebirds. Some 19 plant and 19 animal species found on the Tiwi Islands are listed as threatened at the Northern Territory or National level. The isolation of the Tiwi Islands also provides some protection for their plants and animals from some processes affecting many habitats on the Northern Territory mainland (such as Cane Toads and some invasive exotic plants).

### Management Issues

The spread of invasive exotic grasses may affect a number of ecosystems on the islands and will potentially change the fire regime. Feral animals (including exotic ants, Water Buffalo, cattle, pig and cat) are also affecting the conservation values of the Islands, and there are significant, and increasing, areas of intensive development associated with a major plantation forestry industry.

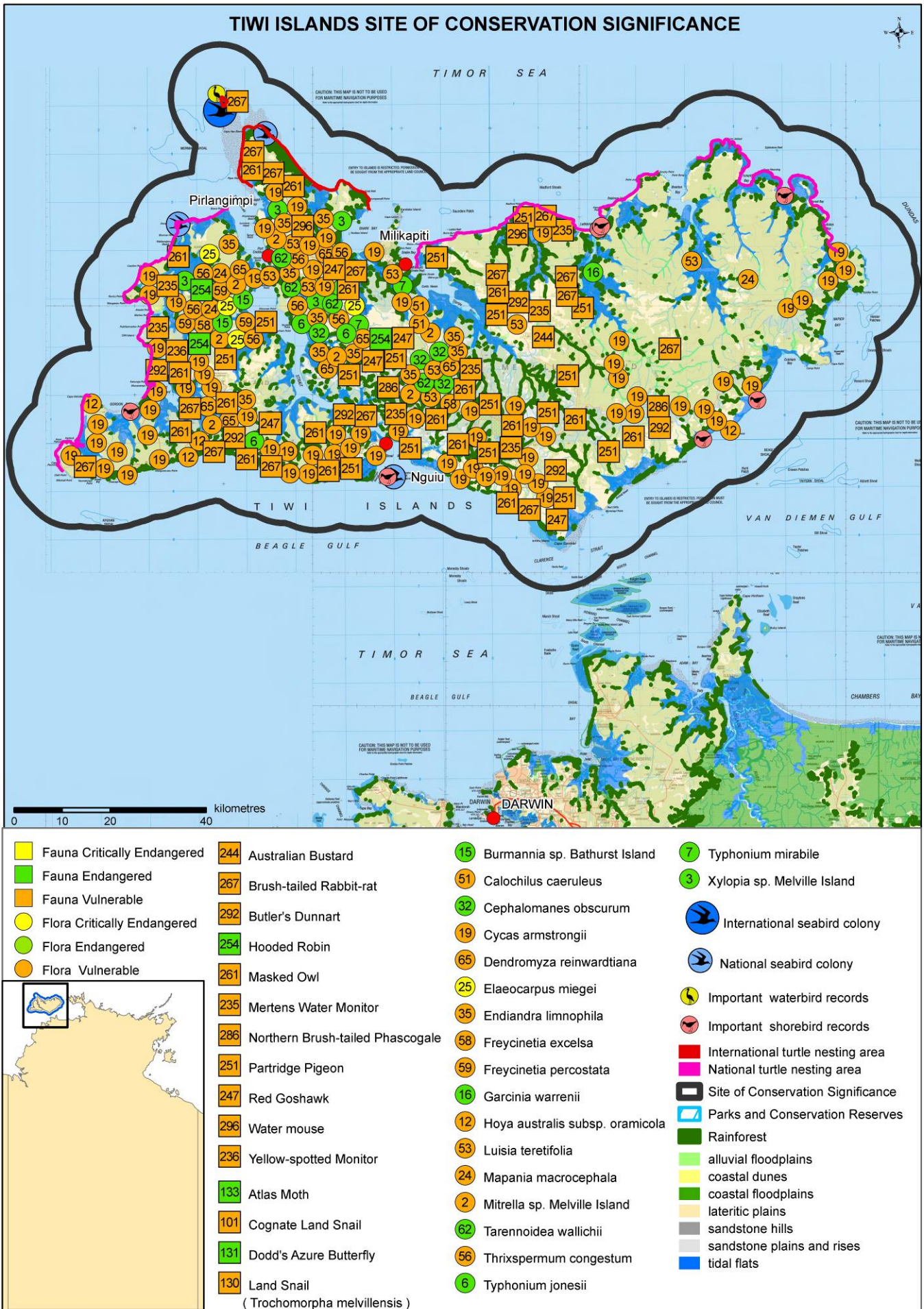


### Condition

Most vegetation is relatively extensive and intact. The exceptions to this are relatively small areas of modified landscapes around townships, and increasingly larger areas of forestry plantations on Melville Island.

### Current Conservation Initiatives

The Tiwi Land Council has developed a natural resource management strategy with a focus on managing threats to biodiversity and building local capacity to manage natural resources. Aboriginal land and sea management activities include coastal patrols, marine debris surveys, implementation of the Cane Toad Action Plan, and turtle management. Populations of a number of threatened plants and animals are being monitored, and there is active management of some weeds, feral animals and fire by Indigenous rangers, including a joint pest ant eradication project with CSIRO, which aims to control African Big-headed Ants and Tropical Fire Ants.



TIWI ISLANDS - SITE OF CONSERVATION SIGNIFICANCE

<b>LOCATION</b>	<b>SOCS Number</b>	9 (NT Parks and Conservation Masterplan Map Number 2)
	<b>Latitude/Longitude</b>	11° 33' South, 130° 47' East (at centre)
	<b>Bioregion</b>	Tiwi Cobourg
	<b>Description</b>	<p>This site includes Melville and Bathurst islands and some small islands off their northern and southern shores. The site encompasses a terrestrial area of 7521 km<sup>2</sup> and is dominated by lateritic and sandstone plains and rises (5980 km<sup>2</sup>). The coastline is a combination of long sandy beaches, rocky headlands and mangrove forests, particularly lining the estuaries and inlets.</p> <p>Together with the Cobourg Peninsula they form the Tiwi Cobourg Bioregion. Cobourg Peninsula is also recognised as a site of high conservation significance in the NT.</p>
<b>THREATENED SPECIES</b>	<b>Significance Rating</b>	<b>International Significance</b>
	<p><b>Threatened plants and animals</b> (Listings at National/NT level <b>CR</b> - Critically Endangered, <b>EN</b> - Endangered, <b>VU</b> - Vulnerable, <b>NT</b> - Near Threatened, <b>LC</b> - Least Concern, <b>DD</b> - Data Deficient)</p>	<p>38 threatened species are reported from this site.</p> <p><b>Plants</b></p> <ul style="list-style-type: none"> <li>▪ <i>Burmanningia</i> sp. Bathurst Island (R.J.Fensham 1021) (EN/EN)</li> <li>▪ <i>Calochilus caeruleus</i> (-/VU)</li> <li>▪ <i>Cephalomanes obscurum</i> (-/EN)</li> <li>▪ <i>Cycas armstrongii</i> (-/VU)</li> <li>▪ <i>Dendromyza reinwardtiana</i> (-/VU)</li> <li>▪ <i>Elaeocarpus miegei</i> (-/CR)</li> <li>▪ <i>Endiandra limnophila</i> (-/VU)</li> <li>▪ <i>Freycinetia excelsa</i> (-/VU)</li> <li>▪ <i>Freycinetia percostata</i> (-/VU)</li> <li>▪ <i>Garcinia warrenii</i> (-/EN)</li> <li>▪ <i>Hoya australis</i> subsp. <i>oramicola</i> (VU/VU)</li> <li>▪ <i>Luisia teretifolia</i> (-/VU)</li> <li>▪ <i>Mapania macrocephala</i> (-/VU)</li> <li>▪ <i>Mitrella tiwiensis</i> (VU/VU)</li> <li>▪ <i>Tarennoidea wallichii</i> (-/EN)</li> <li>▪ <i>Thrixspermum congestum</i> (-/VU)</li> <li>▪ <i>Typhonium jonesii</i> (EN/EN)</li> <li>▪ <i>Typhonium mirabile</i> (EN/EN)</li> <li>▪ <i>Xylopia monosperma</i> (EN/EN)</li> </ul> <p><b>Vertebrates</b></p> <ul style="list-style-type: none"> <li>▪ Australian Bustard <i>Ardeotis australis</i> (-/VU)</li> <li>▪ Partridge Pigeon <i>Geophaps smithii</i> (VU/VU)</li> <li>▪ Red Goshawk <i>Erythrotriorchis radiatus</i> (VU/VU)</li> <li>▪ Tiwi Hooded Robin <i>Melanodryas cucullata melvillensis</i> (EN/EN) This subspecies is restricted to the Tiwi Islands and has not been recorded since 1992 (Woinarski <i>et al.</i> 2007).</li> <li>▪ Tiwi Masked Owl <i>Tyto novaehollandiae melvillensis</i> (EN/EN)</li> <li>▪ Brush-tailed Rabbit-rat <i>Conilurus penicillatus</i> (-/VU)</li> <li>▪ Butler's Dunnart <i>Sminthopsis butleri</i> (VU/VU)</li> <li>▪ False Water-rat <i>Xeromys myoides</i> (VU/DD)</li> <li>▪ Northern Brush-tailed Phascogale <i>Phascogale pirata</i> (-/VU)</li> <li>▪ Merten's Water Monitor <i>Varanus mertensi</i> (-/VU)</li> <li>▪ Yellow-spotted Monitor <i>Varanus panoptes</i> (-/VU)</li> <li>▪ Flatback Turtle <i>Natator depressus</i> (VU/DD)</li> <li>▪ Green Turtle <i>Chelonia mydas</i> (VU/LC)</li> <li>▪ Hawksbill Turtle <i>Eretmochelys imbricata</i> (VU/DD)</li> <li>▪ Olive Ridley Turtle <i>Lepidochelys olivacea</i> (EN/DD)</li> </ul> <p><b>Invertebrates</b></p> <ul style="list-style-type: none"> <li>▪ Cognate Land Snail <i>Amphidromus cognatus</i> (-/VU)</li> <li>▪ Atlas Moth <i>Attacus wardi</i> (-/EN)</li> <li>▪ Dodd's Azure Butterfly <i>Ogyris iphis</i> (-/EN)</li> <li>▪ Land Snail <i>Trochomorpha melvillensis</i> (-/VU)</li> </ul>

## TIWI ISLANDS - SITE OF CONSERVATION SIGNIFICANCE

ENDEMIC SPECIES	<b>Significance Rating</b>	<b>National Significance</b>
	<b>Notes</b>	<p><b>Endemic to the site:</b> This site supports six plant species only recorded from the Tiwi Islands and two new plant species that are considered to be restricted to the Tiwi Islands but are yet to be formally described.</p> <p>Substantial levels of endemism are thought to be present in land snails on the Tiwi Islands, two dragonfly species appear restricted to Tiwi Islands, and one skipper butterfly is known only from Bathurst Island (Woinarski <i>et al.</i> 2003b).</p> <p>While no vertebrate species are considered endemic to the Tiwi Islands, there is a high level of endemism at the subspecies level. Eight subspecies of birds (such as the Tiwi subspecies of the Hooded Robin <i>Melanodryas cucullata melvillensis</i> and Masked Owl <i>Tyto novaehollandiae melvillensis</i>) and two subspecies of mammals (Brush-tailed Rabbit-rat and Black-footed Tree-rat) are considered to be restricted to the Tiwi Islands (Woinarski <i>et al.</i> 2003b).</p> <p><b>Endemic to the bioregion:</b> This site includes a large percentage of the Tiwi-Cobourg bioregion, and no species other than those listed above are endemic to the bioregion.</p> <p><b>Endemic to the NT:</b> 85 plant and 9 vertebrate species recorded in this site are NT endemics.</p> <p><b>Other:</b> All NT records of Butler's Dunnart are from this site and persistence of the species in the Kimberley is uncertain.</p> <p>24 plant species are known in the NT only from the Tiwi Islands but also occur in northern Queensland and/or other areas.</p> <p>About 10% of the 151 known ant species on Tiwi Islands are not known from the NT mainland (Woinarski <i>et al.</i> 2003a).</p>
WILDLIFE AGGREGATIONS	<b>Significance Rating</b>	<b>International Significance</b>
	<b>Marine turtles</b>	Sandy beaches on the Tiwi Islands, particularly the west coast of Bathurst Island and the north coast of Melville Island, are highly important for marine turtle nesting. Nesting is dominated by Flatback and Olive Ridley Turtles, but Green Turtles and Hawksbill Turtles also nest on Tiwi beaches. Seagull Island and the north-west coast of Melville Island are notable for significant numbers of nesting Olive Ridley Turtles (Chatto and Baker 2008). Here we consider the site of International significance to marine turtles.
	<b>Seabirds</b>	Five seabird breeding colonies are reported on small off-shore islands within this site (Chatto 2001). Counts of about 60 000 Crested Terns (Chatto 2001; Dutson 2006) in one colony on Seagull Island (S009), off the north-west coast of Melville Island, are internationally significant (>1% global population; G. Dutson in prep.) and believed to be the world's largest breeding colony of this species (G. Dutson in prep.). Three colonies (S018, S138, S146) are considered of National significance for breeding records of Little Tern (Chatto 2001).
	<b>Waterbirds</b>	Large numbers of waterbirds are not reported from this site, and Chatto (2006) notes only one waterbird record of regional importance.
	<b>Shorebirds</b>	This site comprises extensive areas of tidal flats, particularly on the south-east of Melville Island. The highest total count is 40 000 shorebirds in 1993 and this was dominated by Great Knots (Chatto 2003). A record of 12 000 Great Knots (an estimation based on aerial counts in 1993; Chatto 2003) is internationally significant (>1% global population; G. Dutson in prep.). Other abundant species reported from the site include Red-necked Stints, Greater and Lesser Sand Plovers and Bar-tailed Godwits (Chatto 2003). Seven important shorebird records are identified from this site (R. Chatto, NRETAS unpubl.), including high counts of mixed wader species and counts of other species that are regionally important.
	<b>Other aggregations</b>	None known
WETLANDS	<b>Significance Rating</b>	<b>Regional Significance</b>
	<b>Ramsar criteria met</b>	Not assessed
	<b>DIWA criteria met</b>	Not assessed
	<b>Notes</b>	The Islands have extensive areas of saline wetlands adjacent to the coast, and there are also numerous freshwater wetlands scattered on the islands, but none are large compared to many of the mainland floodplains.
	<b>Rivers</b>	Bathurst Island includes few large watercourses but Melville Island includes some substantial ones, with the largest being the Johnson and Jessie Rivers, extending up to about 40 km, of which about half is tidal (Woinarski and Baker 2002).
FLORA	<b>Significance Rating</b>	<b>National Significance</b>
	<b>Notes</b>	<p><b>Rainforest:</b> Compared to the NT mainland, there is an unusually high density and extent of rainforest on the Tiwi Islands (Woinarski <i>et al.</i> 2003a). The islands comprise almost 18 000 ha of rainforest or 6% of the NT rainforest estate. The rainforest occurs in coastal areas and along watercourses on both islands and is mostly the dry and riparian rainforest types, although significant areas of spring-fed rainforest also occur. Most rainforest patches are &lt;100 ha, but 16 patches are &gt;100 ha (Russell-Smith 1991).</p> <p><b>Restricted vegetation communities:</b> Distinctive "treeless plains" occur amongst the tall eucalypt forest on both Bathurst and Melville Island (Woinarski <i>et al.</i> 2003a).</p>

TIWI ISLANDS - SITE OF CONSERVATION SIGNIFICANCE

OTHER ENVIRONMENTAL VALUES		<p>The Tiwi Islands are proposed to be nominated by Birds Australia as an internationally-recognised <i>Important Bird Area</i> (G. Dutson in prep.) due to the occurrence of numerous endemic, restricted range and threatened bird species. Seagull Island is also proposed to be nominated due to occurrence of globally significant numbers of Crested Terns.</p> <p>55 species recorded from this site are listed under international conventions or bilateral agreements protecting migratory animals.</p> <p>The Tiwi Islands support abundant and widespread mammal fauna in contrast to the mainland where many species have been substantially reduced in abundance or distribution (Firth <i>et al.</i> 2006).</p> <p>An important conservation value of the Tiwi Islands is some level of protection to the plants and animals from processes affecting mainland areas (Woinarski <i>et al.</i> 2003b).</p> <p>Ten vine thickets on the Tiwi Islands are listed on the Register of the National Estate for their natural values including: Big Pig Jungle, Ilinga Jungle, Hanguana Jungle, Gully Gully Jungle, Tarracumbie Creek Jungle, Jump Up Jungles, Imanawudi Jungle, Third Spring Jungle, East Tjipripu Spring Jungle and Mangkipp Jungle (Australian Heritage Council).</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>
MANAGEMENT ISSUES		<p><b>Fire:</b> In the period 1993-2004, 35% of the site was burnt in fewer than three years, and 12% was burnt in more than six years. Much of the fire control on Melville Is. is currently focused on protection of forestry plantations.</p> <p><b>Feral animals:</b> African Big-headed Ants and Tropical Fire Ants are present on the Tiwi Islands (CSIRO undated), as are feral buffalo, cattle, horse, pig, dog and cat. Pigs occur on Bathurst Is. and only a small section of Melville Is., but recent reports suggest that they are increasing in range on Melville Is.</p> <p><b>Weeds and invasive exotic plants:</b> Two Weeds of National Significance (<i>Lantana camara</i> and <i>Mimosa pigra</i>), 17 declared Category A and B weeds, and seven undeclared but problematic environmental weeds (high priority weeds: Smith 2001) are recorded from the Tiwi Islands. Weeds are mostly confined to the township and forestry areas, but there has been a very substantial expansion of weeds from increased disturbance and traffic associated with forestry.</p> <p>The grasses <i>Pennisetum polystachion</i> and <i>Megathyrsus maximus</i> are a particular threat to the conservation values of the Tiwi Islands due to their capacity for rapid spread and high biomass resulting in increased fire intensity. Similarly, <i>Andropogon gayanus</i> is a serious threat that could escalate if current work towards eradication on the Islands is relaxed. Spread of the major plantation species such as <i>Acacia mangium</i> away from plantations is of potential concern.</p> <p><b>Other:</b> Great Southern Limited has approvals to clear 33 000 ha for plantation forestry on Melville Is. Forestry operations have led to substantial loss of native vegetation, disturbance for roads and other infrastructure, and may potentially affect groundwater supplies to wet rainforest. Sand mining occurs on both islands and causes localised intensive disturbance.</p>
MANAGEMENT INFORMATION	NRM groups	Land Management Team and Tiwi Marine Rangers, Tiwi Land Council.
	Protected areas	The site is not included within the formal network of protected areas in the NT.
	Current management plans	<p><b>Site-specific plans:</b> Tiwi Islands Regional Natural Resource Management Strategy (Tiwi Land Council 2004) <a href="http://www.tiwilandcouncil.net.au/Land/Land_home-all.htm">http://www.tiwilandcouncil.net.au/Land/Land_home-all.htm</a></p> <p>Biodiversity Conservation on the Tiwi Islands, Northern Territory: Part 3. Management and Planning for biodiversity conservation (Woinarski <i>et al.</i> 2003c).</p> <p><b>National recovery plans for threatened species:</b> marine turtles (Environment Australia 2003); threatened plants of the Tiwi Islands (Liddle <i>et al.</i> 2008); Partridge Pigeon and Tiwi Masked Owl (Woinarski 2004a); Butler's Dunnart (Woinarski 2004b); Red Goshawk (Baker-Gabb in prep.); False Water-rat (Qld EPA in prep.).</p> <p><b>Other management plans:</b> 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); A management program for cycads (PWCNT 1997); FIREPLAN: Fire management for the savanna community (Russell-Smith <i>et al.</i> in prep.).</p>
Monitoring programs and research projects	<p>Threatened plant populations and the condition of rainforest patches are being monitored at permanent plots on the Tiwi Islands (D. Liddle, NRETAS unpubl.).</p> <p>A monitoring program for Butler's Dunnart is currently being implemented (S. Ward, NRETAS, pers. comm.).</p> <p>Populations of threatened species, including Tiwi Masked Owl, Red Goshawk and Partridge Pigeon are being monitored as part of forestry operations (Great Southern 2007).</p> <p>Research on nesting and foraging behaviour of Olive Ridley turtles in this site have recently been reported (Whiting <i>et al.</i> 2007a; Whiting <i>et al.</i> 2007b).</p> <p>Irregular counts of seabirds are conducted at Seagull Island (S. Ward, NRETAS, pers. comm.).</p> <p>Indigenous rangers conduct annual surveys of marine debris on selected sandy beaches as part of the NT Marine Debris Monitoring program (NRETA 2007). They also carry out weed monitoring and control, and monitor a network of Cane Toad traps under the Tiwi Land Council's Cane Toad Action Plan.</p> <p>Major wildlife surveys of the Tiwi Islands were conducted in 2000 and 2001 (Woinarski <i>et al.</i> 2003a; Woinarski <i>et al.</i> 2003b; Woinarski <i>et al.</i> 2003c).</p> <p>Irregular aerial surveys of feral animals (Woinarski and Baker 2002).</p> <p>Fire in the tropical savannas is mapped continuously under the North Australia Fire Information Project <a href="http://www.firenorth.org.au/nafi/app/init.jsp">http://www.firenorth.org.au/nafi/app/init.jsp</a></p>	

TIWI ISLANDS - SITE OF CONSERVATION SIGNIFICANCE

KEY REFERENCES	Management recommendations	<p>In conjunction with the Tiwi Land Council, assist traditional owners and other landholders to undertake conservation planning in accordance with the Tiwi Islands Natural Resource Management Strategy to identify potential reserves and conservation management areas (NRETA 2005).</p> <p>In conjunction with Fisheries Group (DPIFM), landholders and Tiwi Land Council continue to provide financial and technical support to continue building capacity of landholders and community based rangers (NRETA 2005).</p> <p>Implement recommendations for monitoring the conservation values of the Tiwi Islands as reported in Woinarski <i>et al.</i> (2003c).</p> <p>Establish reserve(s) or IPA on Tiwi Islands (Woinarski and Baker 2002).</p> <p>Ensure retention of all rainforest patches (Woinarski and Baker 2002).</p> <p>Establish monitoring programs for threatened species (Woinarski and Baker 2002).</p> <p>Control weeds and feral animals (Woinarski and Baker 2002).</p> <p>Minimise impacts of exploitative land use (Woinarski and Baker 2002).</p> <p>Implement a robust groundwater monitoring program and manage groundwater in accordance with the findings of the monitoring program.</p> <p>Additional conservation management actions and priorities including reserve consolidation, management of threatened species, and other natural resource management activities are summarized in Woinarski and Baker (2002; Table 8 p.47).</p>
	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 &amp; the Arts, Darwin.</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>Chatto, R. (2001). <i>The distribution 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>Dutson, G. (2006). <i>Crested Terns at Seagull Island, Tiwis, NT</i>. Unpublished report.</p> <p>Liddle, D.T., Gibbons, A. and Taylor, R. (in prep). <i>'Recovery plan for the threatened plants of the Tiwi Islands in the Northern Territory of Australia 2008-2013'</i>. Northern Territory Department of Natural Resources, Environment and the Arts.</p> <p>Russell-Smith, J. (1991). Classification, species richness, and environmental relations of monsoon rain forest in northern Australia. <i>Journal of Vegetation Science</i> 2: 259-278.</p> <p>Woinarski, J., Brennan, K., Cowie, I., Kerrigan, R., Hempel, C. (2003a). <i>Biodiversity Conservation on the Tiwi Islands, Northern Territory: Part 1. Environments and plants</i>. Department of Infrastructure, Planning and Environment, Darwin.</p> <p>Woinarski, J., Brennan, K., Hempel, C., Armstrong, M., Milne, D., Chatto, R. (2003b). <i>Biodiversity Conservation on the Tiwi Islands, Northern Territory: Part 2. Fauna</i>. Department of Infrastructure, Planning and Environment, Darwin.</p> <p>Woinarski, J., Hadden, K., Hicks, J., and McLeod, D. (2003c). <i>Biodiversity Conservation on the Tiwi Islands, Northern Territory: Part 3. Management and Planning for biodiversity conservation</i>. Department of Infrastructure, Planning and Environment, Darwin.</p> <p>Woinarski, J. and Baker, B. (2002). <i>Biodiversity Audit - bioregional case study: Tiwi-Cobourg bioregion, Northern Territory</i>. In J. Woinarski (ed.) <i>Biodiversity Audit - bioregional summaries</i>. A report to the National Land &amp; Water Audit. Parks and Wildlife Commission of the Northern Territory, Darwin.</p>
	Contributors	



Melville Island wetland, Tiwi Islands (Photo: Simon Ward)