Shoal Bay

Location and Description

Shoal Bay is immediately north-east of Darwin City. The Site comprises the lower reaches of the Howard River and other small tidal creeks that empty into Hope Inlet and the Shoal Bay. This Site differs from most other bays in the Top End in that no large rivers (or freshwater coastal floodplains) are associated with it. Extensive mud and sand flats are the major feature of Shoal Bay, with much of the bay exposed at low tide. The Site includes a number of swamps and remnants of monsoon vine forest.

Tenure and Land Use

The majority of this Site is freehold land and a large area is also dedicated conservation reserve. Small portions of the Site are vacant Crown land and government land. Approximately 40% of this Site is managed as conservation reserves and used for conservation and recreation, and other uses include defence and urban housing.

Significance Rating

International Significance

Ecological Values

The extensive tidal flats in Shoal Bay provide an important feeding and roosting area for migratory shorebirds in their non-breeding season. Up to 5 000 waterbirds are known to aggregate on small freshwater wetlands inland of the tidal flats late in the dry season as more extensive coastal floodplains dry out across the Top End. Numerous patches of rainforest occur around the margin of the tidal flats. A high number of threatened species are reported from this Site, including three plants, ten vertebrates and one invertebrate.

Management Issues

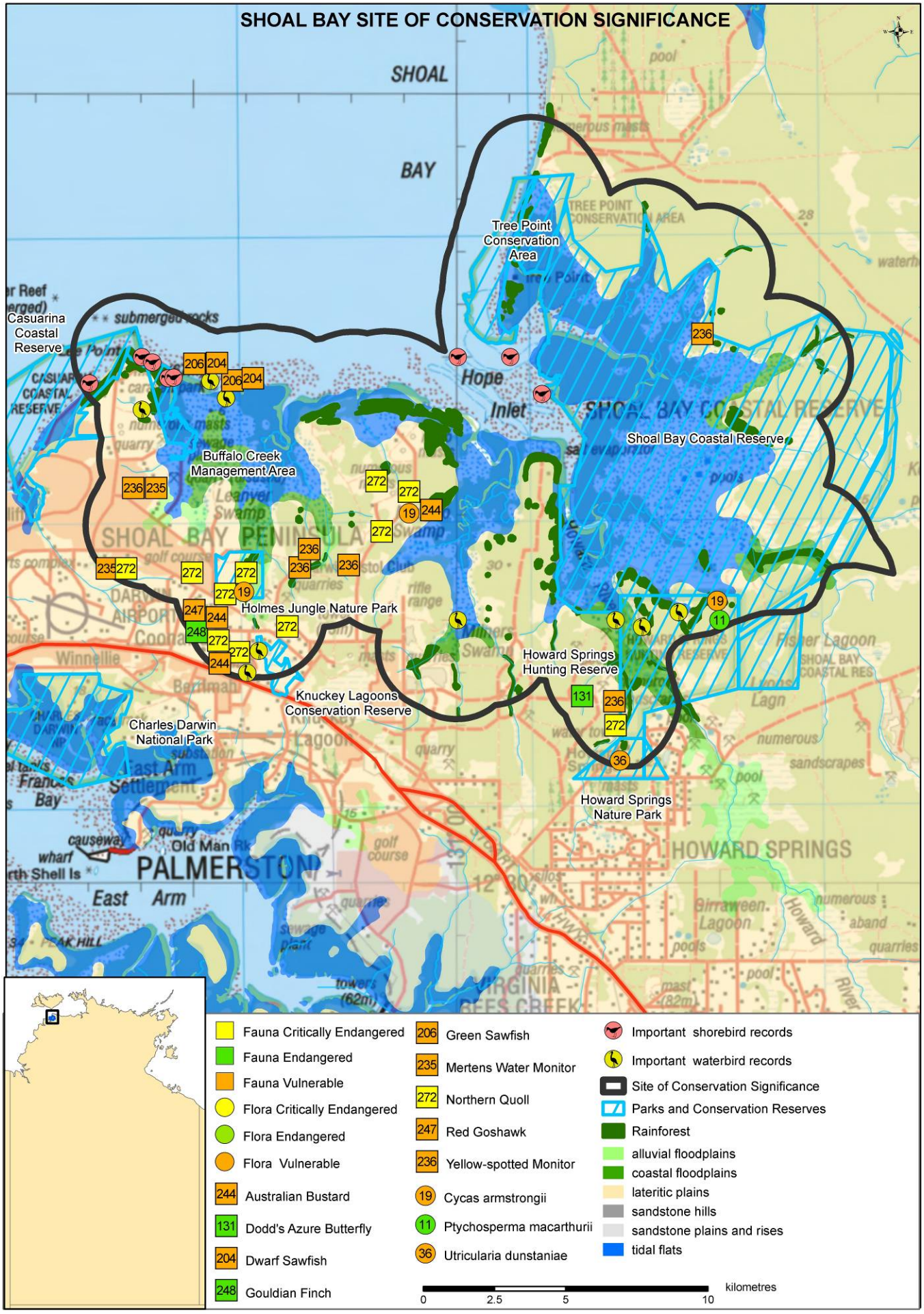
Urbanisation is impacting on this Site. Local swamps have been drained for urban development and further developments are proposed as Darwin continues to expand. Other management concerns include exotic plants and animals, frequent fires, and uncontrolled recreational use of the area.

Condition

Parts of the Site are degraded due to heavy disturbance by recreational users.

Current Conservation Initiatives

A regional plan of management has been developed for Darwin Harbour and its catchment, including Shoal Bay and the Howard River catchment, although specific initiatives required to protect the conservation values of the Site have not been identified. Members of the Northern Territory Field Naturalists Club periodically survey migratory shorebirds present around Buffalo Creek.


SHOAL BAY SITE OF CONSERVATION SIGNIFICANCE
SHOAL
BAY
Tree Point Conservation Area
Casuarina Coastal Reserve
Hope Inlet
Shoal Bay Coastal Reserve
Buffalo Creek Management Area
SHOAL BAY PENINSULA
Holmes Jungle Nature Park
Howard Springs Hunting Reserve
Knuckey Lagoons Conservation Reserve
Charles Darwin National Park
Howard Springs Nature Park
PALMERSTON
HOWARD SPRINGS
East Arm
Fauna Critically Endangered
Fauna Endangered
Fauna Vulnerable
Flora Critically Endangered
Flora Endangered
Flora Vulnerable
244 Australian Bustard
131 Dodd's Azure Butterfly
204 Dwarf Sawfish
248 Gouldian Finch
206 Green Sawfish
235 Mertens Water Monitor
272 Northern Quoll
247 Red Goshawk
236 Yellow-spotted Monitor
19 Cycas armstrongii
11 Ptychosperma macarthurii
36 Utricularia dunstaniae
Important shorebird records
Important waterbird records
Site of Conservation Significance
Parks and Conservation Reserves
Rainforest
alluvial floodplains
coastal floodplains
lateritic plains
sandstone hills
sandstone plains and rises
tidal flats
0 2.5 5 10
kilometres

LOCATION	**SOCS Number**	8 (Not listed in the NT Parks and Conservation Masterplan)
	Latitude/Longitude	12º 22´ South, 131º 1´ East (at centre)
	Bioregion	Darwin Coastal
	Description	This site includes the tidal flats (107 km²) associated with the lower reaches of the Howard River and other small tidal creeks flowing into Shoal Bay between Lee Point and Tree Point, plus a buffering terrestrial area (205 km²). Sandy beaches and a chenier dune system occur along the shoreline close to Lee Point, freshwater swamps (including Leanyer, Milners and Noogoo) are found around the margin of the site, but unlike many other coastal areas around the Top End the site has only a limited area of freshwater floodplain. Nearby Darwin Harbour and the Howard sand sheets are also recognised as sites of high conservation significance in the NT.
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)	14 threatened species are reported from this site. **Plants** ▪ *Cycas armstrongii* (-/VU) ▪ *Ptychosperma macarthurii* (EN/EN) ▪ *Utricularia dunstaniae* (-/VU) **Vertebrates** ▪ Australian Bustard *Ardeotis australis* (-/VU) ▪ Gouldian Finch *Erythrura gouldiae* (EN/EN) ▪ Red Goshawk *Erythrotriorchis radiatus* (VU/VU) ▪ Northern Quoll *Dasyurus hallucatus* (EN/CR) ▪ Merten's Water Monitor *Varanus mertensi* (-/VU) ▪ Yellow-spotted Monitor *Varanus panoptes* (-/VU) ▪ Flatback Turtle *Natator depressus* (VU/DD) ▪ Olive Ridley Turtle *Lepidochelys olivacea* (EN/DD) ▪ Dwarf Sawfish *Pristis clavata* (-/VU) ▪ Green Sawfish *Pristis zijsron* (-/VU) **Invertebrates** ▪ Dodd's Azure Butterfly *Ogyris iphis* (-/EN)
ENDEMIC SPECIES	**Significance Rating**	**Not Significant**
	Notes	**Endemic to the bioregion:** One vertebrate (*Ramphotyphlops nema)* and two plant species (*Utricularia holtzei* and *Typhonium praetermissum*) recorded in this site are only known from the Darwin Coastal bioregion. **Endemic to the NT:** 61 plant species and nine vertebrates recorded in this site are endemic to the NT. **Other:** Seven plants recorded in the site are restricted to the Darwin Coastal bioregion within the NT but are recorded in other states. There is also a collection of records of vagrant bird species from Darwin Harbour/Shoal Bay that have not been recorded elsewhere in the NT.
WILDLIFE AGGREGATIONS	**Significance Rating**	**International Significance**
	Marine turtles	This site does not include extensive areas of sandy beach and is likely to be only used infrequently by marine turtles for nesting (Chatto and Baker in prep).
	Seabirds	No seabird breeding colonies are known from Shoal Bay (Chatto 2001).
	Waterbirds	This site lacks a large area of freshwater wetland and supports relatively low numbers (~5000) of waterbirds but a record of 2000 Rajah Shelducks (Chatto 2006) is nationally significant (>1% total population; Wetlands International 2006). Chatto (2006; R. Chatto NRETAS unpubl.) notes 16 important waterbird records for this site, including high counts of Magpie Geese, Brolga and other species that are regionally important. No large or regularly used waterbird breeding colonies are known from the site (Chatto 2006).
	Shorebirds	Sand and mud flats in Shoal Bay are an important feeding and roosting area for shorebirds. Counts are regularly >5500 shorebirds (Chatto 2003) and a high count of 7500+ shorebirds is recorded from December 2007 (A & S. Keates unpubl.). Great Knots are one of the most abundant species at this site and maximum counts of 6050 and 4400 in 2007 (A & S. Keates unpubl.) are internationally significant (> 1% East Asian-Australasian Flyway population; Bamford *et al.* 2008). 12 important shorebird records are identified from this site (R. Chatto NRETAS unpubl.), including roosts of >2000 mixed wader species and counts of other species that are regionally important.
	Other aggregations	None known
WETLANDS	**Significance Rating**	**National Significance**
	Ramsar criteria met	Not assessed
	DIWA criteria met	Part of this site is listed as a wetland of national significance in the Directory of Important Wetlands in Australia (DIWA: NT032 Shoal Bay - Micket Creek). The site meets criteria 3 and 6 and includes DIWA wetland types: A6, A7, A8, A9, and A11.

	Notes	The area is an example of a spring-fed coastal wetland system (DIWA). The numerous freshwater lagoons within the site, and within the broader Darwin region, are identified and mapped in a report by Schult (2005).
	Rivers	The Howard River flows into Shoal Bay, as well as several other coastal creeks. It is a relatively small, spring-fed NT river.
FLORA	**Significance Rating**	**Regional Significance**
	Notes	**Rainforest:** About 1000 ha of rainforest (or 0.4% of the NT rainforest estate) occur as scattered patches around the margin of the tidal flats in this site. Most patches are <10 ha in size but two patches are each >100 ha (Russell-Smith 1991).
OTHER ENVIRONMENTAL VALUES		Six sites in Shoal Bay are listed on the Register of the National Estate for their natural values including: the Holmes Jungle and Swamp and Micket Creek Complex, Darwin Foreshores, Garden Point Beach, Casuarina Beach-Lee Point-Buffalo Creek Area, Leanyer Swamp, and the Howard Springs Nature Park (Australian Heritage Council). Shoal Bay is identified as an internationally important site for migratory shorebirds in the East Asian-Australasian Flyway (Bamford *et al.* 2008). Shoal Bay is proposed to be nominated by Birds Australia as an internationally-recognised *Important Bird Area* due to the occurrence of Chestnut Rails and globally significant numbers of Great Knots (G. Dutson in prep.). The Chestnut Rail is a range restricted species that is reported from mangroves in this site (Chatto 2006). 75 species recorded from this site are listed under international conventions or bilateral agreements protecting migratory animals. 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.).
MANAGEMENT ISSUES		**Fire:** The current fire regime in the Darwin region differs from that in other sparsely populated savanna areas of the NT and is ad hoc and closely linked to tenure (Price and Baker 2007). The frequency of late-dry-season fires is lower in the Darwin region than other areas (Price and Baker 2007), but exotic grasses are increasing fuel loads and the intensity of fires (Kean and Price 2003). In the period 1993-2004, 30% of the site was burnt in fewer than three years, and 18% was burnt in more than six years. **Feral animals:** Water Buffalo and feral pig have had a large impact on many rainforest and wetland habitats around Darwin in the past but there has been a substantial reduction in numbers in recent years, although ongoing control is required (Liddle *et al.* 2006). **Weeds:** Two Weeds of National Significance (*Lantana camara* and *Salvinia molesta*), 18 declared Category A and B weeds, and eight undeclared but problematic environmental weeds (high priority weeds: Smith 2001) are recorded from this site. Exotic pasture grasses, especially mission grasses *Pennisetum spp.* and gamba grass *Andropogon gayanus,* are spreading rapidly in the Darwin region and have the potential to seriously affect the fire regime and integrity of natural habitats (Kean and Price 2003). **Other:** Urbanisation and drainage of wetlands has occurred in this site and continued urban expansion associated with the growth of Darwin could lead to further development and land reclamation. Pollution and regular chemical spraying to control mosquito numbers have contributed to the degradation of the site (DIWA). Recreational use of the area is high and uncontrolled (DIWA). All coastal areas in northern Australia are at risk of degradation from sea-level rise resulting from climate change (Hyder Consulting 2007).
MANAGEMENT INFORMATION	**NRM groups**	Larrakia Rangers (Darwin).
	Protected areas	Buffalo Creek Management Area (2.2 km²/ 0.7% of site), Casuarina Coastal Reserve (0.9 km²/ 0.3% of site), Holmes Jungle Nature Park (2.5 km²/ 0.8% of site), Howard Springs Hunting Reserve (11 km²/ 3.5% of site), Howard Springs Nature Park (1.3 km²/ 0.4% of site), Knuckey Lagoons Conservation Reserve (0.8 km²/ 0.3% of site), Shoal Bay Coastal Reserve (104 km²/ 33% of site), Tree Point Conservation Area (4.5 km²/ 1.4% of site).
	Current management plans	**Site-specific plans:** Vegetation Retention Plans for the Darwin, Marrakai, and Katherine/Mataranka regions (Berghout *et al.* 2007); Darwin Harbour Regional Plan of Management (DHAC 2003); Casuarina Coastal Reserve Management Plan (PWCNT 2002); Howard Springs Nature Park Draft Plan of Management (PWSNT 2006); Holmes Jungle Nature Park Plan of Management (PWCNT 1997); Howard Springs Nature Park and Howard Springs Hunting Reserve Plan of Management (CCNT 1992); Knuckey Lagoons Conservation Reserve Management Plan (PWCNT 2000). **National recovery plans for threatened species:** *Ptychosperma macarthurii* (Liddle and Scott 2005); Northern Quoll (Hill and Ward in prep.); marine turtles (Environment Australia 2003); Gouldian Finch (O'Malley 2006); Red Goshawk (Baker-Gabb in prep.). **Other management plans:** Australian Weeds Strategy (NRMMC 2007); Threat Abatement Plan for Predation, habitat degradation, competition and disease transmission by feral pigs (DEH 2005); FIREPLAN: Fire management for the savanna community (Russell-Smith *et al.* in prep.).

	Monitoring programs and research projects	Migratory shorebirds are surveyed regularly between Lee Point and Buffalo Creek (A & S. Keates pers. comm.). Fauna and vegetation are monitored at permanent sites in NTG parks within the Darwin region including the Howard Springs Nature Park and Hunting Reserve, Casuarina Coastal Reserve and Holmes Jungle Nature Park (Calnan et al. 2008). Dolphins are surveyed monthly along transects within Darwin Harbour and Shoal Bay (C. Palmer, NRETAS unpubl.). There is an ongoing program of monitoring and removal of Saltwater Crocodiles from within Darwin Harbour and Shoal Bay (Nichols and Letnic in press). Fire in the tropical savannas is mapped continuously under the North Australia Fire Information Project http://www.firenorth.org.au/nafi/app/init.jsp
	Management recommendations	Establish a program to monitor migratory shorebirds and include community involvement (NRETA 2005). Develop a fire management strategy for the Darwin region that identifies clear objectives, roles and responsibilities (Price and Baker 2007). Prevent the spread of exotic grasses, especially mission grasses and gamba grass, into new areas in the Darwin region and reduce populations in areas with high conservation value or where fires threaten properties (Kean and Price 2003).
KEY REFERENCES	**Papers and reports**	Chatto, R. (2003). *The distribution and status of shorebirds around the coast and coastal wetlands of the Northern Territory.* Technical Report 73, Parks and Wildlife Commission of the Northern Territory, Palmerston. 257pp. DIWA (A Directory of Important Wetlands in Australia). *Australian Wetlands Database*. Department of Environment, Water, Heritage & the Arts, Canberra ACT (accessed November 2007). Price, O., Baker, B. (2007). Fire regimes and their correlates in the Darwin region of northern Australia. *Pacific Conservation Biology* 13, 177-188.
	Contributors	

Flock of migratory shorebirds on tidal flats, Shoal Bay (Photo: Louise Harrison)