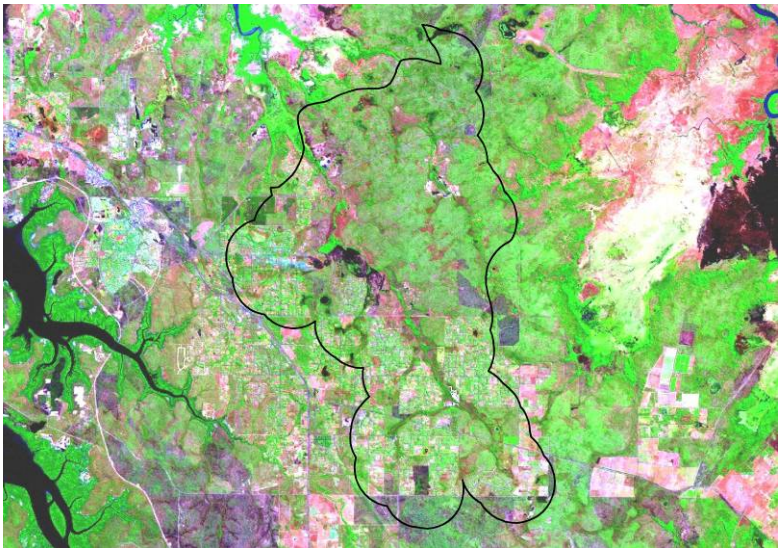
Howard sand plains

Location and Description

A major feature of the Darwin hinterland region is the extensive seasonally-inundated wetlands with shallow lagoons and swamps on sandy substrates. The Darwin region, especially around the Howard River area about 30 km east of Darwin, supports the largest and most continuous stretch of this significant sand plain habitat in the Northern Territory. The sand plains are usually associated with rivers and creeks, host a number of unique and threatened plant and animal species, and support distinctive vegetation types of grevillea heath and paperbark forest.



Tenure and Land Use

Almost 60% of this Site is privately-owned freehold land, and large portions in the north-east of the Site are pastoral leasehold land (Koolpinyah) and vacant Crown land. The main land use within the Site is horticulture and rural residential. Approximately 4% of the Site is managed as conservation reserves and other land uses within the Site include recreation and pastoral operations. Sand and gravel are extracted from generally shallow, but extensive, surface excavations within the Site.

Significance Rating

International Significance

Ecological Values

The Howard sand plains are a unique environment that supports a distinct vegetation type consisting of heathlands, open woodlands, sedgelands and grasslands with a variable overstorey of species such as *Melaleuca nervosa*, *Grevillea pteridifolia*, *Banksia dentata* and *Verticordia cunninghamii*. Many plant and animal species have adapted to, and are largely or entirely restricted to this habitat type, including the Howard River Toadlet *Uperoleia daviesae*. The sandy heaths also support populations of rare and endangered species, particularly the small carnivorous bladderwort plants of the genus *Utricularia*, for which the area forms an important part of an acknowledged world centre of diversity. Even within this context, the flora is outstanding for the unusual diversity and concentration of sand sheet species within a restricted area. Sand plains are also typically associated with monsoon rainforests, wetlands, and riparian vegetation, which are all restricted vegetation types in the Northern Territory, and hotspots for biodiversity.

Management Issues

Land clearing for mineral extraction and rural and agricultural expansion is currently the most significant management issues affecting the conservation values of the Howard sand plains. Vegetation fragmentation and hydrological change in the catchment are also likely to be affecting susceptible swamp and rainforest habitats. Recreational misuse of these sensitive environments is increasingly apparent as the population of Darwin continues to grow. This includes fire-bug activity in the region, leading to increased frequencies of fires in some areas. Exotic grasses are becoming more widespread and fuelling hotter and more destructive fires.

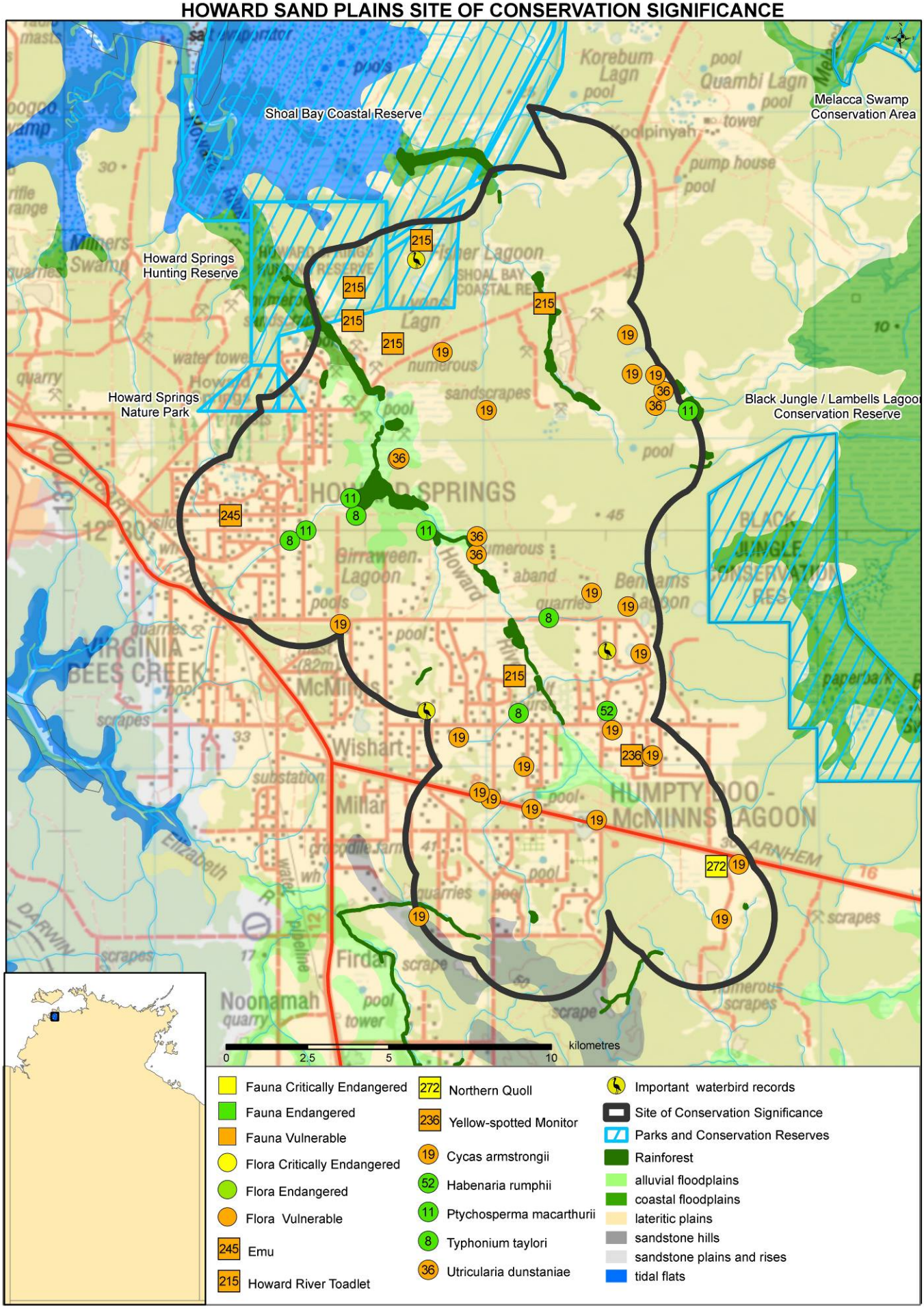
Condition

Large portions of the Site have been cleared, mined for sand and gravel, disturbed by roads and or planted with exotic trees or crops. Disturbance by recreational users, weed invasion and frequent fires are occurring in many areas.

Current Conservation Initiatives

Sand plain habitats in the Darwin region have been highlighted as having high conservation priority in a number of land-use plans, most recently in a draft vegetation retention plan for the Darwin region. A factsheet on sand plain habitats has been developed to highlight the values of the habitat and identify management priorities.

HOWARD SAND PLAINS SITE OF CONSERVATION SIGNIFICANCE



LOCATION	**SOCS Number**	7 (NT Parks and Conservation Masterplan Map Number 120)
	Latitude/Longitude	12º 31´ South, 131º 7´ East (at centre)
	Bioregion	Darwin Coastal
	Description	This site encompasses the largest and most continuous stretches of sand plain habitat in the NT and includes the area bounded by the Stuart and Arnhem Highways, Gunn Point Road and the western margin of the Adelaide River floodplain. The site comprises an area of 264 km² and is dominated by lateritic plains (246 km²). The Adelaide River coastal floodplain and Shoal Bay abut the Howard Sand Sheets, and nearby to the west is Darwin Harbour. All three 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)	Nine threatened species are reported from this site. **Plants** ▪ *Cycas armstrongii* (-/VU) ▪ *Habenaria rumphii* (-/EN) ▪ *Ptychosperma macarthurii* (EN/EN) ▪ *Typhonium taylori* (EN/EN) ▪ *Utricularia dunstaniae* (-/VU) A further ten plant species reported from the site are listed as Near Threatened at the NT level, and 13 rare species are too poorly known to be assessed against IUCN criteria and are listed as Data Deficient. **Vertebrates** ▪ Emu *Dromaius novaehollandiae* (-/VU) ▪ Northern Quoll *Dasyurus hallucatus* (EN/CR) ▪ Yellow-spotted Monitor *Varanus panoptes* (-/VU) ▪ Howard River Toadlet *Uperoleia daviesae* (-/VU) The Howard River Toadlet (*Uperoleia daviesae),* discovered in 2000, is only known from the Howard and Elizabeth River catchments (Ward 2006) and appears to be confined to the seasonally flooded sandy plains within this site. Although not formally listed as threatened, seasonally-moist sandsheets supporting a heathland or wet herbfield are highly restricted and are identified as an ecosystem at risk within the Darwin coastal bioregion (Woinarski 2002a).
ENDEMIC SPECIES	**Significance Rating**	**Regional Significance**
	Notes	**Endemic to the site:** The Howard River Toadlet (*Uperoleia daviesae)* and one plant species (*Typhonium taylori*) are currently only known from this site. **Endemic to the bioregion:** Two plant species (*Utricularia holtzei* and *Typhonium taylori*) and one vertebrate species (*Uperoleia daviesae)* recorded from this site are only found in the Darwin Coastal bioregion. **Endemic to the NT:** 58 plant and four vertebrate species recorded from this site are endemic to the NT. **Other:** Six plant species are restricted to the site or the Darwin Coastal bioregion within the NT, but are also found in other states.
WILDLIFE AGGREGATIONS	**Significance Rating**	**Regional Significance**
	Marine turtles	Not applicable
	Seabirds	No major aggregations recorded
	Waterbirds	This site lacks a large area of open freshwater wetland and supports relatively low numbers of waterbirds. Chatto (2006; R. Chatto, NRETAS, unpubl.) notes four important waterbird records for this site, including counts of Green Pygmy-goose and Comb-crested Jacana that are regionally important.
	Shorebirds	No major aggregations recorded
	Notes	There are no other reported or known other aggregations of wildlife within the site.
WETLANDS	**Significance Rating**	**Regional Significance**
	Ramsar criteria met	Not assessed
	DIWA criteria met	Not assessed
	Notes	This site has been nominated as a national High Conservation Value Aquatic Ecosystem (the finalised list of HCVAE will replace the DIWA list), and is a priority HCVAE in the Caring for our Country Business Plan 2009-2010 (Commonwealth of Australia 2008). Small and isolated freshwater lagoons are a characteristic of the area to the east and south-east of Darwin, including the Howard River area, and they are identified and mapped in a report by Schult (2005).
	Rivers	The Howard River is one of the smaller NT rivers and drains the eastern Darwin hinterland. It is fed by springs and by heavy wet season rainfall in the catchment.

FLORA	**Significance Rating**	**National Significance**
	Notes	**Rainforest:** About 290 ha of monsoon vine thicket occurs within this site. The majority of it is spring-fed and occurs as small patches (<10 ha) along the Howard River and other small tributaries; one patch is >100 ha (Russell-Smith 1991). Larger areas of rainforest occur immediately to the east of the Howard River region on the margin of the Adelaide River floodplain. **Restricted range species:** The Top End is among the richest regions in the world for small carnivorous bladderwort plants (genus *Utricularia*). At least 26 bladderwort species occur in the Darwin hinterland, and these are especially concentrated in the Howard and Adelaide River floodplains (Cowie 2002), including the Howard sand plains.
OTHER ENVIRONMENTAL VALUES		Four sites on the Howard sandsheets are listed on the Register of the National Estate for their natural values including Girraween Lagoon, Howard River Site, Howard Springs Nature Park and Koolpinyah Spring Jungle (Australian Heritage Council). 36 species recorded from this site are listed under international conventions or bilateral agreements protecting migratory species.
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). Fire suppression predominates on freehold land but active burning occurs on Aboriginal lands and publicly-owned lands (often for hazard reduction/asset protection, but also due to fire-bugs). More than a third of the heathlands in the region are burnt annually, often in the late-season fires, and almost a third of grassy swamp areas are burnt each year (Price and Baker 2007). Exotic grasses are increasing fuel loads and the intensity of fires in the Darwin region (Kean and Price 2003). In the period 1993-2004, 45% of the site was burnt in fewer than three years, and 13% was burnt in more than six years. **Feral animals:** Water buffalo and feral pigs 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). Feral cat, domestic dog, rats and mice occur in the area. The full impact of Cane Toads on local ecosystems is not known. **Weeds:** One Weed of National Significance (*Salvinia molesta*), five declared Category A and B weeds (*Barleria prionitis, Hyptis suaveolens, Pennisetum polystachion* subsp. *Polystachion, Senna obtusifolia, Sida cordifolia*), and three undeclared but problematic environmental weeds (high priority weeds; Smith 2001) (*Andropogon gayanus, Azadirachta indica, Calopogonium mucunoides*) are recorded from this site. Exotic pasture grasses, especially mission grasses *Pennisetum* sp. 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:** About 20% of sand plain habitat in the broader Darwin region has been cleared of vegetation to date (NRETA 2007). Vegetation clearing for sand-mining affects about 40 ha of sand plain habitat in the Darwin region per year and this is likely to increase in the future as Darwin continues to grow (Price *et al.* 2005). Recovery of woody vegetation on disturbed sites is also poor (Price *et al.* 2005). Sand plain habitats are also being affected by urban and agricultural expansion associated with the growth of Darwin, and they are not currently protected under the NT Land Clearing Guidelines (NRETA 2006). Land-use change in the Darwin rural area could also be affecting the quality and quantity of water available to sensitive sand plain and rainforest environments (Liddle *et al.* 2006). Uncontrolled recreational use is occurring in sand plain habitats in the broader Darwin region (Ward 2006). The lack of survey effort in sand plain habitat in the broader Darwin region is limiting knowledge on the distribution and abundance of many sand plain taxa (Cowie 2002).
MANAGEMENT INFORMATION	**NRM groups**	Girraween Landcare Group.
	Protected areas	Howard Springs Hunting Reserve (5 km²/ 2% of site), Howard Springs Nature Park (0.7 km²/ 0.3% of site), Shoal Bay Coastal Reserve (5 km²/ 2% of site).
	Current management plans	**Site-specific plans:** Howard Springs Nature Park Draft Plan of Management November 2006 (PWSNT 2006); Howard Springs Nature Park and Howard Springs Hunting Reserve Plan of Management (CCNT 1992); Darwin Harbour Regional Plan of Management (DHAC 2003); Draft Vegetation Retention Plans for the Darwin, Marrakai, and Katherine/ Mataranka regions (Berghout *et al.* 2007). **Recovery plans for threatened species:** *Ptychosperma macarthurii* (Liddle and Scott 2005); Northern Quoll (Hill and Ward in prep.). **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); FIREPLAN: Fire management for the savanna community (Russell-Smith *et al.* in prep.).

	Monitoring programs and research projects	Permanent plots have been established in rainforest patches in the Darwin hinterland, including the Howard River area, to monitor the extent and condition of rainforest and water supply dynamics (D. Liddle, NRETAS unpubl.). A program established to monitor *Ptychosperma macarthurii* populations near Darwin (Liddle *et al.* 2006) includes one rainforest patch (Whitewood Road) in this site. Fauna and vegetation are monitored at permanent sites in NTG parks within the Darwin region, including the Howard Springs Nature Park and Hunting Reserve (Calnan *et al.* 2008). The health of lagoons in the Darwin Region is currently being monitored using a range of trial indicators (Lamche 2008). 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	Develop a native vegetation retention plan in consultation with landholders and other stakeholders (NRETA 2005). Identify priority areas for the conservation of sandsheets, associated heathland vegetation, and threatened plant species, and develop appropriate management programs with landholders and other stakeholders (NRETA 2005). Investigate establishing conservation agreements with landholders or developing other forms of reservation (NRETA 2005). Retain bushland corridors and fragments within the horticultural and rural lands around and to the east of Darwin (Woinarski 2002a). Enhance the formal reserve system around Darwin to provide better representation of the narrowly endemic and threatened seasonally damp sandsheet environments (Woinarski 2002a). Develop management plans for several of the highly localised threatened plant species within the Darwin rural area (Woinarski 2002a). Improve rehabilitation requirements of mine sites (Price *et al.* 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 such as the Howard sandsheets, or where fires threaten properties (Kean and Price 2003).
KEY REFERENCES	**Papers and reports**	Cowie, I. (2002). *Preliminary report on a survey of Utricularia (Lentibulariaceae) in the Howard River-Shoal Bay area.* Unpublished report. Parks and Wildlife Commission of the Northern Territory, Palmerston. Ward, S. 2006. *Howard River Toadlet Uperoleia daviesae: Threatened Species of the Northern Territory.* Department of Natural Resources, Environment & the Arts, Darwin. NRETA (2007). *Factsheet: Conservation Values of Sand Plain Habitats*. Northern Territory Department of Natural Resources, Environment and the Arts, Darwin.
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The Howard River Toadlet *Uperoleia daviesae* is known only from the Howard and Elizabeth River catchments (Photo: Ian Morris)