

Daly River middle reaches

Location and Description

This Site is centred on the Daly River, which is one of the largest river systems in northern Australia. The middle reaches of the river, located about 150 km south of Darwin, are characterised by high banks and permanent flows of clear water. The river is fed by extensive up-stream aquifer systems and, downstream, feeds into the extensive floodplains of the lower Daly system and Anson Bay. Wet season flows in the river are high and the continuous dry-season flows of spring-fed water result in a unique freshwater ecosystem that supports numerous threatened or otherwise important species, but also makes the area a target for future agricultural development. The vegetation along the river is predominantly eucalypt woodland with an understorey of tropical grasses, and pockets of monsoon forest.



Tenure and Land Use

The middle reaches of the Daly River are predominantly Crown leasehold and pastoral leasehold land and include two pastoral properties (Tipperary and Fish River). Smaller portions of the Site at the eastern and western ends of this stretch of the river are a mix of tenure types including freehold and Crown leasehold land. The main land use within the Site is pastoral operations, and other uses include Indigenous, recreation and tourism. Almost 5% of the Site is managed as conservation reserves. The small communities of Daly River (population 470) and Nauiyu occur in the western part of the Site.

Significance Rating

National Significance

Ecological Values

The ecological values of this Site are mostly related to the distinctive features of the Daly River (large and perennial flow) that result in a unique freshwater ecosystem. The river supports a high diversity (eight species) of freshwater turtles which is the richest in Australia and includes most of the Australian population of the Pig-nosed Turtle. Several species of threatened or rare freshwater fish also occur in the river, including Freshwater Sawfish and Freshwater Whipray. The Site supports an extensive and well-developed riparian rainforest network.

Management Issues

Sections of the riparian zone have heavy infestations of weeds and feral animals (principally pig) and some show stream bank erosion, partially due to grazing and movement of livestock. Frequent hot fires are of increasing concern. Agricultural development in the region, with

associated vegetation clearing and water extraction, has the potential to affect conservation values of the Daly River system.

Condition

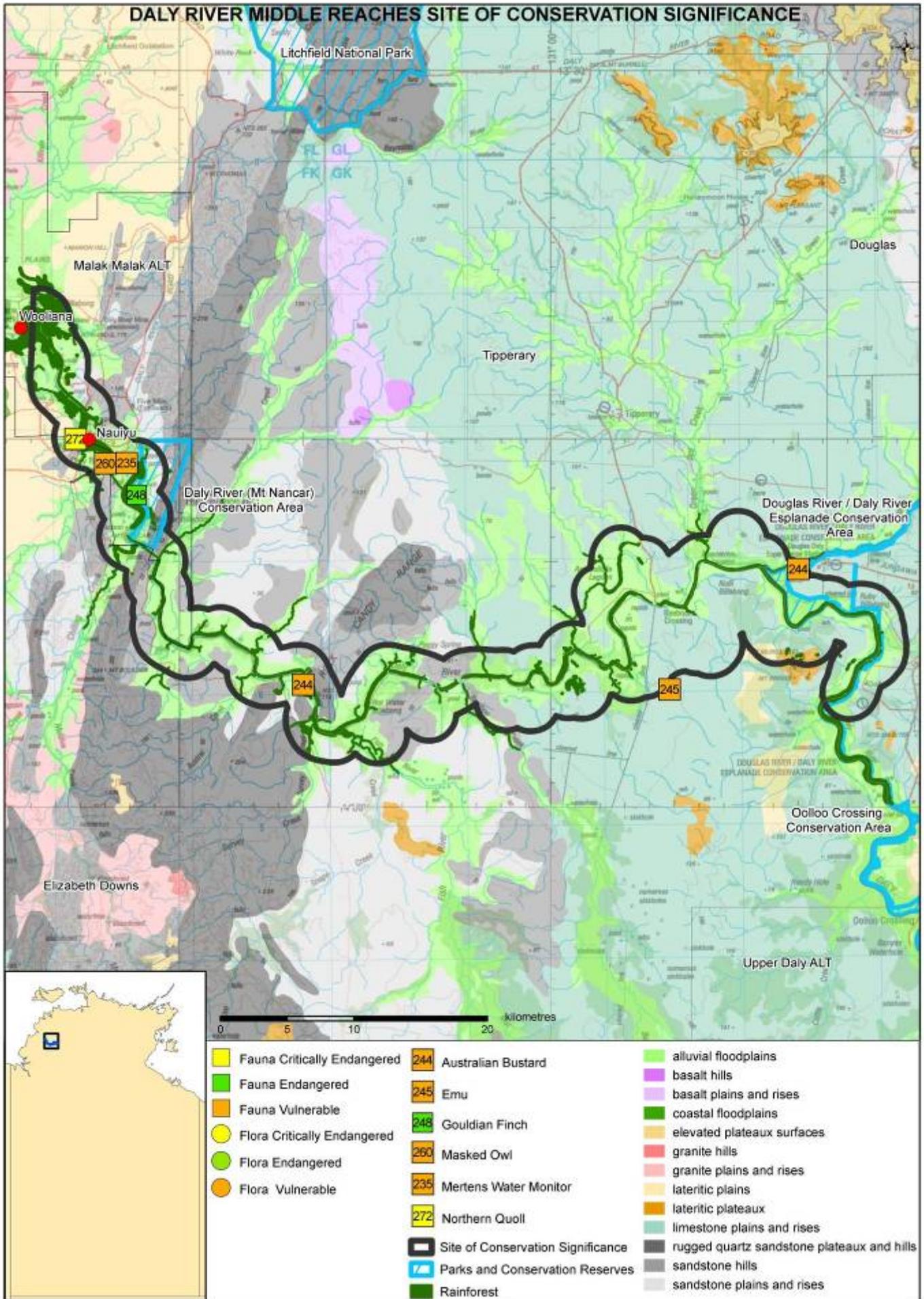
The riparian zone is mostly in reasonably good condition, though there have been some impacts from weeds, feral animals and fire.

Current Conservation Initiatives

The Daly River Management Advisory Committee has been established to develop options for the sustainable use and conservation of natural resources within the Daly River region, in response to increasing pressures for development. A catchment-wide conservation plan for the Daly is currently being prepared and a plan for the use and conservation of the important Ooloo aquifer is also in preparation. A moratorium on vegetation clearance (Interim Development Control 17) applies to the whole of this site.

The Tipperary Group of Stations has two conservation staff and an active environmental works program, including control of weeds, fire, feral animals and erosion.

A number of research and monitoring projects are currently being conducted in the Daly region and Wangamaty Landcare Group is working with other stakeholders to stabilise fragile parts of the riverbank through revegetation activities, feral ant eradication, weed and feral animal management.



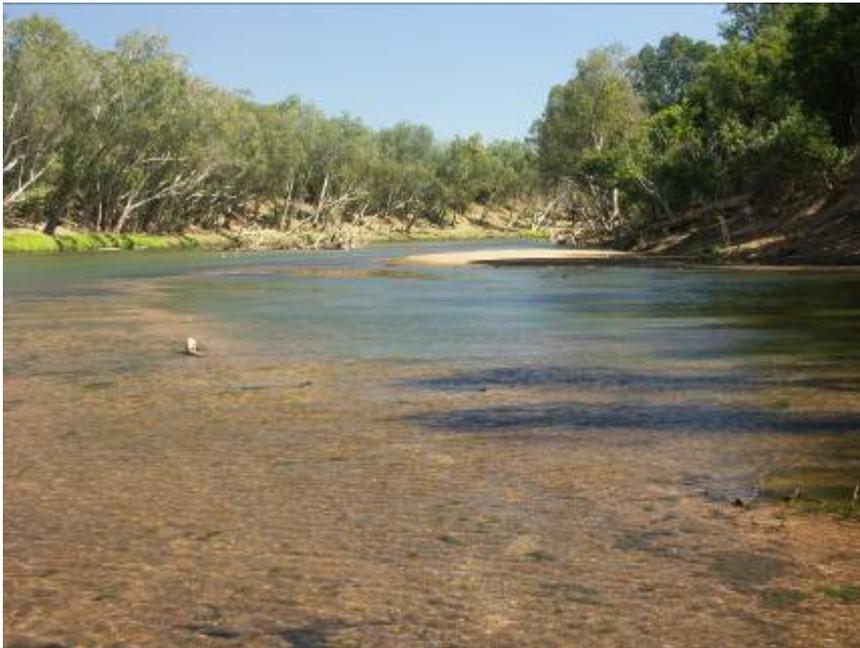
DALY RIVER MIDDLE REACHES - SITE OF CONSERVATION SIGNIFICANCE

LOCATION	SOCS Number	3 (NT Parks and Conservation Masterplan Map Number 18)
	Latitude/Longitude	13° 55' South, 130° 57' East (at centre)
	Bioregion	Daly Basin (85%), Victoria Bonaparte (15%)
	Description	This site includes the middle reaches of the Daly River from Ruby Billabong to Horseshoe Billabong and the riparian strip and billabongs within 2 km of the main river channel. It encompasses an area of 547 km ² and is dominated by alluvial floodplain (303 km ²). This site is immediately upstream from the Anson Bay and associated coastal floodplains site of high conservation significance in the NT.
THREATENED SPECIES	Significance Rating	National 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)	Six threatened species are reported from this site. Vertebrates <ul style="list-style-type: none"> ▪ Australian Bustard <i>Ardeotis australis</i> (-/VU) ▪ Gouldian Finch <i>Erythrura gouldiae</i> (EN/EN) ▪ Masked Owl <i>Tyto novaehollandiae</i> (VU/VU) ▪ Northern Quoll <i>Dasyurus hallucatus</i> (EN/CR) ▪ Merten's Water Monitor <i>Varanus mertensi</i> (-/VU) ▪ Freshwater Sawfish <i>Pristis microdon</i> (VU/VU) (Pogonoski <i>et al.</i> 2002) The middle reaches of the Daly River are also an important area for Pig-nosed Turtle <i>Carettochelys insculpta</i> (-/NT) and Freshwater Whipray <i>Himantura chaophraya</i> (-/DD). Cane toads have caused severe declines in populations of monitors in the Daly Region (Doody <i>et al.</i> in press).
ENDEMIC SPECIES	Significance Rating	Not Significant
	Notes	Endemic to the bioregion: One plant species recorded in the site is an NT endemic only found in the Daly Basin bioregion (<i>Cycas canalis</i> subsp. <i>carinata</i>). Endemic to the NT: 25 plant and two vertebrate species recorded in this site are only known from the NT.
WILDLIFE AGGREGATIONS	Significance Rating	Not Significant
	Marine turtles	Not applicable
	Seabirds	No major aggregations known
	Waterbirds	No major aggregations known
	Shorebirds	No major aggregations known
	Other aggregations	The middle reaches of the Daly River provide a permanent flowing river system used by a variety of water-dependent animals. However, there are no known large aggregations or nesting colonies of wildlife in the site.
WETLANDS	Significance Rating	National Significance
	Ramsar criteria met	Not assessed
	DIWA criteria met	The middle reaches of the Daly River and associated wetlands are listed as a wetland of national significance in the Directory of Important Wetlands in Australia (DIWA: NT001 Daly Middle Reaches). The wetlands meet criteria 1, 2, 3, 4 and include DIWA wetland types B1 and B6.
	Notes	This site has been nominated as a national High Conservation Value Aquatic Ecosystem (the finalised list of HCVAE will replace the DIWA list). The Daly Middle Reaches are a good example of permanent freshwater river occurring in low relief country of the Top End (DIWA). Billabongs associated with the river are mostly seasonal.
	Rivers	The Daly River is one of the largest (possibly largest) spring-fed perennial rivers in Australia's wet-dry tropics. This results in perennial flow in the Daly River system. Large limestone aquifers, upstream of the middle reaches, capture monsoonal rains during the wet season which are then discharged into the river providing high flows through the dry season (Begg <i>et al.</i> 2001). The river flows year-round with surface inflow from numerous major creeks and rivers and some input from springs. Of the few perennial rivers in the NT, the Daly River has the highest end-of-dry-season flow (approximately 12 cubic metres/second at Mt Nancar) (Begg <i>et al.</i> 2001), five times that of any other NT river. The Daly River has the second highest annual average discharge of rivers in the NT (6730 GL/year) after the East Alligator River (6900 GL/year), and the fourth largest discharge of tropical rivers occurring between Cairns and Broome (NLWRA 2000 in NGIS Australia 2004, Table 6, p17). Water from the limestone aquifers feeding the Daly is dominated by calcium and magnesium salts (most Australian river water is dominated by sodium and chloride ions) (Blanch <i>et al.</i> 2005). The water is also generally clear and has very low levels of nutrients during the dry season (Blanch <i>et al.</i> 2005).

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FLORA	Significance Rating	Regional Significance
OTHER ENVIRONMENTAL VALUES		<p>Rainforest: This site includes about 2150 ha of monsoon rainforest (or 1% of the NT rainforest estate) (Russell-Smith 1991). Most rainforest in the site is riparian or spring-fed and occurs as small patches <10 ha; but many patches are 10-100 ha and four patches are >100 ha.</p> <p>The Daly River supports a greater diversity of freshwater turtles than any river system in Australia, with eight of the 12 freshwater turtle species found in the NT (A. Georges pers. comm. in Price <i>et al.</i> 2002). The population of the taxonomically and geographically relict Pig-nosed Turtle in the Daly River is the largest and most secure known (Georges & Rose 1993 in Price <i>et al.</i> 2002).</p> <p>The Daly River supports high densities of Saltwater Crocodiles (Fukuda <i>et al.</i> 2007).</p> <p>A relatively high number (48) of freshwater or estuarine fish species are found in the river including several threatened or rare species such as Freshwater Sawfish <i>Pristis microdon</i>, Freshwater Whipray <i>Himantura chaophraya</i> and Strawman <i>Quirichthys stramineus</i> (H. Larson, NRETAS, pers. comm.). Freshwater Sawfish and Freshwater Whipray are frequently seen at Beeboom Crossing on the Daly River throughout the dry season (B. Rankmore, pers comm.).</p> <p>Three sites on the Daly Middle Reaches are listed on the Register of the National Estate for their natural values including: Daly River Crossing Area, Douglas River Vine Forest, and Daly and Katherine Rivers (part) (Australian Heritage Council).</p> <p>14 species recorded from this site are listed under international conventions or bilateral agreements protecting migratory animals.</p>
MANAGEMENT ISSUES		<p>Fire: In the period 1993-2004, 34% of the site was burnt in fewer than three years, and 7% was burnt in more than six years. Fire is a particular problem on the edges of the floodplains (B. Rankmore, pers comm.).</p> <p>Feral animals: Pigs are degrading some riparian and rainforest areas of the site. Feral horses and water buffalo are also problems in the area. There is a small infestation of African Big-headed Ants in Browns Creek area on the Daly River (CSIRO undated). Cane Toads have caused severe declines in populations of monitors in the Daly Region (Doody <i>et al.</i> in press)</p> <p>Weeds: Two Weeds of National Significance (<i>Mimosa pigra</i> and <i>Parkinsonia aculeate</i>), 12 declared Category B weeds, and two other undeclared but problematic environmental weeds (high priority weeds: Smith 2001) are recorded from this site. Bellyache bush (<i>Jatropha gossypifolia</i>) infests some creek systems just outside of the Site and need control before they reach the Daly River.</p> <p>Other: The Daly River region has been identified as an area of potential for agricultural development and intensification. Activities associated with possible development – including land clearing, water extraction, chemical and soil runoff, spread of weeds – have the potential to affect conservation values of the Daly River region (Price <i>et al.</i> 2003). Parts of the site are currently heavily grazed by livestock and, in places, livestock are causing severe bank erosion.</p>
MANAGEMENT INFORMATION	NRM groups	Malak Malak Land Management Rangers (Maddaingya Outstation), Wangamaty Landcare group (Daly River) (Northern Land Council 2006).
	Protected areas	Daly River (Mt Nancar) Conservation Area (15 km ² / 3% of site), Douglas River/ Daly River Esplanade Conservation Area (10 km ² / 2% of site).
	Current management plans	<p>Site-specific plans: A Conservation Plan for the Daly Basin Bioregion (Draft for public consultation; Price <i>et al.</i> 2002) is currently being updated. In 2004, the Daly Region Community Reference Group developed a planning and adaptive management process for development and conservation across the broader Daly catchment (http://www.nt.gov.au/nreta/water/drmac/pdf/draftreport.pdf).</p> <p>National recovery plans for threatened species: Northern Quoll (Hill and Ward in prep.); Gouldian Finch (O'Malley 2006); Masked Owl (Woinarski 2004a).</p> <p>Other management plans: Australian Weeds Strategy (NRMMC 2007); 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>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>Regular surveys of Saltwater Crocodiles are conducted in the Daly River (PWSNT 2005), with the next surveys scheduled for 2009.</p> <p>The Daly River has been a focus for research on freshwater turtles, especially the Pig-nosed Turtle (Doody <i>et al.</i> 2000).</p> <p>A Land and Water Australia research project is currently relating the effects of land clearing on biodiversity (T. Griffiths, NRETAS, unpubl.).</p> <p>Irregular sampling of macro-invertebrates has occurred in the Daly River in recent years (Dostine 2000).</p> <p>A number of research projects are currently being conducted in the Daly (Tropical Rivers and Coastal Knowledge Consortium http://www.track.gov.au/).</p>
Management recommendations	<p>In conjunction with landholders, in the context of Daly Basin land-use planning processes and in accordance with the Draft Daly Basin Conservation Plan, develop management and monitoring programs for wetlands and develop a concept plan for a new park in the Fish River area including options for joint management (NRETA 2005). These may be updated with the completion of a new Conservation Plan for the wider Daly catchment currently in preparation.</p> <p>Provide financial resources and extension services for landholders to support established monitoring and management programs (NRETA 2005).</p>	

KEY REFERENCES	Papers and reports	<p>Blanch, S., Rea, N. and Scott, G. (2005). <i>Aquatic conservation values of the Daly River Catchment, Northern Territory, Australia</i>. A report prepared by WWF-Australia, Charles Darwin University and the Environment Centre NT, Darwin, 28pp.</p> <p>Doody JS, Georges A, Young J. (2000) <i>'Monitoring Plan for the Pig-nosed Turtle in the Daly River, Northern Territory'</i> Applied Ecology Research Group, University of Canberra, for the Parks and Wildlife Commission of the Northern Territory, Canberra, ACT.</p> <p>Price, O., Milne, D., Connors, G., Harwood, B., Woinarski, J.C.Z. & Butler, M. (2003). <i>A Conservation Plan for the Daly Basin Bioregion. Draft for public consultation</i>. Parks and Wildlife Commission of the Northern Territory, Darwin.</p>
	Contributors	<p>Tony Griffiths, Biodiversity Conservation, NRETAS, Darwin</p> <p>Bryan Baker, Senior Policy Unit, NRETAS, Darwin</p>



Clear waters and high vegetated banks typical of the middle reaches of the Daly River (Photo: Julia Schult)



The threatened Merten's Water Monitor *Varanus mertensi*, which is found at the site (Photo: Simon Ward)