

## Karinga Creek paleodrainage system

### Location and Description

The Karinga Creek paleodrainage system consists of a chain of more than 100 saline lakes between Horseshoe Bend and Curtin Springs pastoral stations, about 200 km south of Alice Springs. The paleodrainage system is part of a larger chain of saline lakes that extend 500 km from Lake Hopkins in Western Australia to the Finke River in the Northern Territory. Karinga Creek flows after substantial rainfall and the extensive lakes, claypans and salt pans are temporarily filled. The lake basins are sparsely vegetated but do support areas of samphire.

### Tenure and Land Use

This Site is entirely on pastoral leasehold land within seven pastoral leases (Erlunda, Lyndavale, Idracowra, Curtin Springs, Horseshoe Bend, Angus Downs and Palmer Valley). The main land use within the Site is pastoral operations. The Stuart and Lasseter Highways pass through the Site and Imanpa community (population 149) is 14 km north of the Site.

### Significance Rating

International Significance

### Ecological Values

After flooding, the Karinga Creek system provides important habitat for waterbirds and migratory shorebirds. Limited surveys of the Site reported more than 10 000 waterbirds and shorebirds and internationally significant numbers of Banded Stilt, Red-capped Plover and Sharp-tailed Sandpiper. Five threatened vertebrate species and one threatened plant species are reported from the Site.

### Management Issues

Wildfires and feral animals such as camel, horse and rabbit are likely to be degrading vegetation communities and sensitive habitats within the Site. Athel pine, buffel grass and couch grass are present and spreading in the Site.

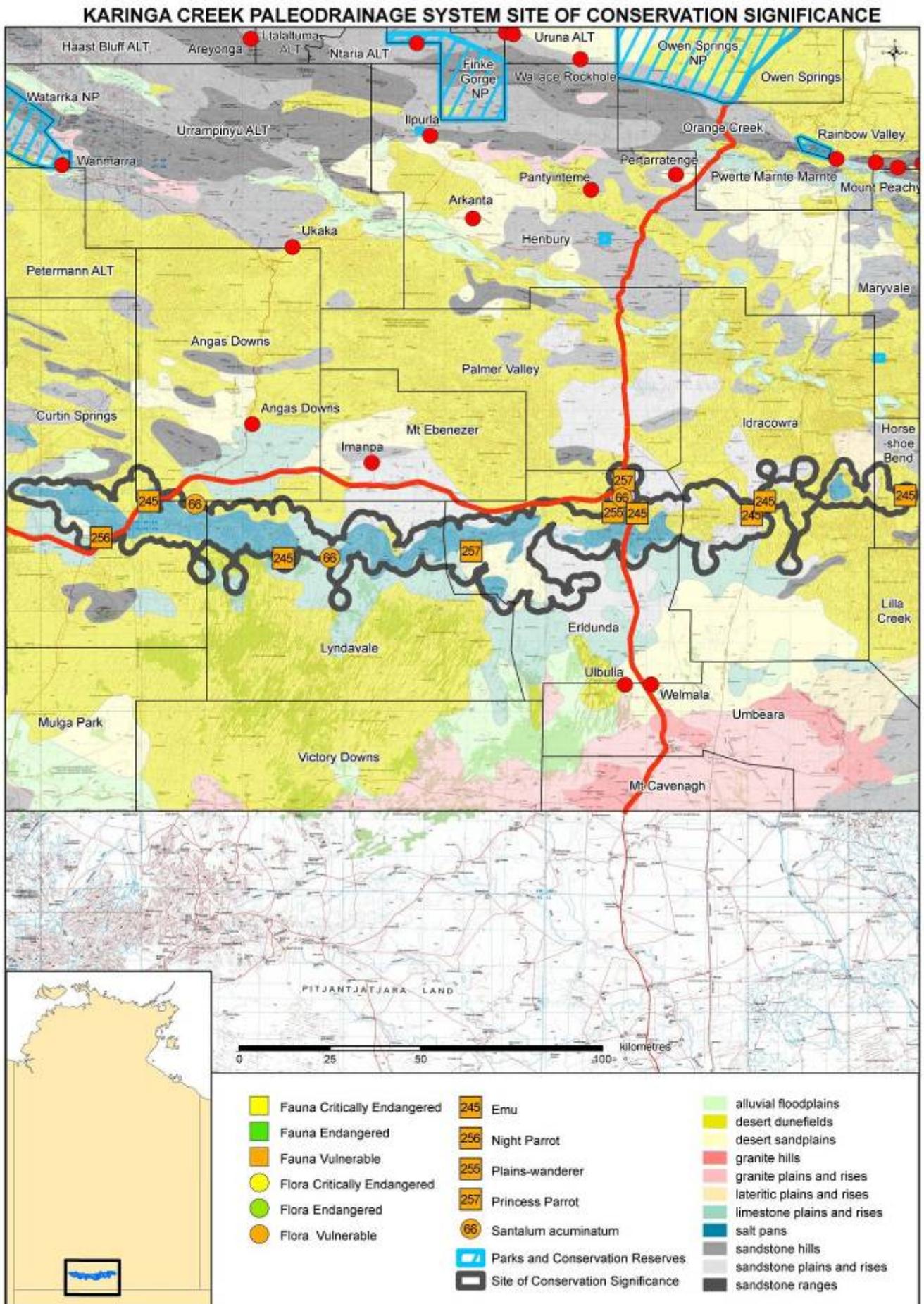
### Condition

No information located.

### Current Conservation Initiatives

A 130 km stretch of the Karinga Creek system was treated for athel pine infestation in 2004 as part of a longer term control program in the Finke River area.





LOCATION	<b>SOCS Number</b>	63 (NT Parks and Conservation Masterplan Map Number 103)
	<b>Latitude/Longitude</b>	25° 18' South, 132° 48' East (at centre)
	<b>Bioregion</b>	Finke (100%)
	<b>Description</b>	<p>The boundary of this site has been delineated based on significant wetland areas identified by Duguid <i>et al.</i> (2005) and the Karinga Creek Site of Botanical Significance boundary as described by White <i>et al.</i> (2000), with an additional 2 km buffer. The site has an area of 3292 km<sup>2</sup>.</p> <p>The lake beds are sparsely vegetated but may support samphire and <i>Ruppia</i> sp. (DIWA). Dominant vegetation communities surrounding the lakes include southern bluebush <i>Maireana astrotricha</i> shrubland with ephemeral herb/grassland, and spinifex grassland with blue mallee <i>Eucalyptus gamophylla</i> and acacia tall open-shrubland overstorey or desert oak <i>Allocasuarina decaisneana</i> open-woodland overstorey. River red gums <i>Eucalyptus camaldulensis</i> line some of the major drainage lines within the site (White <i>et al.</i> 2000).</p>
THREATENED SPECIES	<b>Significance Rating</b>	<b>National Significance</b>
	<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>Six threatened species are reported from this site.</p> <p><b>Plants</b></p> <ul style="list-style-type: none"> <li>▪ Quandong <i>Santalum acuminatum</i> (-/VU)</li> </ul> <p><b>Vertebrates</b></p> <ul style="list-style-type: none"> <li>▪ Emu <i>Dromaius novaehollandiae</i> (-/VU)</li> <li>▪ Malleefowl <i>Leipoa ocellata</i> (VU/CR)</li> <li>▪ Night Parrot <i>Pezoporus occidentalis</i> (EN/CE)</li> <li>▪ Plains Wanderer <i>Pedionomus torquatus</i> (VU/DD)</li> <li>▪ Princess Parrot <i>Polytelis alexandrae</i> (VU/VU)</li> <li>▪ Bilby <i>Macrotis lagotis</i> (VU/VU)</li> </ul> <p>There are no confirmed records of the Plains Wanderer in the NT but there were plausible records from Erdunda Station in 1983 (Woinarski <i>et al.</i> 2007).</p>
ENDEMIC SPECIES	<b>Significance Rating</b>	<b>Not Significant</b>
	<b>Notes</b>	<p><b>Endemic to the NT:</b> An undescribed form of <i>Acacia</i>, related to <i>A. oswaldii</i>, occurs in the site and is potentially a new NT endemic species.</p> <p><b>Other:</b> One bird species (White-fronted Chat <i>Epthianura albifrons</i>) and two plant species (<i>Eremophila neglecta</i> and <i>Malacocera tricornis</i>) recorded from this site are restricted to the Finke Bioregion within the NT but also occur in other states.</p>
WILDLIFE AGGREGATIONS	<b>Significance Rating</b>	<b>International Significance</b>
	<b>Marine turtles</b>	Not applicable
	<b>Seabirds</b>	None known
	<b>Waterbirds</b>	<p>18 species of waterbirds and shorebirds are recorded from the site.</p> <p>When inundated the lakes form important habitat for waterbird aggregations but little data is available.</p>
	<b>Shorebirds</b>	<p>After flooding, the lakes form an important stop-over for at least six species of shorebirds: Sharp-tailed Sandpiper, Curlew Sandpiper, Common Greenshank, Red-necked Stint, Marsh Sandpiper and Common Sandpiper.</p> <p><b>Total numbers of shorebirds:</b> A total of 10 799 wetland birds (dominated by shorebirds) were reported from a survey of the lakes in September 1989 which followed an exceptional (one in 50 year) rainfall event which inundated most lakes in the Karinga Creek system (M. Fleming in Duguid <i>et al.</i> 2005).</p> <p><b>Counts of individual species:</b> Internationally significant counts (&gt; 1% global population; G. Dutton in prep.) of three shorebird species are reported from a survey of this site in 1989 including: 2351 Banded Stilts; 2341 Red-capped Plovers; and 1955 Sharp-tailed Sandpipers (M. Fleming in Duguid <i>et al.</i> 2005).</p>
	<b>Other aggregations</b>	None known
WETLANDS	<b>Significance Rating</b>	<b>National Significance</b>
	<b>Ramsar criteria met</b>	The Karinga Creek system has not been assessed against Ramsar criteria.
	<b>DIWA criteria met</b>	<p>A part of the Karinga Creek paleodrainage system (a 32 km stretch of the creek near the centre of the site) is listed on the Directory of Important Wetlands in Australia (DIWA) with details as follows:</p> <p>ID: NT004 The Karinga Creek Paleodrainage System</p> <p>Criteria met: 1, 4, 6. Wetland type: B8</p>

	<b>Notes</b>	<p>This is part of a site that has been nominated as a national High Conservation Value Aquatic Ecosystem (the finalised list of HCVAE will replace the DIWA list).</p> <p>The Karinga Creek paleodrainage system comprises numerous named and unnamed lakes including Murphy's, Pulcura, Mygoora and Calatta Springs Lakes. The lakes range in size, groundwater hydrology and salinities, but are generally dry and support little or no vegetation.</p> <p>The lakes are inundated episodically following substantial rainfall but are often dry again only a few days after rainfall, due to evaporation and seepage. Runoff from rainfall and direct precipitation during substantial rainfall events provide the principal water supply to the lakes, but the longevity and salinity of the lakes is influenced by how they interact with the underlying groundwater system. Groundwater discharges at permanent springs and ephemeral seepage creeks at the lake margins.</p> <p>Most of the lakes were inundated in 1989 when an eastwards flow or seepage between lakes was observed. This probably indicates the pattern of palaeodrainage (prehistoric) that operated when the climate was less arid. At times the water is up to several centimetres deep, and can reach tens of centimetres in depth after substantial inundation. Water ranges from fresh to highly saline in the various lakes (DIWA).</p> <p>The Karinga Creek paleodrainage system is part of a larger chain of lakes that extend from Lake Hopkins in Western Australia to the Finke River, and includes Lakes Amadeus and Neale. This larger paleodrainage system is also known as the 'Central Australian Groundwater Discharge Zone' (Jacobson 1996).</p>
	<b>Rivers</b>	The Karinga Creek system is an ephemeral drainage channel that feeds into the Finke River (Duguid 2005).
FLORA	<b>Significance</b>	<b>Not Significant</b>
	<b>Notes</b>	<b>Restricted range species:</b> Four plant species reported from the site have restricted ranges within the NT ( <i>Sclerochlamys brachyptera</i> , <i>Maireana pentatropis</i> , <i>Menkea sphaerocarpa</i> , <i>Acacia nyssophylla</i> ).
OTHER ENVIRONMENTAL VALUES		<p>The Karinga Creek paleodrainage system is listed on the Register of National Estate for its natural values (Australian Heritage Council).</p> <p>Karinga Creek is identified as a Site of Botanical Significance in White <i>et al.</i> (2000).</p> <p>The Karinga Creek system is recognised as a refugium for biological diversity by Morton <i>et al.</i> (1995).</p> <p>The Karinga Creek paleodrainage system is identified as being significant for biodiversity conservation in Duguid <i>et al.</i> (2005).</p> <p>There are seven migratory species recorded for this site that are listed under international conventions or bilateral agreements protecting migratory animals.</p> <p>This site may encompass significant fossil records of extinct mega-fauna.</p> <p>Brine reservoirs in the lake beds may be up to 2.5 m thick, and the Brine shrimp <i>Paratemia</i> sp. has been recorded from the Karinga Creek system (DIWA).</p>
MANAGEMENT ISSUES		<p><b>Fire:</b> No parts of the site were burnt more than twice in the period 1997-2005, but large-scale fires can occur. The change from a fire regime of small-scale mosaic burning to large wildfires will potentially affect the site's conservation values (NRETA 2005).</p> <p><b>Feral animals:</b> Camel, horse and rabbit occur in the site. The threatened Quandong (<i>S. acuminatum</i>) is a favourite food of camels, and increasing numbers of camels are having a significant impact on quandong populations (P. and A. Severin, Curtin Springs, pers. comm.).</p> <p><b>Weeds and invasive exotic species:</b> Athel pine <i>Tamarix aphylla</i> (Weed of National Significance), saffron thistle <i>Carthamus lanatus</i> (category B weed) and buffel grass <i>Cenchrus ciliaris</i> are recorded from this site. Couch grass <i>Cynodon dactylon</i> is also likely to be present and spreading along Karinga Creek (A. Duguid, NRETAS, pers. comm.).</p> <p><b>Other:</b> Mining exploration licenses exist over part of the site due to interest in commercial exploitation of lake bed deposits (gypsum, salts, clays, zeolite), but the current status of exploration within the site is unknown.</p> <p>This site is poorly surveyed for plants and birds.</p>
MANAGEMENT INFORMATION	<b>NRM groups</b>	Centralian Land Management Association (CLMA), Alice Springs.
	<b>Protected areas</b>	The site is not within the formal network of protected areas within the NT.
	<b>Current management plans</b>	<p><b>Site-specific plans:</b> A Resource Assessment Towards a Conservation Strategy for the Finke Bioregion (Neave <i>et al.</i> 2004).</p> <p><b>National recovery plans for threatened species:</b> Greater Bilby (Pavey 2006).</p> <p><b>Other management plans:</b> Australian Weeds Strategy (NRMCC 2007).</p>
	<b>Monitoring programs and research projects</b>	<p>A program has been ongoing for the past 20 years eradicating athel pine along the Finke River from Finke Gorge to Horseshoe Bend Station. In 2004, 130 km of the Karinga Creek, downstream from Mount Ebenezer roadhouse, east over the highway onto Idracowra pastoral lease, was treated for athel pine infestation (Weeds Management Branch NRETAS and CLMA).</p> <p>There are seven Tier 1 rangeland monitoring points within this site (Karfs and Bastin 2001).</p> <p>Across the NT, fire 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>

<b>KEY REFERENCES</b>	<b>Management recommendations</b>	<p>Investigate possible Ramsar listing (NRETA 2005).</p> <p>Review status of Lake Eildunda for inclusion in the Directory of Important Wetlands in Australia (NRETA 2005).</p> <p>Establish a survey program to assess conservation and cultural values and develop appropriate conservation management programs (NRETA 2005).</p> <p>Broadscale heavy control of camels is needed across tenures and jurisdictions in Central Australia (P. and A. Severin, Curtin Springs, pers. comm.).</p>
	<b>Papers and reports</b>	<p>Duguid, A., Barnetson, J., Clifford, B., Pavey, C., Albrecht, D., Risler, J. and McNellie, M. (2005). <i>Wetlands in the arid Northern Territory. A report to the Australian Government Department of the Environment and Heritage on the inventory and significance of wetlands in the arid NT</i>. Northern Territory Government Department of Natural Resources, Environment and the Arts. Alice Springs.</p> <p>Jacobson, G. (1996). The interrelationship of hydrogeology and landform in central Australia. In: <i>Exploring central Australia: society, the environment and the 1894 Horn Expedition</i> (Eds. Morton, S.R. and Mulvaney, D.J.) Surrey Beatty and Sons, Chipping Norton. Pp. 249-266.</p> <p>White, M., Albrecht, D., Duguid, A., Latz, P. and Hamilton, M. (2000). <i>Plant species and sites of botanical significance in the southern bioregions of the Northern Territory; volume 2: significant sites</i>. A report to the Australian Heritage Commission from the Arid Lands Environment Centre. Alice Springs, Northern Territory of Australia.</p>
	<b>Contributors</b>	<p>Chris Brown, Weeds Management, NRETAS, Alice Springs.</p> <p>Angus Duguid, Biodiversity Conservation, NRETAS, Alice Springs.</p>



**Karinga Creek system from Mount Connor Outlook (Photo: Chris Pavey)**