Lake Surprise and the Lander River floodout swamps

Location and Description

Lake Surprise (Yinapaka) is located in the Tanami Desert, about 250 km south-west of Tennant Creek. The lake sits in the alluvial sandy deposits of the Lander River, which is its major source of water. The Lander River flows relatively frequently; has a number of long-lasting (but not permanent) waterholes and swamps; and supports the longest area of braided floodout in Northern Territory arid zone. The east and west shores of the Lake are marked by some of the largest sand dunes in the Northern Territory, which rise 20 m above the surrounding plains. The Lake is largely wooded by white-trunked coolabah *Eucalyptus victrix*.

Tenure and Land Use

This Site is Aboriginal freehold land held by three Aboriginal land trusts (Central Desert, Wirliyajarryi and Karlantijpa North). The Site supports Indigenous use and is within the proposed Southern Tanami Indigenous Protected Area. Willowra community (population 272) is 26 km south of the Site.

Significance Rating

National Significance

Ecological Values

When fully inundated, Lake Surprise forms the largest body of fresh water in the Tanami Desert, and is a major drought refuge for numerous waterbird species. The Site provides habitat for six threatened species including populations of Bilby, Brush-tailed Mulgara and the dwarf desert spike-rush. Several endemic plant taxa occur within the Site, and restricted range plant species occur in the sand dune systems to the east of Lake Surprise.

Management Issues

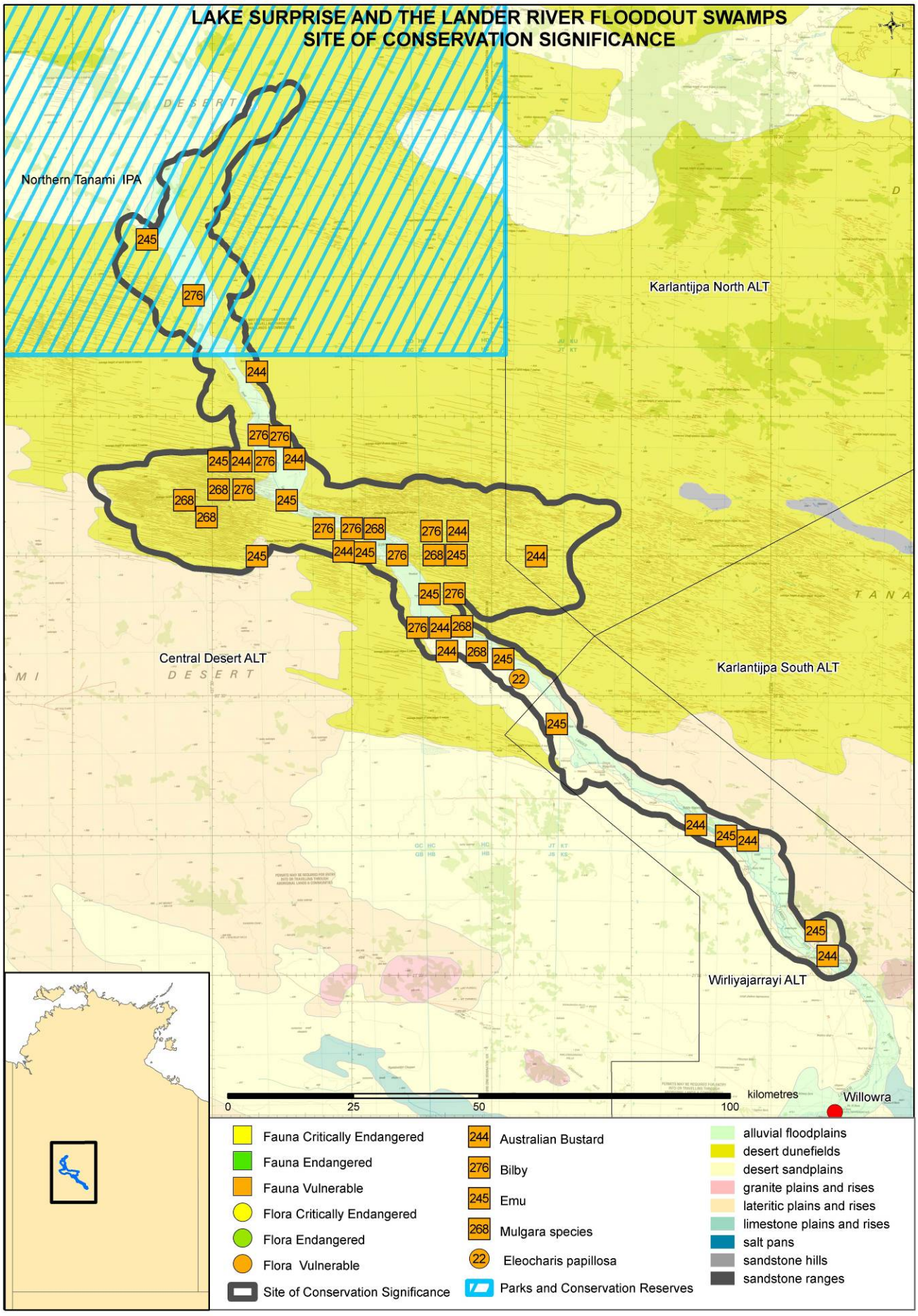
Invasion by buffel grass and uncontrolled summer wildfires are significant management issues. Feral animals such as fox, cat, camel and rabbit are also likely to affect the conservation values of the Site.

Condition

No information located.

Current Conservation Initiatives

The northern section of the Site is within the Northern Tanami Indigenous Protected Area, and the southern section of the Site is within the proposed Southern Tanami Indigenous Protected Area. A Plan of Management is being developed for the area as part of the Southern Tanami Indigenous Protected Area development process, which includes weed control and mapping, threatened species monitoring, fauna surveys, fire management and monitoring, cultural heritage protection and feral animal management. The Warlpiri Rangers have conducted controlled burns in the area during 2008 to protect Bilby habitat, and have been engaged in feral animal and threatened species monitoring, fauna surveys and weed mapping and control. In 2009 trials of the dingo-proof fox baiting device will be expanded to core Bilby populations on the Lander River by the Warlpiri Rangers


LAKE SURPRISE AND THE LANDER RIVER FLOODOUT SWAMPS
SITE OF CONSERVATION SIGNIFICANCE
Northern Tanami IPA
Karlantijpa North ALT
Karlantijpa South ALT
Central Desert ALT
Wirliyajarrayi ALT
DESERT
TANA
245
276
244
268
22
0
25
50
100
kilometres
Willowra
Fauna Critically Endangered
Fauna Endangered
Fauna Vulnerable
Flora Critically Endangered
Flora Endangered
Flora Vulnerable
Site of Conservation Significance
Australian Bustard
Bilby
Emu
Mulgara species
Eleocharis papillosa
Parks and Conservation Reserves
alluvial floodplains
desert dunefields
desert sandplains
granite plains and rises
lateritic plains and rises
limestone plains and rises
salt pans
sandstone hills
sandstone ranges

LOCATION	**SOCS Number**	44 (NT Parks and Conservation Masterplan Map Number 61)
	Latitude/Longitude	20 º 11´ South, 131 º 48 East (at centre)
	Bioregion	Tanami
	Description	This site encompasses the lower section of the Lander River, the larger Lake Surprise area including the surrounding dunefields, and the Lander River floodout swamps north-west of the lake. It has an area of 3681 km². The boundary of the site is delineated following the Site of Botanical Significance boundary described by White *et al.* (2000), with extensions to include wetland areas and the lower Lander River, plus a 2 km buffer applied to the whole site. Lake Surprise is largely wooded by white-trunked coolabahs *Eucalyptus victrix* (Duguid 2005); surrounding woodland is dominated by *Eucalyptus microtheca;* and *E. camaldulensis* occurs in parts of the nearby floodout (White *et al.* 2000). M*elaleuca glomerata* fringe floodout areas of the Lander River and dominate some areas of the lake bed (Duguid 2005).
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. **Plants** ▪ Dwarf desert spike-rush *Eleocharis papillosa* (VU/VU) This plant occurs in the Lander River floodout swamps upstream of the Lake and may also occur in Lake Surprise (Duguid 2005). **Vertebrates** ▪ Australian Bustard *Ardeotis australis* (-/VU) ▪ Emu *Dromaius novaehollandiae* (-/VU) ▪ Brush-tailed Mulgara *Dasycercus blythi* (VU/VU) ▪ Bilby *Macrotis lagotis* (VU/VU) ▪ Southern Marsupial Mole *Notoryctes typhlops* (EN/VU) A further five threatened species are recorded from the site but are believed to now be locally extinct (Brush-tailed Bettong *Bettongia penicillata*, Common Brushtail Possum *Trichosurus vulpecula vulpecula*, Golden Bandicoot *Isoodon auratus*, Mala *Lagorchestes hirsutus* and Western Quoll *Dasyurus geoffroii*). The Warlpiri Rangers recorded Spectacled Hare-wallaby (near threatened in the Northern Territory) sign and scats within the site during 2007/2008 (J. Young, CLC, pers. comm.).
ENDEMIC SPECIES	**Significance Rating**	**Regional Significance**
	Notes	**Endemic to the site:** One plant species *Lindernia* sp. Willowra is known only from this site. **Endemic to the bioregion:** One frog species (Tanami Toadlet *Uperoleia micromeles*) and one plant species (*Olax spartea*) reported from this site are known only from the Tanami bioregion. **Endemic to the NT:** Seven plant species reported from this site are endemic to the NT (*Bonamia deserticola, Corymbia sphaerica, Eleocharis papillosa, Euphorbia petala, Heliotropium subreniforme, Lindernia* sp. Willowra and *Sauropus huntii*). **Other:** The Tanami Ctenotus (*Ctenotus tanamiensis)* which only occurs in the south west of the Tanami Desert is recorded from this site. Three plant species recorded from the site are only found in the Tanami bioregion within the NT but also occur in other states (*Acacia sabulosa, Indigofera ammobia* and *Comesperma* sp. *Tanami*).
WILDLIFE AGGREGATIONS	**Significance Rating**	**Regional Significance**
	Marine turtles	Not applicable
	Seabirds	None known
	Waterbirds	As Lake Surprise retains water after rainfall events, it is considered to be a major drought refuge for birds in a region largely devoid of significant waterbodies (Gibson 1986). This site does not support regular or large aggregations of waterbirds but 15 species are recorded for the site and in an opportunistic aerial survey in September 2001, a total of 3,417 waterbirds/shorebirds were counted at Lake Surprise (Duguid 2005).
	Shorebirds	This site is not known to support regular shorebird aggregations, however four shorebird species are recorded at Lake Surprise.
	Other aggregations	None known
WETLANDS	**Significance Rating**	**National Significance (possible International)**
	Ramsar criteria met	Wetland areas within the site are not listed under the Ramsar Convention, however Duguid *et al.* (2005) conducted an assessment of the Lander River floodout swamps and waterholes using the criteria for listing as a wetland of international importance under the Ramsar convention. They concluded that this site meets Criterion 2.
	DIWA criteria met	Lake Surprise is listed in the Directory of Important Wetlands with details as follows: ID: NT019 Lake Surprise. Criteria met: 1, 2, 3. Wetland types: A6 An assessment of the Lander River Floodout Swamps and Waterholes against DIWA criteria by Duguid *et al.* (2005) concluded that they meet Criteria 1, 4 and 5.

	Notes	This site has been nominated as a national High Conservation Value Aquatic Ecosystem (the finalised list of HCVAE will replace the DIWA list). Lake Surprise, when full, is the largest body of freshwater in the Tanami Desert and is in relatively pristine condition. The lake is fed primarily by the Lander River, which originates some 250 km to the south-east in the Reynolds Range. Inundation of the Lake is episodic and it retains water from rainfall events for a few weeks or months every few years, but sometimes may remain inundated for two to three years (DIWA). Curlew, Dingo and Bottle Waterholes occur in the lower section of the Lander River.
	Rivers	The Lander River is the largest arid NT river that is not in the Lake Eyre basin, and is second longest river in the arid NT. It has a number of temporary but long-lasting waterholes along its course, some of which can persist for over a year after inundation. One example is Dingo waterhole, which is up to 4 m deep when full and is nearly 1 km in length (Duguid 2005). The stretch of the Lander River between Curlew Waterhole and the Lake Surprise becomes widely braided across a floodplain in channels of varying widths, and is the longest section of braided floodout in the NT, at around 42 km (as mapped from satellite imagery (Duguid 2005).
FLORA	**Significance Rating**	**Not Significant**
	Notes	**Restricted range species:** Four species reported for the site have restricted ranges within the NT (*Pimelea ammocharis, Acacia jensenii, Neobassia astrocarpa* and *Glycine pullenii*). **Relictual species:** One relictual plant species is reported for the site (*Fimbristyllis velata*).
OTHER ENVIRONMENTAL VALUES		Lake Surprise was part of the former Tanami Desert Wildlife Sanctuary and the former sanctuary is listed on the Register of the National Estate for natural values (Australian Heritage Council). Lake Surprise is recognised by Morton *et al.* (1995) as being a significant refuge area; by Duguid *et al.* (2005) as being significant for biodiversity conservation; and by White *et al.* (2000) as a Site of Botanical Significance. Pastoralists introduced Spangled grunters into permanent bore-fed waters in the area and these fish now occur in the lake and river (DIWA). There are six migratory species recorded for this site that are listed under international conventions or bilateral agreements protecting migratory animals.
MANAGEMENT ISSUES		**Fire:** In the period 1997-2005, most parts of the site (63%) were burnt fewer than two times and no parts of the site were burnt more than four times. An increased occurrence of uncontrolled summer wildfires around this site (J. Young, CLC, pers. comm.) is believed to be unfavorable for threatened species such as the Greater Bilby (Pavey 2006) and Great Desert Skink (McAlpin 2001). **Feral animals:** Feral cat and fox are known to occur in the site and are likely to impact threatened species. Camel are present and causing damage to sites of cultural significance and wetland areas (J. Young, Central Land Council, pers. comm.). **Weeds and invasive exotic species:** Buffel grass *Cenchrus ciliaris* occurs in the site, and the further spread of this species may affect conservation values (NRETA 2005). **Other:** No information located
MANAGEMENT INFORMATION	**NRM groups**	Warlpiri Rangers.
	Protected areas	The northern area of the Site is within the Northern Tanami Indigenous Protected Area, and the southern area of the Site is within the proposed Southern Tanami Indigenous Protected Area.
	Current management plans	**Site-specific plans:** No information located. **Recovery plans for threatened species:** Greater Bilby (Pavey 2006); Southern Marsupial Mole (Benshemesh 2004); Tjakura/ Great Desert Skink (McAlpin 2001); Brush-tailed Mulgara (SA Department of Environment and Heritage 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 by the European Red Fox (Environment Australia, 1999).
	Monitoring programs and research projects	During 2008 Warlpiri Rangers conducted feral animal and threatened species monitoring, fauna surveys, controlled burning to protect Bilby habitat and weed mapping and eradication (J. Young, CLC, pers. comm.). Regular annual species monitoring in the Lake Surprise area conducted by the Warlpiri Rangers is currently proposed (J. Young, CLC, pers. comm.). The Central Land Council is supporting NRM board Indigenous Ecological Knowledge (IEK) projects for this area to inform ongoing management under an Indigenous Protected Area (J. Young, CLC, pers. comm.). Across the NT, fire is mapped continuously under the North Australia Fire Information Project http://www.firenorth.org.au/nafi/app/init.jsp
	Management recommendations	Undertake capacity building with community ranger group to implement conservation management programs (NRETA 2005). Develop an integrated natural and cultural resource management plan for the area under the Southern Tanami Indigenous Protected Area (J. Young, CLC, pers. comm.). Control fox and camel populations (NRETA 2005). Improve management of fire (NRETA 2005). Undertake strategic aerial burning in the Lake Surprise dune fields to mitigate against large scale wildfires (J. Young, CLC, pers. comm.). Control spread of buffel grass (NRETA 2005).

KEY REFERENCES

Papers and reports	Duguid, A., Barnetson, J., Clifford, B., Pavey, C., Albrecht, D., Risler, J. and McNellie, M. (2005). *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.* Northern Territory Government Department of Natural Resources, Environment and the Arts. Alice Springs. Latz, P. (1988). *Botanical Significance of the Lake Surprise Dunefield Area. Part 1.* Conservation Commission of the Northern Territory, Alice Springs. White, M., Albrecht, D., Duguid, A., Latz, P. and Hamilton, M. (2000). *Plant species and sites of botanical significance in the southern bioregions of the Northern Territory; volume 2: significant sites.* A report to the Australian Heritage Commission from the Arid Lands Environment Centre. Alice Springs, NT.
Contributors	James Young, Central Land Council, Alice Springs

The braided channels of the Lander River (Photo: Ken Johnson)

Lake Surprise after an inundation event (Photo: Ken Johnson)