

Lake Sylvester system

Location and Description

The vast ephemeral Lake Sylvester system is located on the Barkly Tableland, about 180 km east-north-east of Tennant Creek. It comprises four principal basins (Sylvester, Corella, De Burgh, and 'West Corella'), and is one of the largest and most outstanding natural freshwater wetlands of the Australian inland, in terms of both its physical and biological features. The size of the inner basins of individual lakes vary from 100 to 300 km², but in exceptionally wet years (such as 2001) the lakes join to form a single "mega-lake" with an area of about 2 000 km². The lakes provide a diversity of wetland habitats, including broad areas of grassland, lignum and bluebush shrublands, and fringing areas of open eucalypt and acacia woodland.

Tenure and Land Use

This entire lake system is on pastoral leasehold land, and lies within one pastoral lease (Brunette Downs). The main land use within the Site and broader catchment is cattle grazing on native pastures.

Significance Rating

International Significance

Ecological Values

This wetland system of great size and diversity - habitats include grassy, shrubby and wooded swamp, and open lake with bare muddy shore - attracts many hundreds of thousands of waterbirds when fully flooded. During these inundations, the lake system supports internationally significant numbers of at least nine waterbird species. Major waterbird breeding events typically occur after flooding, then receding waters provide habitat for migratory shorebirds.

Management Issues

Parkinsonia aculeata is likely to be an ongoing management issue at this Site. Successful control has been achieved over much of the lake system, but control needs to be catchment-wide and ongoing. Grazing pressure from cattle may potentially have some effects on the conservation values of the site, such as reducing regeneration of woody plant.

Condition

Little is known of the condition of the lake system or the vegetation.



Current Conservation Initiatives

A 100 ha stock enclosure was established on the far north-eastern edge of Lake Sylvester in the mid 1980s. This enclosure is an important ungrazed reference area, where vegetation and regeneration have been monitored in past years, but the current state of the fence around the enclosure is unknown. The landholder has greatly reduced, if not eliminated, *Parkinsonia aculeata* from this Site. Surveys of waterbirds are conducted opportunistically by Wetlands International after major flood events.

LAKE SYLVESTER SYSTEM - SITE OF CONSERVATION SIGNIFICANCE

LOCATION	SOCS Number	42 (NT Parks and Conservation Masterplan Map Number 56)
	Latitude/Longitude	18° 48' South, 135° 38' East (at centre)
	Bioregion	Mitchell Grass Downs
	Description	<p>This site includes four principal basins (Sylvester, Corella and De Burgh Lakes, and the unofficially named "West Corella Lake") and a network of surrounding interconnected wetlands. The site is dominated by clay plains but low chenier ridges occur in several places on the shorelines of Lake Sylvester and Corella Lake and give some indication of the boundaries of individual wetlands.</p> <p>There are two major near-permanent waterholes in this system: Big Hole in the lower reaches of Brunette Creek; and Corella Hole in the lower reaches of Corella Creek.</p> <p>The size of the inner basins (most frequently flooded basins) of individual lakes varies from Corella Lake (100 km²), to Lake de Burgh (300 km²) and Lake Sylvester (150 km²), but the boundary of this site is delineated based on the maximum flooded area of the lake system with a 2 km buffer, and encompasses an area of 2607 km².</p> <p>Of the main lakes, Lake Sylvester is the most frequently inundated basin, supplied principally by Brunette Creek which has a substantial catchment to the north-east. Other lakes are supplied by local creeks (Corella Creek, Playford River) and overflow from larger basins.</p> <p>The lakes are shallow and seasonal but can retain water for more than 12 consecutive months after substantial floods. Extensive inundation of individual lakes probably occurs every three to five years with major flooding every five to ten years (1993, 2001 and 2006).</p> <p>Other large wetlands on the Barkly Tableland, including Lake Woods, Tarrabool Lake and Eva Downs Swamp are also recognised as sites of high conservation significance in the NT.</p>
THREATENED SPECIES	Significance Rating	Regional 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)	<p>Two threatened species are reported from this site.</p> <p>Vertebrates</p> <ul style="list-style-type: none"> ▪ Australian Bustard <i>Ardeotis australis</i> (-/VU) ▪ Australian Painted Snipe <i>Rostratula australis</i> (VU/VU) <p>There are few records of the Australian Painted Snipe in the Northern Territory but there are historical records from the Lake Sylvester system, Brunette Creek, and Playford River. The highly secretive species might still occur occasionally (if not regularly) in the lake system because in 1993 it was observed in similar shrubland habitat at Lake Woods, and was documented breeding at Tarrabool Lake approximately 60 km to the north-west; suitable habitat is abundant at Lake Sylvester (Jaensch 2003a; R. Jaensch, Wetlands International, pers. comm.).</p>
ENDEMIC SPECIES	Significance Rating	Not Significant
	Notes	<p>Endemic to the bioregion: One plant species recorded from the site is endemic to this bioregion and to the NT (<i>Bergia barklyana</i>).</p> <p>Endemic to the NT: One plant species recorded from the site is endemic to the NT.</p> <p>Other: One plant species is only found in the Mitchell Grass Downs bioregion within the NT, but is also found in other bioregions in other states (<i>Corchorus pascuorum</i>).</p> <p>A number of plant and vertebrate species recorded from this site are largely restricted to the cracking-clay grasslands occurring within the Mitchell Grass Downs bioregion (Fisher <i>et al.</i> 2002).</p>
WILDLIFE AGGREGATIONS	Significance Rating	International Significance
	Marine turtles	Not applicable
	Seabirds	<p>In wet years, significant numbers of terns feed aerially over the lakes and surrounding grassland and some species breed in the system.</p> <p>A maximum count of 8720 Gull-billed Terns in 1995 (Jaensch and Bellchambers 1997) is internationally significant (> 1% global population; G. Dutson in prep.).</p> <p>At least 1350 pairs of Gull-billed Terns bred at Lake Sylvester in 1995 (Jaensch and Bellchambers 1997); this is the largest documented breeding colony of this species in Australia (R. Jaensch, Wetlands International, pers. comm.).</p> <p>Caspian Terns and Whiskered Terns also breed on islands or floating grass mats in the system, and large numbers of the migratory White-winged Black Tern (1700 in 2002) can occur in wetter years (Wetlands International unpubl.).</p>

WETLANDS	Waterbirds	<p>Total numbers of waterbirds: Significant numbers of waterbirds use this lake system opportunistically after substantial inundation. Individually, lakes Sylvester and De Burgh can each support over 20 000 waterbirds after moderate fills (Jaensch and Bellchambers 1997; Wetlands International unpubl.), while numbers can swell to many hundreds of thousands of birds in exceptionally wet years. Estimates from aerial surveys include 270 000 in June 2001 and 450 000 in April 2002 (Wetlands International unpubl.), but these counts are likely to underestimate real numbers considerably (Costelloe et. al. 2004; Morton <i>et al.</i> 1990) and it is possible that closer to a million waterbirds were present in 2001/02 (R. Jaensch, Wetlands International, pers. comm.).</p> <p>Counts of individual species: Maximum counts of species that are internationally significant (>1% global population; Dutton in prep.) include: 60 000 Grey Teal; 14 000 Hardhead; 160 000 Eurasian Coot; 17 000 Little Black Cormorant; 7700 pairs Australian Pelican (Wetlands International unpubl.); 26 000 Plumed Whistling-Duck; 13 000 Straw-necked Ibis (Jaensch and Bellchambers 1997).</p> <p>Breeding records: After major flooding, this lake system often supports some of the largest known inland waterbird colonies of some species in the NT and northern Australia. To date 26 waterbird species have been reported breeding in the lake system and colonies of note include the following: Australian Pelican – the largest colonies include 6000 pairs near Big Hole in June 2001 and 7700 pairs at same location in April 2002 (Wetlands International unpubl.). The latter is the largest documented breeding colony of this species in the NT and one of the largest documented for tropical Australia (R. Jaensch, Wetlands International, pers. comm.). Glossy Ibis – A colony of 3000 pairs nested in lignum in March 2006 (Wetlands International unpubl.) and this is the largest documented inland colony of this species in the NT and one of the largest in tropical Australia (R. Jaensch, Wetlands International, pers. comm.). Other breeding records of note include: 2000 pairs of Straw-necked Ibis; 1000 pairs of Great Egret; and 1000 pairs of Intermediate Egret (Wetlands International unpubl.), and these are some of the largest inland colonies of these species known in tropical Australia (R. Jaensch, Wetlands International, pers. comm.). Smaller numbers of Nankeen Night Heron, Royal Spoonbill, Little Black Cormorant, Pied Cormorant, Australasian Darter, and Magpie Geese are also reported breeding in the system (Wetlands International unpubl.). The Freckled Duck is regularly seen in small numbers at Lake Sylvester system after major floods and the only confirmed breeding record for the NT is a family group in south-eastern Lake Sylvester in June 2001 (Jaensch 2003b).</p> <p>Diversity of species: At least 65 waterbird species occur at this site (Wetlands International unpubl.) and this is considered very high for an inland wetland (R. Jaensch, Wetlands International, pers. comm.).</p>
	Shorebirds	<p>Total numbers of shorebirds: As water recedes from this lake system after inundation, vast areas of shallow water and exposed mud are available as feeding areas for shorebirds. Other grassland feeding species also periodically frequent the site in significant numbers. Over 10 000 shorebirds have been recorded at such times, and numbers are often dominated by Oriental Pratincoles (>15 000 in 1993: Jaensch 1994b).</p> <p>Counts of individual species: Maximum counts of species that are internationally significant (> 1% East Asian-Australasian Flyway population; Bamford <i>et al.</i> 2008) include: 1350 Australian Pratincole; and 1034 Oriental Plover (Jaensch and Bellchambers 1997).</p> <p>Counts of the Little Curlews have not been exceptionally high in this system to date (Jaensch & Bellchambers 1997), but based on overall abundance in the Barkly region the lakes are likely to support internationally significant numbers. Another record of note for the site is 112 Black-tailed Godwits (Jaensch and Bellchambers 1997).</p>
	Other aggregations	<p>Flock Bronzewing Pigeons frequent the Barkly wetlands with numbers up to 100 000 reported drinking at Lake Sylvester (R. Jaensch pers. obs. 1993).</p> <p>The wetlands environments may also be important source areas for the highly irruptive Long-haired Rat, whose numbers reach “plague” proportions in some years (Carstairs 1974, 1976). Irruption of this species is the lynchpin of a system that then supports dense aggregations of snakes and raptors.</p>
	Significance Rating	International Significance
Ramsar criteria met	<p>Although no formal assessment has been conducted to date, the Lake Sylvester system is likely to meet at least five of the criteria for listing as a Wetland of International Importance under the Ramsar Convention, including criterion 1: rare or unique example of a wetland type; criterion 2: supports threatened species or communities; criterion 4: provides refuge or supports a critical life-cycle stage for important species; criterion 5: important wildlife aggregation site with >20 000 waterbirds; and criterion 6: regularly supports >1% of the individuals in a population. Some of the individual lakes are also likely to meet some criteria for Ramsar listing on their own.</p>	
DIWA criteria met	<p>The three named lakes in this system are listed as wetlands of national significance in the Directory of Important Wetlands in Australia (DIWA).</p> <p>Lake de Burgh (NT011) meets criteria 1, 2, 3, 4 and includes DIWA wetland types B6, B13 and B14.</p> <p>Lake Sylvester (NT012) meets criteria 1, 2, 3, 4, 6 and includes DIWA wetland types B6, B13, B1, B10, B14.</p> <p>Corella Lake (NT009) meets criteria 1, 2, 3 and includes DIWA wetland types B6, B13, B14, B1.</p>	
Notes	<p>In exceptionally wet years when the lakes are joined, they form one of the largest freshwater wetlands in inland Australia (DIWA). Many wetlands are characterized by variable extent of inundation and thus variable area and depth, and this is an especially pronounced feature of the Barkly wetlands.</p> <p>The combined Barkly Lakes (Eva Downs Swamp, Lake Sylvester and Tarabool Lake system) have been nominated as a national High Conservation Value Aquatic Ecosystem (the finalised list of HCVAE will replace the DIWA list), and form a priority HCVAE in the Caring for our Country Business Plan 2009-2010 (Commonwealth of Australia 2008).</p>	

LAKE SYLVESTER SYSTEM - SITE OF CONSERVATION SIGNIFICANCE

	Rivers	No information located
FLORA	Significance Rating	Regional Significance
	Notes	<p>Restricted range species: Four plant species recorded in this site have a restricted range within the NT (<i>Commelina tricarinata</i>, <i>Senecio depressicola</i>, <i>Iotasperma sessilifolium</i>, <i>Urochloa atrisola</i>).</p> <p>Periodically after major flood events, the lakes may support huge circular mats of the aquatic plants <i>Potamogeton tricarinatus</i> and <i>Myriophyllum verrucosum</i>, which contribute to high water clarity in the lakes (R. Jaensch pers. obs. 2001).</p>
OTHER ENVIRONMENTAL VALUES		<p>The Lake Sylvester System is proposed to be nominated by Birds Australia as an internationally-recognized <i>Important Bird Area</i> (G. Dutton in prep.).</p> <p>Lake Sylvester is identified as an internationally important site for migratory shorebirds in the East Asian-Australasian Flyway (Bamford <i>et al.</i> 2008).</p> <p>Lake Sylvester is identified as a site of significant refugia for biological diversity in arid and semi-arid Australia due to its importance as a breeding and migratory stop-over location for waterfowl in the sub-tropical inland of the NT (Morton <i>et al.</i> 1995).</p> <p>The Yellow Chat is a characteristic bird of the Barkly wetlands and aggregations of tens if not hundreds of birds occur in bluebush at this site after substantial rains (R. Jaensch pers. obs. 1993).</p> <p>Letter-winged Kites sometimes nest in small colonies in the eucalypt trees along Corella Hole and the shore of Lake Sylvester (R. Jaensch pers. obs. 1993).</p> <p>At least 21 species recorded from this site are listed under international conventions or bilateral agreements protecting migratory animals.</p> <p>Although fish have been sampled in many creeks on the Barkly Tableland (Midgley 1982) and there has been some opportunistic collections in the region (H. Larson, MAGNT, pers. comm.), the fish fauna of the Barkly Lakes is poorly known. The lake system is however, expected to hold immense numbers of fish given the great numbers of fish-eating pelicans and cormorants that they support intermittently.</p> <p>The Lake Sylvester and De Burgh System and the Corella Lake System are listed on the Register of the National Estate for their natural values (Australian Heritage Council).</p> <p>Sub-humid wetlands like the Barkly Lakes are likely to become increasingly important in the coming decades if global climate change drives even minor rises in sea level, and saltwater inundation occurs on the vast floodplain wetlands of coastal northern Australia.</p> <p>The Lake Sylvester system includes two areas that were identified as botanically significant in White <i>et al.</i> (2000), but these areas don't satisfy the current criteria.</p>
MANAGEMENT ISSUES		<p>Fire: Pastoral management generally seeks to suppress fire and in the period 1997-2005, 100% of the site was burnt in fewer than two years.</p> <p>Feral animals: The site is within the relatively intensively managed pastoral estate, and numbers of feral grazers are low. Feral cats are common in this region, and very numerous following irruptions of the native long-haired rat <i>Rattus villosissimus</i>.</p> <p>Weeds: One Weed of National Significance <i>Parkinsonia aculeata</i> was widespread in the northern part of the lake in the past, but active management has greatly reduced, if not eliminated it from this site. Major infestations are likely to remain on some upstream properties with high potential for downstream re-infestation. No other declared or high priority weeds are known from this site.</p> <p>Other: Heavy or continuous grazing by livestock is likely to limit regeneration of tree and shrub species and cause pugging and soil compaction on wet soil.</p> <p>Occasional use of speed boats on the waterholes on Brunette Creek may disturb congregatory waterbirds and late nesting species and could be avoided with considerate timing of boating activity.</p>
MANAGEMENT INFORMATION	NRM groups	Barkly Landcare and Conservation Association (Tennant Creek).
	Protected areas	Headingly's enclosure (100 ha/ 1 km ²) is located on north-eastern edge of Lake Sylvester but this has no tenured protection.
	Current management plans	<p>Site-specific plans: No information located.</p> <p>Other management plans: Australian Weeds Strategy (NRMMC 2007); Threat Abatement Plan for Predation by Feral Cats (Environment Australia, 1999).</p>
	Monitoring programs and research projects	<p>Aerial and ground surveys of waterbirds are conducted opportunistically by Wetlands International after major flood events (R. Jaensch, Wetlands International, pers. comm.).</p> <p>Vegetation condition has been monitored annually at transects established in and nearby the Headingly's enclosure during the 1990s (G. Allen, NRETAS unpubl.).</p> <p>There are six Tier 1 rangeland monitoring points within this site (Karfs and Bastin 2001).</p> <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>Management recommendations</p>	<p>Conduct a comprehensive assessment of the threats to the site and develop a formal management plan to address significant threats, including weed control and management of grazing pressure.</p> <p>The management plan may also investigate opportunities for stock exclusion areas and appropriate management of the site to maintain conservation values.</p> <p>In cooperation with landholders, determine the benefits of possible nomination as a wetland of international importance (Ramsar site) (NRETA 2005).</p> <p>Develop a conservation agreement and concept plan with the landholder to include the wetlands in the reserve system (NRETA 2005).</p> <p>Conduct detailed surveys and ongoing monitoring of waterbird and fish populations, vegetation condition and weeds within the site.</p> <p>Develop and implement a strategy to prevent and respond to fire which might threaten wetland vegetation.</p> <p>Regulate boating activity to minimize disturbance to waterbirds.</p>
<p>KEY REFERENCES</p>	<p>Papers and reports</p>	<p>DIWA (A Directory of Important Wetlands in Australia). <i>Australian Wetlands Database</i>. Department of Environment, Water, Heritage & the Arts, Canberra ACT (accessed July 2007).</p> <p>Jaensch, R.P. (1994a). <i>An inventory of wetlands in the sub-humid tropics of the Northern Territory</i>. Report to the Australian Nature Conservation Agency. Conservation Commission of the Northern Territory, Darwin.</p> <p>Jaensch, R. and Bellchambers, K. (1997). <i>Waterbird conservation values of ephemeral wetlands of the Barkly Tableland, Northern Territory</i>. Unpublished report to Australian Heritage Commission and Parks & Wildlife Commission of the Northern Territory, 76 pp.</p>
	<p>Contributors</p>	<p>Roger Jaensch, Wetlands International - Oceania, Brisbane</p> <p>Alaric Fisher, Biodiversity Conservation, NRETAS, Darwin</p>



Big Hole Pelican Colony, Lake Sylvester system (Photo: Roger Jaensch)



Ibis Colony, Lake Sylvester system (Photo: Roger Jaensch)