

## George Gill Range and surrounds

### Location and Description

The George Gill Range is located south-west of the Greater MacDonnell Ranges and 215 km west-south-west of Alice Springs. The Range is a large block of sandstone with a spectacular canyon (Watarrka or Kings Canyon) rising up to 270 m from Kings Creek on its western end. The southern face of the range is cut by several gorges containing springs and waterholes. Kings Creek flows south-west from the range into the Great Sandy Desert and Kings Creek floodout swamps. Major vegetation communities include spinifex grasslands with an overstorey of mixed open woodland, chenopod and mulga shrublands, and pockets of moisture-dependant species in sheltered gullies.

### Tenure and Land Use

Almost half of this Site is Crown leasehold land and the remaining portions are Aboriginal freehold land held by a number of Aboriginal Land Trusts. About 36% of the site is managed as a conservation reserve (Watarrka National Park) and used for conservation and tourism. Indigenous use and pastoral operations are the main land uses within the remainder of the site. Kings Canyon Resort and the Ulpanyali Aboriginal Community lie within the site.

### Significance Rating

International Significance

### Ecological Values

Sheltered gorges and gullies within the Site hold permanent and semi-permanent springs and rock holes and provide protected refuge areas for restricted range and relictual species. The diverse habitats support eleven threatened species including three plants, seven vertebrates and one invertebrate, and at least two land snail and two plant species are entirely restricted to the site. The Site also harbours numerous other plant species that are found only in the Northern Territory.

### Management Issues

Fire management is an ongoing issue within the Site, as illustrated by the impact of wildfires in 2002. Buffel grass is spreading in the Site and will potentially further affect the fire regime. Camel populations are degrading waterholes and vegetation, and increasing numbers of tourists may impact sensitive environments without careful management.

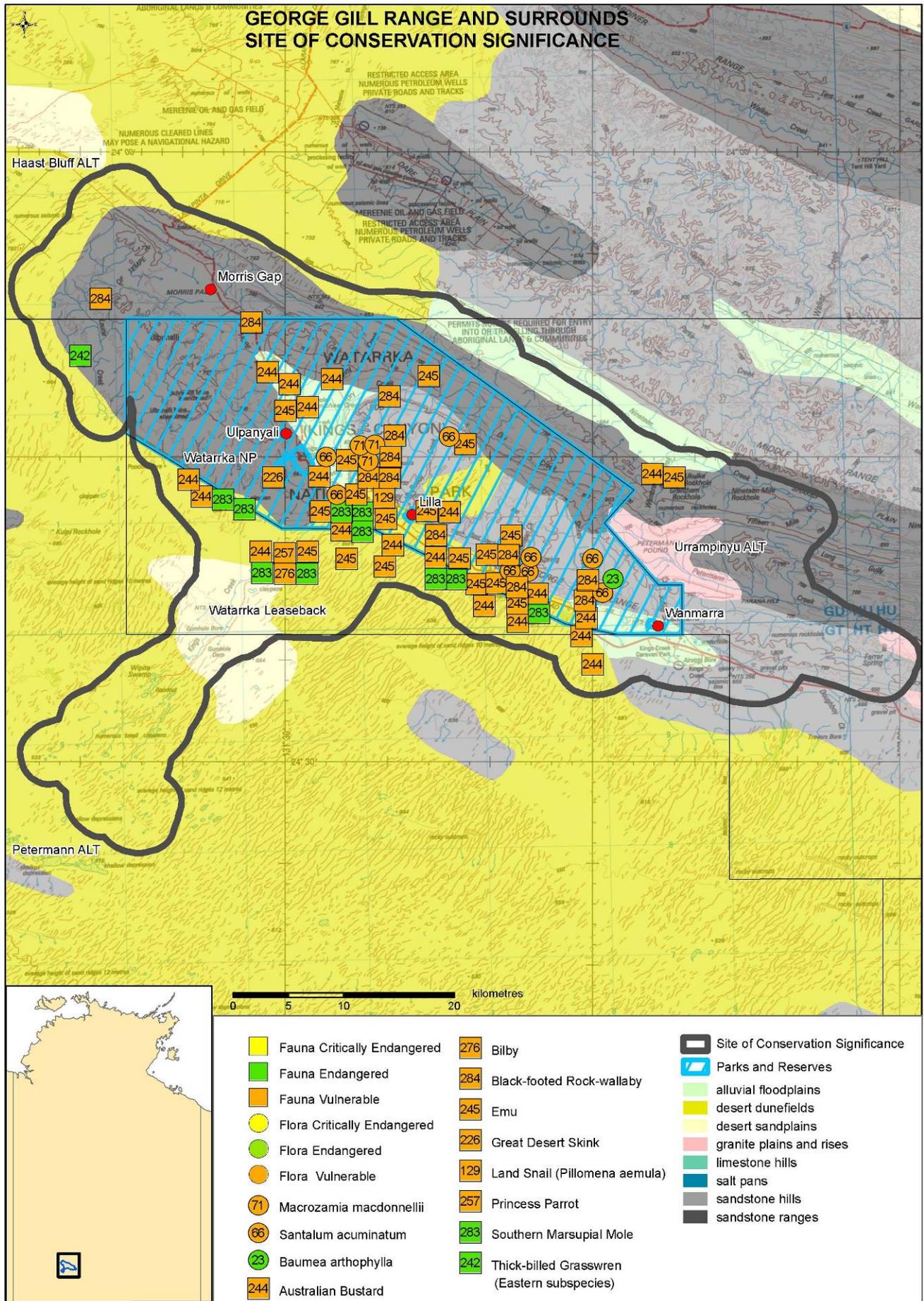


### Condition

Watarrka National Park has been largely ungrazed by stock since 1985 and this has allowed vegetation recovery, but there are extensive areas with fragile soils.

### Current Conservation Initiatives

Detailed mapping and surveys of flora and buffel grass have been conducted within Watarrka National Park and the resultant data layers help to inform management. Poorly surveyed vegetation communities within the park have been identified and prioritized for future fauna surveys. A management plan has been prepared for buffel grass and this invasive plant is targeted at key visitor areas. Camel populations within the park are managed and some populations of quandong *Santalum acuminatum* have been protected by fencing. Mala *Lagorchesites hirsutus* have been reintroduced to the park within an area fenced from predators.



GEORGE GILL RANGE AND SURROUNDS - SITE OF CONSERVATION SIGNIFICANCE

<b>LOCATION</b>	<b>SOCS Number</b>	58 (NT Parks and Conservation Masterplan Map Number 94)
	<b>Latitude/Longitude</b>	24° 17' South, 131° 35' East (at centre)
	<b>Bioregion</b>	MacDonnell Ranges (80%) Great Sandy Desert (20%)
	<b>Description</b>	<p>This site encompasses George Gill Range, Kings Canyon (Watarrka), the Kings Creek floodout, and surrounding areas. The boundary of the site follows that delineated by White <i>et al.</i> (2000) in identifying the Watarrka Site of Botanical Significance, but also includes threatened mammal and reptile habitat in surrounding areas and has a 2 km buffer added. The site encompasses an area of 1990 km<sup>2</sup>.</p> <p>Dominant vegetation communities within this site include hillside spinifex <i>Triodia brizoides</i> hummock grassland with mixed species low-open woodland overstorey; Hard spinifex <i>T. schinzii</i> hummock grassland with desert oak <i>Allocasuarina decaisneana</i> open-woodland overstorey between dunes; and hard spinifex <i>T. basedowii</i> or soft spinifex <i>T. pungens</i> Hummock grassland with blue mallee <i>Eucalyptus gamophylla</i> and acacia tall sparse-shrubland overstorey (White <i>et al.</i> 2000). Chenopod (primarily <i>Maireana astrotricha</i> and <i>Atriplex vesicarius</i>) and mulga (<i>Acacia macdonnellensis</i> and <i>A. aneura</i>) dominated communities also occur within the site.</p> <p>The Greater MacDonnell Ranges, 26 km north-east of this site, and Lakes Amadeus and Neale, 18 km to the south-west, are also identified as sites of high conservation significance in the NT.</p>
<b>THREATENED SPECIES</b>	<b>Significance Rating</b>	<b>International 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>11 threatened species are recently reported from this site.</p> <p><b>Plants</b></p> <ul style="list-style-type: none"> <li>▪ <i>Baumea arthropphylla</i> (-/NU)</li> <li>▪ MacDonnell Ranges Cycad <i>Macrozamia macdonnellii</i> (VU/NT)</li> <li>▪ Quandong <i>Santalum acuminatum</i> (-/NU)</li> </ul> <p><b>Vertebrates</b></p> <ul style="list-style-type: none"> <li>▪ Great Desert Skink <i>Egernia kintorei</i> (VU/VU)</li> <li>▪ Australian Bustard <i>Ardeotis australis</i> (-/VU)</li> <li>▪ Emu <i>Dromaius novaehollandiae</i> (-/NU)</li> <li>▪ Princess Parrot <i>Polytelis alexandrae</i> (VU/VU)</li> <li>▪ Black-footed Rock-wallaby <i>Petrogale lateralis</i> (VU/NT)</li> <li>▪ Mala <i>Lagorchestes hirsutus</i> (EN/EN) Mala have been reintroduced to the site in an area fenced off from predators.</li> <li>▪ Southern Marsupial Mole <i>Notoryctes typhlops</i> (EN/VU)</li> </ul> <p><b>Invertebrates</b></p> <ul style="list-style-type: none"> <li>▪ Land snail <i>Pillomena aemula</i> (-/NU) This is a rare microscopic snail known only from around Penny Springs and King's Canyon (V. Kessner pers. comm.) in the George Gill Range.</li> </ul> <p>Two threatened species recorded in the site are believed to now be locally extinct (Greater Bilby <i>Macrotis lagotis</i> and Thick-billed Grasswren <i>Amytornis textilis</i>).</p>
<b>ENDEMIC SPECIES</b>	<b>Significance Rating</b>	<b>National Significance</b>
	<b>Notes</b>	<p><b>Endemic to the site:</b> Two plant species are entirely restricted to the site (<i>Amperea spicata</i>, <i>Hydrocotyle</i> sp. Watarrka). The Land Snail (<i>Pillomena aemula</i>) and two species of Camaenidae land snail (<i>Sinumelon gillensis</i> and <i>Semotrachia bagoti</i>) are known only from some springs and other protected habitats within George Gill Range.</p> <p><b>Endemic to the bioregion:</b> One plant species recorded from this site (<i>Austrostipa centralis</i>) is known only from the MacDonnell Ranges bioregion.</p> <p><b>Endemic to the NT:</b> 12 plant species recorded from the site are found only in the NT (<i>Amperea spicata</i>, <i>Austrostipa aquarii</i>, <i>Austrostipa centralis</i>, <i>Eragrostis subtilis</i>, <i>Eremophila ovata</i>, <i>Goodenia larapinta</i>, <i>Hakea grammatophylla</i>, <i>Harnieria kempeana</i> subsp. <i>kempeana</i>, <i>Hydrocotyle</i> sp. Watarrka, <i>Macrozamia macdonnellii</i>, <i>Melaleuca faucicola</i> and <i>Sedopsis filsonii</i>).</p> <p>Two reptile species recorded from the site are NT endemics (Frost's Lerista <i>Lerista frostii</i> and Centralian Carpet Python <i>Morelia bredli</i>) and each has a highly restricted range. Centralian Tree Frog <i>Litoria gilleni</i> is also an NT endemic.</p> <p><b>Other:</b> 11 plant species recorded at the site are restricted to the MacDonnell Ranges bioregion within the NT but are also found in other states (<i>Baumea arthropphylla</i>, <i>Doodia caudata</i>, <i>Eleocharis pusilla</i>, <i>Euphorbia sarcostemmoides</i>, <i>Juncus kraussii</i> var. <i>australiensis</i>, <i>Maireana sedifolia</i>, <i>Mirbelia ramulosa</i>, <i>Persicaria decipiens</i>, <i>Polystichum proliferum</i>, <i>Pteris tremula</i>, <i>Swainsona colutooides</i>).</p>
<b>WILDLIFE AGGREGATIONS</b>	<b>Significance Rating</b>	<b>Not Significant</b>
	<b>Marine turtles</b>	Not applicable
	<b>Seabirds</b>	None known
	<b>Waterbirds</b>	None known
	<b>Shorebirds</b>	None known
	<b>Other aggregations</b>	None known

WETLANDS	<b>Significance Rating</b>	<b>National Significance</b>
	<b>Ramsar criteria met</b>	No wetland areas within this site are listed as Ramsar sites, however Duguid <i>et al.</i> (2005) assessed the George Gill Range springs and rockholes against criteria for listing as a wetland of international importance under the Ramsar convention and concluded that this site meets Criteria 1 and 3.
	<b>DIWA criteria met</b>	No wetland areas within this site are listed in the Directory of Important Wetlands in Australia (DIWA), however Duguid <i>et al.</i> (2005) assessed the George Gill Range springs and rockholes against DIWA criteria and concluded that they meet Criteria 1 and 3. Duguid (2005) identifies DIWA wetland types B1, B2, B9, and B17 occurring in the area.
	<b>Notes</b>	<p>The wetland areas within this site described by Duguid <i>et al.</i> (2005), occur as permanent springs and long-term rockholes situated in gullies draining the southern side of the George Gill Range. The hydrology of the springs is varied; some springs are semi-permanent in the upland areas and some springs feeding seepages at the base of the range are regarded as permanent (Duguid 2005).</p> <p>The assemblage of aquatic invertebrate fauna in wetlands within this site is distinct from that of the nearest comparable collection of semi-permanent waters in the West MacDonnell Ranges (Davis, 1997), and no fish occur in the wetlands of this site, contributing to their uniqueness (Duguid 2005).</p>
	<b>Rivers</b>	None known
FLORA	<b>Significance Rating</b>	<b>Regional Significance</b>
	<b>Notes</b>	<p><b>Restricted range species:</b> At least 18 species recorded from the site have a restricted range within the NT (<i>Acacia aneura</i> var. <i>Bloods Range</i>, <i>Lachnagrostis filliformis</i>, <i>Baeckea polystemonea</i>, <i>Brachyscome blackii</i>, <i>Eucalyptus gillennii</i>, <i>Gastrolobium brevipes</i>, <i>Hibbertia glaberrima</i>, <i>Histiopteris incisa</i>, <i>Juncus continuus</i>, <i>Juncus</i> sp. <i>MacDonnell Ranges</i>, , <i>Poranthera leiosperma</i>, <i>Poranthera triandra</i>, <i>Rulingia magniflora</i>, <i>Solanum orbiculatum</i> subsp. <i>macrophyllum</i>, <i>Sonchus hydrophilus</i>, <i>Swainsona purpurea</i>, <i>Trachymene gilleniae</i> and <i>Xanthorrhoea thorntonii</i>).</p> <p><b>Relictual species:</b> At least 18 relictual species are known from this site (<i>Baumea arthropphylla</i>, <i>Bulbostylis pyriformis</i>, <i>Cyclosorus interruptus</i>, <i>Eleocharis pusilla</i>, <i>Eragrostis sterilis</i>, <i>Fimbristylis sieberana</i>, <i>Histiopteris incise</i>, <i>Imperata cylindrical</i>, <i>Juncus continuus</i>, <i>Juncus kraussii</i> subsp. <i>australiensis</i>, <i>Lachnagrostis filliformis</i>, <i>Lindsaea ensifolia</i> subsp. <i>ensifolia</i>, <i>Ottelia ovalifolia</i>, <i>Oxalis radicata</i>, <i>Persicaria decipiens</i>, <i>Poranthera triandra</i>, <i>Psilotum nudum</i>, <i>Pteris tremula</i> and <i>Schoenus falcatus</i>).</p> <p>Water Penny <i>Sclerocyphon fuscus</i> is reported from wetlands in the site and this species is believed to be a relict of moister climatic regimes, and is known in Central Australia from only a few locations in the West MacDonnell and George Gill Ranges (Davis 1995).</p>
OTHER ENVIRONMENTAL VALUES		<p>Morton <i>et al.</i> (1995) identify the George Gill Range as an extremely significant refuge for biological diversity in arid and semi-arid Australia.</p> <p>The George Gill Range springs and rockholes are recognised as being significant for biodiversity conservation by Duguid <i>et al.</i> (2005).</p> <p>Watarrka is identified as a Site of Botanical Significance in White <i>et al.</i> (2000).</p> <p>Five migratory species recorded from this site are listed under international conventions or bilateral agreements protecting migratory animals.</p> <p>Watarrka National Park and the George Gill Range are listed on the Register of the National Estate for their natural values (Australian Heritage Council).</p>
	MANAGEMENT ISSUES	

<b>MANAGEMENT INFORMATION</b>	<b>NRM groups</b>	No information located.
	<b>Protected areas</b>	Watarrka National Park (719 km <sup>2</sup> / 36% of site).
	<b>Current management plans</b>	<p><b>Site-specific plans:</b> Buffel grass Management Strategy for Watarrka National Park (Brock and Healey January 2008 - draft).</p> <p><b>National recovery plans for threatened species:</b> Great Desert Skink/Tjakura (McAlpin 2001); Marsupial Moles (Benshemesh 2004); Mala (Langford 1999, and currently being revised); Brush-tailed Mulgara (SA Department of Environment and Heritage in prep.); Black-footed Rock Wallaby (WA Department of Environment and Conservation in prep.).</p> <p><b>Other management plans:</b> 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).</p>
	<b>Monitoring programs and research projects</b>	<p>Implementation of the recovery plan for Marsupial Moles (Threatened Species Unit, NRETAS, Alice Springs). Watarrka National Park is a hub for key elements of this project including assessment of artificial mole holes and trialing of the geophone grid.</p> <p>Management and monitoring of the Mala in the predator proof paddock at Watarrka National Park (Threatened Species Unit, Biodiversity Conservation, and Park Management Division of NRETAS, Alice Springs).</p> <p>Watarrka National park has been mapped and surveyed systematically for flora (Biodiversity Conservation South, NRETAS, Alice Springs).</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>Management recommendations</b>	<p>Investigate potential for inclusion of Watarrka area within the proposed Greater Central Australian National Park (NRETA 2005).</p> <p>Increase fire and weed management effort within the site.</p>	
<b>KEY REFERENCES</b>	<b>Papers and reports</b>	<p>Davis, J. (1997). Conservation of aquatic invertebrate communities in central Australia. <i>Memoirs of the Museum of Victoria</i> 56 (2), 491-503.</p> <p>Scott, B. (1997). Diversity in central Australian land snails (Gastropoda: Pulmonata). <i>Memoirs of the Museum of Victoria</i> 56: 435-439.</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, NT.</p>
	<b>Contributors</b>	<p>Chris Pavey, Biodiversity Conservation, NRETAS, Alice Springs.</p> <p>Chris Brock, Biodiversity Conservation, NRETAS, Alice Springs.</p>



**Kings Creek in the George Gill Range (Photo: Chris Pavey)**