Little Sandy Desert 1 *(LSD1 – Rudall subregion)*

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Subregional description and biodiversity values

Description and area

Sparse shrub-steppe over *Triodia basedowii* on stony hills, with River Gum communities and bunch grasslands on alluvial deposits in and associated with ranges. The climate is Arid with summer rainfall. The Rudall Complex, Throssell Group and Lamil Group of the Patterson Orogen. Proterozoic hill country of Throssell, Mount Sears, Broadhurst and Harbutt Ranges. Includes headwaters and course of Rudall River. Extensive areas of tussock grass are associated with footslopes. River Gum communities along drainage. Extensive *Triodia* hummock grasslands on hills and surrounding plains. The area of the subregion is 1, 078, 070 ha.

Dominant land use

Dominant land uses in the subregion are Conservation (xiii), Unallocated Crown land (xi), (x), Mining leases (vii), and Urban (i) (Parnngurr Aboriginal Community near Cotton Creek in Rudall River National Park) (see Appendix B, key b).

Continental Stress Class

The Continental Stress Class for LSD1 is 6.

Known special values in relation to landscape, ecosystem, species and genetic values

Rare features:

- The upper Rudall River, draining into Lake Dora. One of two arid zone rivers, with near permanent wetlands along its course, flowing from uplands across the desert and into a major salt lake within the Little Sandy Desert (the other is Savory Creek). Only the upper half of the course of the Rudall River is within LSD1.
- Small permanent rockhole wetlands associated with ranges and uplands. Locally significant water sources, with high biological and cultural significance.
- Small artificial surface water sources constructed along the Canning Stock Route (far eastern part of LSD1). Many in disrepair, but there is an active program of refurbishment underway, and many are open again. Sometimes a locally significant source of water.

Refugia:

- The only refuge listed by Morton *et al.* (1995) within LSD1 is the Rudall River. They note that it may provide a seasonal refuge to wildlife.
- The hills of the McKay, Harbutt, Fingoon and Broadhurst Ranges present some areas that are protected from fire.

High Species and Ecosystem Diversity:
There is a high number of arid zone reptiles, particularly skink lizards (genera *Ctenotus* and *Lerista*).

Existing subregional or bioregional plans and/or systematic reviews of biodiversity and threats

In 1975 the Conservation Through Reserves Committee (CTRC) made recommendations for reserves within the Pilbara (System 8), in the 'Red Book' reports of 1976 – 1984. This national park has been reserved as recommended. No other subregional or bioregional planning for biodiversity conservation has been attempted.

Wetlands

Wetlands of National significance (DIWA listings)

Name & Code	Description[1]	Condition[2]	Trend[3]	Reliability[4]	Threatening Processes[5]
Lake Dora – Rudall River, GSD004WA	B2, B8, B1	ii - iii	iii - iv	ii	v (camel), vi (buffel grass)

[1]Appendix B, key d; [2]Appendix C, rank 2; [3]Appendix C, rank 3; [4]Appendix C, rank 1; [5]Appendix B, key e

Wetlands of subregional significance (in addition to the DIWA listed wetlands)

Name	Location	Description[1]	Special Values[2]	Condition[3]	Trend[4]	Reliability[5]	Threatening Processes[6]
Minor rockhole wetlands of various Ranges	Many and various	B17	ii (only fresh water sources for large distances)	ii	ii-iii	ii	v (camel)

[1]Appendix B, key d; [2]Appendix B, key c; [3]Appendix C, rank 2; [4]Appendix C, rank 3; [5]Appendix C, rank 1; [6]Appendix B, key e

Riparian zone vegetation

Name	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
Rudall River	ii (Buffel grass common along Rudall River, and permanent and semi-permanent pools badly affected by camel)	iii	ii	v (camel), vi (buffel grass)

[1]Appendix C, rank 2; [2]Appendix C, rank 3; [3]Appendix C, rank 1; [4]Appendix B, key e

Ecosystems at risk

Threatened ecological communities (TECs)

There are no threatened ecological communities in LSD1.

Other ecosystems at risk

Community	Status	NVIS[1]	Condition[2]	Trend[3]	Reliability[4]	Threatening Processes[5]
Semi-permanent pools along course of Rudall River.	V	18	ii	iii	ii	v, vi, vii
Minor rockhole wetlands of various Ranges	V	41	ii	iii	ii	v, vii

[1]Appendix B, key f; [2]Appendix C, rank 2; [3]Appendix C, rank 3; [4]Appendix C, rank 1; [5]Appendix B, key e

Species at risk

Fauna

Species	Status	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
SCHEDULE 1; RARE/LIKELY TO BECOME EXTINCT, DIV 1 (MAMMALS)					
Dasycercus hillieri	E	Unknown	iii	ii	v (fox and cat), vii
Notoryctes caurinus	E	ii	iv	ii	v (fox and cat), vii
Dasycercus cristicauda	V	Unknown	vi	ii	v (fox and cat), vii
Macrotis lagotis	V	ii	iv	ii	v (fox and cat), vii
SCHEDULE 1; RARE/LIKELY TO BECOME EXTINCT, DIV 2 (BIRDS)					
Pezoporus occidentalis	CR	Unknown	vi	ii	v (fox and cat), vii
SCHEDULE 1; RARE/LIKELY TO BECOME EXTINCT, DIV 3 (REPTILES)					
Egernia kintorei	V	Unknown	iii	ii	v (fox and cat), vii
SCHEDULE 4; OTHER SPECIALLY PROTECTED FAUNA. DIVISION 2 (BIRDS)					
Aspidites ramsayi	SP	ii	vi	ii	v (fox and cat), vii
OTHER SPECIES AT RISK WITHIN THE SUBREGION					
Ardeotis australis	P4	Unknown	vi	ii	v (fox and cat), vii

[1]Appendix C, rank 2; [2]Appendix C, rank 3; [3]Appendix C, rank 1; [4]Appendix B, key e

Declared rare and priority flora

Species Name	Status	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
PRIORITY 1					
Eremophila tenella ms	1	Unknown	vi	ii	Unknown threatening processes
PRIORITY 2					
Acacia auripila	2	Unknown	vi	ii	Unknown threatening processes
Goodenia hartiana ms	2	Unknown	vi	ii	Unknown threatening processes
Ptilotus mollis	2	Unknown	vi	ii	Unknown threatening processes
Thysanotus solitaster	2	Unknown	vi	ii	Unknown threatening processes

[1]Appendix C, rank 2; [2]Appendix C, rank 3; [3]Appendix C, rank 1; [4]Appendix B, key e

Analysis of appropriate management scenarios

Reservation priorities of ecosystems

Beard Veg Code	Ecosystem Description	IUCN I-IV Reserve Ha	Non-IUCN Reserve Ha	CALM-Purchased Lease	Priority
39	Shrublands; mulga scrub				H
98	Hummock grasslands, shrub steppe; kanji over soft spinifex & *T. basedowii*	153,865.9			L
99	Hummock grasslands, shrub steppe; *Acacia coriacea* & hakea over hard spinifex *Triodia basedowii*	154,570.5			L
117	Hummock grasslands, grass steppe; soft spinifex	92,089.8			L
125	Bare areas; salt lakes				H
134	Mosaic: Hummock grasslands, open low tree steppe; desert bloodwood and feathertop spinifex (on) sandhills/Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills				H
136	Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills				M
152	Hummock grasslands, grass steppe; soft & hard spinifex soft spinifex				M
157	Hummock grasslands, grass steppe; hard spinifex *Triodia wiseana*				M
2151	Low woodland; coolibah & paperbark (*Melaleuca* sp.)	1,816.3			H

Subregional constraints in order of priority
(see Appendix B, key g)

Competing land uses: Mainly Aboriginal interests, concerning native title. Reserve acquisition can only proceed under a cooperative management model. There are some issues with mining interests.

Bioregional and subregional priority for reserve consolidation

The Little Sandy Desert is reservation Class 2 (see Appendix D, and Appendix C, rank 4) with 4.58% of area in conservation. There is considerable bias at the subregional level with only 1.4% of LSD2 (however LSD1 has 37.32% of its area) in the reserve system so reservation class 1 is more appropriate here. In LSD1 the priority for reserve consolidation is (ii), indicating that the reserve system is highly biased in terms of CAR criteria at the subregional level and is not comprehensive or representative in terms of ecosystem representation.

Reserve management standard

Part of Rudall River National Park is contained in LSD bioregion. The Reserve Management standard for Rudall River National Park is (i) poor (see Appendix C, rank 5). There is no management plan for the park, no staff permanently on site (though the park is visited on an occasional basis by Karratha staff), despite having high tourist visitation and two Aboriginal communities within the park (Parnngurr and Punmu, between 200-500 people). There are two mining communities relatively close to the park (Nifty and Telfer), and there have been ongoing feral animal problems with camels and occasionally donkeys. Formal fire management is absent, although Aboriginal people provide a regular burning regime along roads.

Class	Purpose	Name	Category	Reserve Management[1]
A	Conservation of fauna and flora & Recreation	Rudall River National Park	National Park	i

[1]Appendix C, rank 4

Off reserve conservation

Priority species or groups and existing recovery plans

Species	Location	Ecosystem	Threats/Info	Specific Recovery Plan	General Recovery Plan
Dasycercus cristicauda	Status unclear. Historically collected from CSR in sympatry with *Dasycercus hillieri*.	Sandplains and sand dunes	Requires further survey.	Yes - National Threatened Species Recovery team	Action Plan For Australian Marsupials and Monotremes
Dasycercus hillieri	Status unclear. Historically collected from CSR in sympatry with *D. cristicauda*.		Requires further survey.	No	Action Plan For Australian Marsupials and Monotremes
Notoryctes caurinus	Status unclear. Rarely encountered, and little known of biology or conservation status.		Requires further survey.	No	Action Plan For Australian Marsupials and Monotremes
Macrotis lagotis	Locally common, but distribution patchy. Appears to be coping with cats, but foxes may be too much for them.		Requires further survey and monitoring.	Yes - National Threatened Species Recovery team	Action Plan For Australian Marsupials and Monotremes
Pezoporus occidentalis	Until recently presumed extinct. Very rarely encountered, and nothing known of its recent status or biology. No known populations, but rumours of its presence. Requires further survey, and careful investigation of threatening processes.			No	Action Plan For Australian Birds
Egernia kintorei	Poorly known, and apparently declining		Requires further survey.	Yes - National Threatened Species Recovery team	Action Plan For Australian Reptiles
Aspidites ramsayi	Frequently captured by Aboriginal people in this area for food.	Not uncommon in suitable habitat.	No further management required.	No	Action Plan For Australian Reptiles
Ardeotis australis	Episodically very abundant, and commonly seen throughout region		No further management required.	No	Action Plan For Australian Birds
Acacia auripila	No detailed knowledge of biology or requirements documented.		Needs further survey.	No	No
Bulbine pendula	No detailed knowledge of biology or requirements documented.		Needs further survey.	No	No
Daviesia eremaea	No detailed knowledge of biology or requirements documented.		Needs further survey.	No	No
Eremophila tenella ms	No detailed knowledge of biology or requirements documented.		Needs further survey.	No	No
Goodenia hartiana ms	No detailed knowledge of biology or requirements documented.		Needs further survey.	No	No
Goodenia purpurascens	No detailed knowledge of biology or requirements documented.		Needs further survey.	No	No
Goodenia schwerinensis	No detailed knowledge of biology or requirements documented.		Needs further survey.	No	No
Species	Location	Ecosystem	Threats/Info	Specific Recovery Plan	General Recovery Plan
Ptilotus aphyllus	No detailed knowledge of biology or requirements documented.		Needs further survey.	No	No
Ptilotus mollis	No detailed knowledge of biology or requirements documented.		Needs further survey.	No	No
Thysanotus solitaster	No detailed knowledge of biology or requirements documented.		Needs further survey.	No	No

Appropriate species recovery actions

Species/System	Recovery Actions[1]	Recovery Descriptions
Dasycercus cristicauda	xiv	Low level of knowledge.
Dasycercus hillieri	xii, xiv	Low level of knowledge. Less well known that *D. cristicauda.*
Notoryctes caurinus	xii, xiv	Low level of knowledge.
Macrotis lagotis	xiv	Definition of areas inhabited, and monitoring of some populations
Pezoporus occidentalis	xii, xiv	Locate and protect any existing populations
Egernia kintorei	xii, xiv	Low level of knowledge.
Aspidites ramsayi	xii	Appears secure
Ardeotis australis	none	Appears secure
Polytelis alexandrae	xii, xiv	Low level of knowledge.

Acacia auripila	xii, xiv	Poor knowledge
Bulbine pendula	xii, xiv	Poor knowledge
Daviesia eremaea	xii, xiv	Poor knowledge
Eremophila tenella ms	xii, xiv	Poor knowledge
Goodenia hartiana ms	xii, xiv	Poor knowledge
Goodenia purpurascens	xii, xiv	Poor knowledge
Goodenia schwerinensis	xii, xiv	Poor knowledge
Ptilotus aphyllus	xii, xiv	Poor knowledge
Ptilotus mollis	xii, xiv	Poor knowledge
Sauropus arenosus	xii, xiv	Poor knowledge
Thysanotus solitaster	xii, xiv	Poor knowledge

[1]Appendix B, key h.

Ecosystems and appropriate recovery actions

Beard Veg Assoc	Ecosystem	Recovery Actions[1]	Recovery Descriptions	Constraints
125	Bare areas; salt lakes	ix, xii, vii, i, iii	Fire management, research, feral animal control, habitat retention on reserves and protection on other state lands.	Insufficient resources to implement management activities.
134	Mosaic: Hummock grasslands, open low tree steppe; desert bloodwood and feathertop spinifex (on) sandhills/Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills	ix, xii, vii, i, iii	Fire management, research, feral animal control, habitat retention on reserves and protection on other state lands.	Insufficient resources to implement management activities.

[1]Appendix B, rank h.

Existing ecosystem recovery plans

There are no recovery plans for ecosystems at risk in LSD1.

Subregion priority for off reserve conservation

The subregional priority for off park conservation in LSD1 is (iii) (see Appendix C, rank 6), indicating that a range of off park measures is required.

Conservation actions as an integral part of NRM

Existing NRM actions

At present there is almost nothing being done in terms of NRM, except some very limited threat abatement planning (pest management). Industry codes of practice have been useful in getting mineral explorers to undertake biological work.

Feasible opportunities for NRM

Threat Abatement Planning: Further implementation of pest management strategies.

Industry Codes of Practice: Continue to work via industry codes of practice with mineral explorers.

Capability Building: In place through Aboriginal communities.

Impediments or constraints to opportunities

Recognition of Native Title will require cooperative work with desert Aboriginal communities. In some cases, this will mean a big change in the way we do business with traditional owners. However, opportunities could be significant, due to the close proximity of large communities (Parnngurr and Punmu). Mineral tenements may be an obstacle.

Subregions where specific NRM actions are a priority to pursue

LSD1 has an NRM priority of (ii) (see Appendix C, rank 7) indicating that there are significant constraints to integrate conservation as part of a production / development system. Mainly applies to acquisition of reserves under Native Title, and lack of control of feral herbivores.

Data gaps

Gaps in data needed for the identification of biodiversity values and management responses

Vegetation and Ecosystem Mapping: No environmental geology / regolith mapping is available at better than 1:250 000. No broad-scale soil mapping is available at finer scale than 1:2 000 000 (Bettenay *et al.* 1967).

Quantitative Fauna Survey: Quantitative subregional survey of fauna has not been undertaken.

Floristic Data: Subregional flora is poorly known, with few intensive studies. Only small areas have been examined in detail by botanists, associated with mining exploration. Quadrat-based floristic data is available from few if any localities.

Ecological and Life History: There are few detailed data on ecological requirements and life histories of virtually all invertebrate species, plants, persisting CWR mammals, uncommon vertebrate and plant species, and ecologically dominant plant species (e.g. hummock grasses). There are little data to provide a regional context on population-trends for even ecologically significant species. (e.g., native rodents, dasyurids, spinifex reptile communities, termites, ants, weeds such as buffel grass).

Other Priority Data Gaps Include:

- No data on the fauna / flora of small permanent rockhole wetlands associated within LSD1.
- Little data on aquatic environments of the Rudall River.
- No quantitative data on the impact of exotic herbivores on aquatic systems, or other communities, especially effects on invertebrate and non-vascular plant communities.
- No data on the impact of camel on desert environments, particularly on water sources, and upon the fauna which are dependant upon such water sources.
- No quantitative data on the impact of changes to fire regimes in hummock grasslands, particularly upon vertebrate communities, invertebrate communities, and non-vascular plants.

Sources

References cited

No.	Author	Date	Title	Publication Details	Pub. Type
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181	Cogger, H., Cameron, E., Sadlier, R. and Eggler, P.	(1993).	The Action Plan for Australian Reptiles.	Australian Nature Conservation Agency, Canberra.	R
298	Garnett, S.T. and Crowley, G.M.	(2000).	The Action Plan for Australian Birds.	Environment Australia, Canberra.	R
483	Maxwell, S., Burbidge, A.A. and Morris, K. (eds).	(1996).	The 1996 Action Plan for Australian Marsupials and Monotremes. Wildlife Australia Endangered Species Program Project Number 50.	Environment Australia, Canberra.	R
519	Morton S.R., Short, J. and Barker, R.D. with an Appendix by Griffin, G.F. and Pearce, G.	(1995).	Refugia for Biological Diversity in Arid and Semi Arid Australia. Biodiversity Series, Paper No 4. Biodiversity Unit.	Department of Environment Sport and Territories. Canberra	R

R = Report; J = Journal article; O = Other.

Other relevant publications

See reference numbers 026, 086, 091, 094, 118, 120, 181, 182, 210, 258, 266, 281, 298, 345, 346, 383, 387, 407, 419, 473, 474, 475, 483, 493, 519, 625, 634, 635, 636, 637, 638, 647, 648 and 699 in Appendix A.