Gibson Desert 1 *(GD1 - Lateritic Plain subregion)*

DARREN GRAHAM, BRAD BARTON AND MARK COWAN
SEPTEMBER 2001

Subregional description and biodiversity values

Description and area

Monotonous, gently undulating plain with few sandstone mesas. Solitic gravelly sandplains and laterised upland on flat-lying Jurassic and Cretaceous sandstones of Canning (Gunbarrel) Basin. Vegetation described as 'Carnegie Botanical District', Mulga parkland over *Triodia basedowii* on lateritic "buckshot" plains. Mixed shrub steppe of Acacia, Hakea and Grevillea over *Triodia pungens* on red sand plains and dune fields. Lateritic uplands support shrub steppe in the north and mulga scrub in the south. Quaternary alluvia associated with palaeo-drainage features support Coolibah woodlands over bunch grasses. Climate is Arid, mean annual rainfall 200mm of mainly summer rainfall. Subregional area is 14, 038, 333ha.

Dominant land use
(see Appendix B, key b)

Description	Percentage of Subregion
Aboriginal Reserve	5.43%
Conservation Reserves	14.57%
Grazing - Leasehold	29.26%
Unallocated Crown Land and Crown Reserves	50.74%

Continental Stress Class

The Continental Stress Class for GD1 is 6.

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

Rare features:

- Lake Gruszka: is a large (500ha) seasonal / intermittent freshwater wooded lake, and as such plays an important ecological role, and is of historical and cultural significance. It is also listed in the directory of important wetlands of Australia, (WA039).
- Gibson Desert Gnamma Holes: are a series of 'rock pools', in the vicinity of the 'Patjarr' community. They may play an important ecological role, and are of historical and cultural significance. They are also listed in the directory of important wetland of Australia, (WA038).

Declared Rare and Priority Flora:
Include: *Abutilon* sp. Warburton, *Acacia balsamea, Calandrinia porifera, Calytrix warburtonensis, Dampiera atriplicina, Eremophila pallida ms, Eremophila revoluta ms, Eremophila viscimarginata ms, Melaleuca apostiba, Neurachne lanigera, Philotheca eremicola.*

Rare and specially Protected Fauna:
Including: Major Mitchell`s Cockatoo (*Cacatua leadbeateri*), Princess Parrot (*Polytelis alexandrae*), Scarlet-chested Parrot (*Neophema splendida*), Slender-billed Thornbill (*Acanthiza iredalei iredalei*), Malleefowl (*Leipoa ocellata*), Night Parrot (*Pezoporus occidentalis*), Bilby (*Macrotis lagotis*), Southern Marsupial Mole (*Notoryctes typhlops*), Mulgara (*Dasycercus cristicauda*), Black-footed Rock-wallaby (*Petrogale lateralis*), Long-tailed Dunnart (*Sminthopsis longicauda*), Great Desert Skink (*Egernia kintorei*), and Woma (*Aspidites ramsayi*).

Ecosystem Types Which Have More Than 90% of Their Total Extent Within GD1

Bear Veg Assoc	Description
102	Hummock grasslands, shrub steppe; *Acacia pachycarpa* over *Triodia basedowii*
185	Sedgeland; sedges with medium woodland; sedges with coolibah over various sedges
139	Hummock grasslands, patchy shrub steppe; mulga over hard spinifex on laterite

Refugia:
There are no known true refugia in GD 1, however the 'Gibson Desert Gnamma Holes', Lake Gruszka, Lake Blair, Boyd Lagoon, The Lake Breaden System, Lake Cohen, Lake Hancock and the West Clutterbuck Hills Creek System have the potential to act as refugia during periods of drought, or as breeding locations.

Species and Ecosystem Diversity:
The Central Australian Deserts (of which the Gibson Desert is a part) are known to exhibit particularly high reptile species richness.

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

In 1974 the Conservation Through Reserves Committee (CTRC) made recommendations for reserves within the Deserts and Nullarbor Plain (System 12) in the CTRC Green Book. The CTRC status report (Red Book 1993) noted that recommendations for reservation by the CTRC in GD1 (Gibson Desert Nature Reserve, Mangkili Claypan Nature Reserve) were implemented. Baker Lake recommendation was deemed no longer appropriate as the area was now included within an aboriginal reserve.
Most of the GD1 subregion is covered by a CALM Regional Management Plan, published in 1994, that provides an overview of the region's biota, addresses land and wildlife conservation issues, but was written to cover a third of WA and therefore was generalised in its attention to detail. The reviews and strategies therein (for reserve system development or management of weeds, fire, feral animals, mining, ecosystem rehabilitation & disease quarantine) do not address the specific needs of subregions, or even bioregions, individually.

Part of this subregion incorporates the Gibson Desert Nature Reserve (34606). A management plan for this area is currently in preparation requiring further consultation with Native Title holders and other stakeholders.

Wetlands

Wetlands of National Significance (DIWA listings)

Name and Code	Description[1]	Special Values[2]	Condition[3]	Trend[4]	Reliability[5]	Threatening Processes[6]
Gibson Desert Gnamma Holes (WA038)	B17	i, cultural values	iii	iii-iv	ii-iii	xii (siltation is a major problem as many of the sites are no longer regularly maintained by traditional owners), v (camels, foxes and cats)
Lake Gruszka (WA039)	B6, B14	i, cultural values	iv	iv	ii	vii (altered fire regimes in fringing flora), v (foxes and cats), iv (camels, goats and rabbits)

[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

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]
Lake Blair	761932E 7265099N	B6	i, iii, cultural values	iv	iv	i	vii, v (camels, rabbits, foxes and cats)
West Clutterbuck Hills Creek System	829696E 7277216N	B2	i, iii, cultural values	iv	iv	i	vii, v (camels, rabbits, foxes and cats)
Boyd Lagoon	735000E 7127000N	B6	i, iii	iv	iv	i	vii, v (camels, rabbits, foxes and cats)
Lake Breaden System	763000E 7146000N	B6	i, iii	iv	iv	i	vii, v (camels, rabbits, foxes and cats)
Lake Cohen	706000E 7296000N	B6	i, iii	iv	iv	i	vii, v (camels, rabbits, foxes and cats)
Lake Hancock	688000E 7277000N	B6	i, iii	iv	iv	i	vii, v (camels, rabbits, foxes and cats)

Riparian zone vegetation

Name	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
Ephemeral creek line vegetation	iii	iv	i-ii	iv (camels and rabbits), vii, v (cats and foxes), 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 (TECs) in GD1.

Other ecosystems at risk

Community	Status	NVIS[1]	Condition[2]	Trend[3]	Reliability[4]	Threatening Processes[5]
Hummock grasslands, shrub steppe; *Acacia pachycarpa* over *Triodia basedowii*	V	23	iii	iv	iii	iv, v (camels, rabbits), vii
Gorge communities - desert ranges (D. Pearson pers. comm.)	V	43	iii	iv	ii	iv, vii
Wooded coolibah freshwater wetland of Lake Gruszka (D. Pearson pers. comm..)	V	42	iii	iv	ii	iv, v, (camels), 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)					
Notoryctes typhlops	E	ii	iii	ii	vii
Dasycercus cristicauda	V	ii	iii	ii	v (foxes, cats), vii
Macrotis lagotis	V	ii	iii	i-ii	v (foxes, cats)
Petrogale lateralis	V	i	ii	iii	v (foxes, cats), vii
SCHEDULE 1; RARE/LIKELY TO BECOME EXTINCT, DIV 2 (BIRDS)					
Pezoporus occidentalis	CR	i	i	ii	v (foxes, cats)
Leipoa ocellata	V	i	vi	ii	v (foxes, cats), vii
Polytelis alexandrae	V	ii	vi	ii	vii
SCHEDULE 1; RARE/LIKELY TO BECOME EXTINCT, DIV 3 (REPTILES)					
Egernia kintorei	V	i	iii	ii	vii
SCHEDULE 4; OTHER SPECIALLY PROTECTED FAUNA. DIVISION 2 (BIRDS)					
Cacatua leadbeateri	SP	ii	iii-iv	ii	ii, vii
Acanthiza iredalei iredalei		ii	vi	ii	vii
SCHEDULE 4; OTHER SPECIALLY PROTECTED FAUNA. DIVISION 3 (REPTILES)					
Aspidites ramsayi	SP	i	iii	ii	iv, vii
OTHER SPECIES AT RISK WITHIN THE SUBREGION					
Neophema splendida	P4	unknown	vi	ii	ii
Sminthopsis longicauda	P4	ii	vi	ii	v (foxes, cats), 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					
Abutilon sp. Warburton	1	unknown	vi	ii	vii
Eremophila viscimarginata ms	1	unknown	vi	ii	vii
Melaleuca apostiba	1	unknown	vi	ii	vi, vii
Neurachne lanigera	1	unknown	vi	ii	vii
Philotheca eremicola	1	unknown	vi	ii	vii
PRIORITY 2					
Calytrix warburtonensis	2	unknown	vi	ii	vii
Species Name	Status	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
Dampiera atriplicina	2	unknown	vi	ii	vii
Eremophila pallida ms	2	unknown	vi	ii	vii
Eremophila revoluta ms	2	unknown	vi	ii	vii

[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 Assoc	Ecosystem Description	IUCN I-IV	Non-IUCN Reserve	CALM-Purchased Lease	Priority
18	Low woodland; mulga (*Acacia aneura*)	X			L
19	Low woodland; mulga between sandridges				M
39	Shrublands; mulga scrub	X			L
40	Shrublands; acacia scrub, various species	X			L
45	Shrublands; mallee scrub (Great Victoria Desert)				L
95	Hummock grasslands, shrub steppe; acacia & grevillea over *Triodia basedowii*	X			L
96	Hummock grasslands, shrub steppe; acacia species (+grevillea) over *Triodia basedowii* often between sandridges	X			M
102	Hummock grasslands, shrub steppe; *Acacia pachycarpa* over *Triodia*				H

	basedowii				
125	Bare areas; salt lakes	X			L
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	X			L
136	Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills				H
139	Hummock grasslands, patchy shrub steppe; mulga over hard spinifex on laterite	X			L
151	Sedgeland; sedges with open low trees; coolibah over various sedges				L
185	Sedgeland; sedges with medium woodland; sedges with coolibah over various sedges	X			L
217	Hummock grasslands, steppe woodland; desert oak (*Allocasuarina decaisneana*) & soft spinifex (soft spinifex)				L
230	Mosaic: Medium sparse woodland; desert oak between sand dunes/Hummock grasslands, grass steppe; hard spinifex *Triodia basedowii*	X			L
236	Hummock grasslands, shrub steppe; mulga and mallee (marble gum) over hard spinifex				L
239	Hummock grasslands, open medium tree & mallee steppe; marble gum (*E. gonglocarpa* & mallee (*Eucalyptus youngiana*) over hard spinifex *Triodia basedowii* between sandhills				L
252	Hummock grasslands, shrub steppe; mulga and mallee over soft spinifex				L
676	Succulent steppe; samphire	X			L
1217	Hummock grasslands, steppe woodland; desert oak & soft spinifex between sandhills				H
2041	Succulent steppe with scrub; teatree over saltflats				L
	Gorge communities - desert ranges (D. Pearson pers. comm.)	X			M
	Wooded coolibah freshwater wetland of Lake Gruszka. Most wetlands in that area are saline (D. Pearson pers. comm.).	X			L

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

Economic: In terms of resources to secure and adequately manage reserves

Competing Landuses: Mining interests may have some influence on CTR establishment.

Bioregional and subregional priority for reserve consolidation

Overall 12% of Gibson Desert bioregion is reserved in IUCN I-IV reserves and is classified as IBRA reservation class 4 (see Appendix D, and Appendix C, rank 4). GD1 has 14.7% and GD2 has 0% reserved in IUCN I-IV reserves and therefore, at the subregional scale GD1 should also remain with IBRA reservation Class 4

Reserve management standard

The overall ranking for GD1 is (ii) Fair (see Appendix C, rank 5), i.e. biodiversity values and/or management issues poorly identified; some resource degradation is occurring though retrievable. Wildfire management is non–existent. Mining exploration activities are supervised. The impact of feral herbivores is likely to be considerable although not quantified, and there are no feral predator control programs in the subregion.

Class	Purpose	Name	Category	Reserve Management[1]
A	Conservation of flora and fauna	Gibson Desert Nature Reserve	Nature Reserve	ii-iii
A	Conservation of flora and fauna	Mangkili Claypan Nature Reserve	Nature Reserve	ii-iii

[1]Appendix C, rank 5

Off reserve conservation

Priority species or groups

Species	Threatening Processes[1]	Specific Recovery Plan	General Recovery Plan
Cacatua leadbeateri	vii	No	Action Plan for Australian Birds
Polytelis alexandrae	v (foxes and cats), vii	No	Action Plan for Australian Birds
Neophema splendida	v (foxes and cats), iv (feral herbivores), vii	No	Action Plan for Australian Birds
Acanthiza iredalei iredalei	v (foxes and cats), vii	No	Action Plan for Australian Birds
Leipoa ocellata	v (foxes and cats), iv (feral herbivores), vii	No CALM Recovery Plan, however Malleefowl Preservation Society has current Action Plan and ongoing research	Action Plan for Australian Birds
Pezoporus occidentalis	v (foxes and cats), vii	Yes - IRP	Action Plan for Australian Birds
Macrotis lagotis	v (foxes and cats), iv (rabbits), vii	Yes – National Threatened Species Recovery team	Action Plan for Australian Marsupials and Monotremes
Notoryctes typhlops	v (foxes and cats), vii	No	Action Plan for Australian Marsupials and Monotremes
Dasycercus cristicauda	v (foxes and cats), iv (feral herbivores), vii	Yes - National Threatened Species Recovery team	Action Plan for Australian Marsupials and Monotremes
Sminthopsis longicauda	v (foxes and cats), iv (feral herbivores), vii	No	Action Plan for Australian Marsupials and Monotremes
Petrogale lateralis	v (foxes and cats)	No	Action Plan for Australian Marsupials and Monotremes
Egernia kintorei	v (foxes and cats), vii	Yes - National Threatened Species Recovery team	Action Plan for Australian Reptiles
Aspidites ramsayi	v (foxes and cats), vii	No	Action Plan for Australian Reptiles

[1]Appendix B, key e

Appropriate recovery actions

Species	Recovery Actions[1]	Recovery Descriptions	Constraints
Cacatua leadbeateri	i, ii, iii, ix	Habitat retention through reserves or on other State lands or on private lands.	Insufficient resources to implement management activities.
Polytelis alexandrae	i, ii, iii, ix	Habitat retention through reserves or on other State lands or on private lands	Insufficient resources to implement management activities.
Neophema splendida	i, ii, iii, ix	Habitat retention through reserves or on other State lands or on private lands	Insufficient resources to implement management activities.
Acanthiza iredalei iredalei	i, ii, iii, ix	Habitat retention through reserves or on other State lands or on private lands	Insufficient resources to implement management activities.
Leipoa ocellata	i, ii, iii, vii, ix	Habitat retention through reserves or on other State lands or on private lands, feral predator control.	Insufficient resources to implement management activities.
Pezoporus occidentalis	i, ii, iii, vii, ix	Habitat retention through reserves or on other State lands or on private lands, feral predator control.	Insufficient resources to implement management activities.
Macrotis lagotis	i, ii, iii, vii, x, ix	Habitat retention through reserves or on other State lands or on private lands, feral predator control. Translocation from secure populations	Insufficient resources to implement management activities.
Notoryctes typhlops	i, ii, iii, vii, ix	Habitat retention through reserves or on other State lands or on private lands, feral predator control.	Insufficient resources to implement management activities.
Dasycercus cristicauda	i, ii, iii, vii, ix	Habitat retention through reserves or on other State lands or on private lands, feral predator control.	Insufficient resources to implement management activities.
Sminthopsis longicauda	i, ii, iii, vii, ix	Habitat retention through reserves or on other State lands or on private lands, feral predator control.	Insufficient resources to implement management activities.
Petrogale lateralis	i, ii, iii, vii, x, ix	Habitat retention through reserves or on other State lands or on private lands, feral predator control. Translocation from secure populations	Insufficient resources to implement management activities.
Egernia kintorei	i, ii, iii, vii, ix	Habitat retention through reserves or on other State lands or on private lands, feral predator control.	Insufficient resources to implement management activities.
Aspidites ramsayi	i, ii, iii, vii, ix	Habitat retention through reserves or on other State lands or on private lands, feral predator control.	Insufficient resources to implement management activities.

[1]Appendix B, rank i.

Existing species recovery plans

A recovery plan for *Egernia kintorei* 2001 – 2011 is in place with a National Recovery team established. *Dasycercus cristicauda* is a species monitored by the National Threatened Species Recovery team. Most species are included in National Action Plans including The Action Plan for Australian Birds, 2000, The Action Plan for Australian Reptiles, 1996 Action Plan for Australian Marsupials and Monotremes.

Ecosystems, existing recovery plans and appropriate recovery actions

All ecosystems at risk in GD1 are currently held on reserve, so no off-park conservation actions are applicable. However, a number of recovery actions generally apply to improving ecosystem health in the subregion, including fire management, research and feral animal control.

Subregion priority for off reserve conservation

The off-reserve conservation priority is (ii – iii) (see Appendix C, rank 6) indicating that there are a range of off-park measures required, limited resources, and there is capacity for community involvement to achieve this. There are no major conflicting land uses as much of GD1 is Unoccupied Crown Land, Aboriginal Reserve or Conservation Reserve. Mineral exploration and possible mine establishment are considered the main conflicting land use. Grazing leases (30%) of subregion are not currently in operation.

Conservation actions as an integral part of NRM

Existing NRM actions

Industry Codes of Practice: Pertaining to mining and exploration.

Feasible opportunities for NRM

Legislation: Including duty of care for leasehold and other lands

Threat Abatement Planning: Vegetation and threatened species management plans, pest management, and fire management plans.

Capacity Building: Particularly developing relationships with Aboriginal communities.

Impediments or constraints to opportunities

A number of impediments exist including the Land Administration Act and the operations of the Pastoral Land Board although this only impacts on a small portion of GVD1 (western margin). CTR could be limited through mining leases and tenements although not currently a major factor. There is a need to increase awareness of conservation values through education of various industries (particularly mining) and the public in general. Limited financial resources are also a major constraint. Developing association with Aboriginal communities is essential.

Subregions where specific NRM actions are a priority to pursue

GD1 has an NRM rank of (iv) (see Appendix C, rank 7), indicating that NRM instruments are in place with some achieved biodiversity outcomes.

Data gaps

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

Vegetation and Regional Ecosystem Mapping: There has been no complete and systematic bioregional survey of flora or fauna.

Systematic Fauna Survey: Data is confined to vertebrates and is sparse. Burrows, Christensen, Ward and Liddelow's (unpublished CALM data) work in the Young Ranges looked at fauna across the landscape 1988 – 1991 (ranges to sand dunes). They also developed a long term (10 years) study site at Eagle bore in the Gibson Desert Nature Reserve researching and monitoring fire ecology, fauna and feral predator control in the arid zone. CWR mammal re-introductions (8 monitoring sites, 50 pit traps at each site) have been trialed. Other fauna surveys conducted have been one off samplings or opportunistic collections.

Floristic Data: Vegetation mapping by Beard has been produced at the 1:1000000 scale. Burrows, Christensen, Ward and Liddelow's work at Eagle bore in the Gibson Desert Nature Reserve is restricted to 12 sites (50m x 50m) studying fire and vegetation regeneration post fire. Other sampling has been opportunistic and generally confined to access routes.

Ecological and Life History Data: There is little data on habitat requirements of virtually all invertebrate species, most ephemeral plants, persisting CRW mammals, and uncommon vertebrate and plant species.

Other Priority Data Gaps Include:

- No quantitative data present on the effect of exotic predators / herbivores, weed invasion, fire, mineral extraction or other threatening processes

Sources

Other relevant publications

See reference numbers 053, 054, 063, 075, 081, 090, 091, 098, 099, 101, 104, 105, 115, 116, 118, 119, 131, 140, 141, 170, 181, 211, 231, 232, 241, 258, 268, 272, 278, 298, 313, 321, 370, 420, 459, 483, 484, 486, 490, 497, 519, 526, 545, 546, 548, 584, 607, 627, 628, 638, 685, and 686 in Appendix A.