Great Sandy Desert 2 *(GSD2 – Mackay subregion)*

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Information from Western Australia and the Northern Territory has been listed separately in this synopsis as a result of the different vegetation mapping protocols that have been used in the two jurisdictions and the associated difficulties in combining that information.

Subregional description and biodiversity values

Description and area

Western Australia:
Tropical inland 'red-centre' desert. Includes 'Percival' and 'Auld' palaeoriver systems. Mainly tree steppe grading to shrub steppe in south; comprising open hummock grassland of *Triodia pungens* and *Triodia schinzii* with scattered trees of *Owenia reticulata* and bloodwood (*Corymbia* spp.), and shrubs of *Acacia* spp., *Grevillea wickhamii* and *G. refracta*, on Quaternary red longitudinal sand dune fields overlying Jurassic and Cretaceous sandstones of the Canning and Armadeus Basins. *Casuarina decaisneana* (Desert Oak) occurs in the south and east of the region. Gently undulating lateritised uplands support shrub steppe such as *Acacia pachycarpa* shrublands over *Triodia pungens* hummock grass. Calcrete and evaporite surfaces are associated with occluded palaeo-drainage systems that traverse the desert; these include extensive salt lake chains with samphire low shrublands, and *Melaleuca glomerata - M. lasiandra* shrublands. Monsoonal influences are apparent in the north-western sector of this region. The climate is arid tropical with summer rainfall. Subregional area is 18, 636, 695 ha.

Northern Territory:
The Mackay subregion forms a large area south of the Tanami Desert and west of the MacDonnell Ranges. The major geological units are the Arunta Inlier and the Amadeus and Ngalia Basins. It is made up of a complex of sedimentary and metamorphic rocks of various ages. Soils are predominantly shallow sands. The climate is arid with annual average rainfall varying between 300 to 400 mm, and there are temperature extremes between summer and winter. Elevation varies between 350 and 800 m. Vegetation is dominated by hummock grassland (*Triodia basedowii* and *T. pungens*) with areas of tall-shrubland (*Acacia* spp.) or low open woodland (*Allocasuarina decaisneana*). There is little drainage in the subregion, although a large playa lake, Lake Mackay, occurs on the Western Australia border.

Dominant land use

Western Australia:
Unallocated Crown land (xi) (see Appendix B, key b), Conservation (xiii), Aboriginal lands and Reserves (x), Mining leases (vii), and small areas of Urban (i).

Northern Territory:
No information supplied.

Continental Stress Class

The Continental Stress Class for both the West Australian and Northern Territory components of GSD2 is 5.

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

Western Australia:
Rudall River Draining into Lake Dora: The only example of an arid zone river, with near permanent wetlands along its course, flowing from uplands across the desert and into a major salt lake within the Great Sandy Desert. Note that only the lower half of the course of the Rudall River is within GSD2.

Wetlands: Small permanent wetlands associated with palaeo-drainage lines, now occupied by salt lakes. These small fresh-water springs and seepages are locally significant water sources, and have high biological and cultural significance. E.g. Percival Lakes, Lake Dora, Joanna Spring.

Rockpools: Small permanent rockhole wetlands associated with ranges and uplands. These are locally significant water sources, and are of high biological and cultural significance.

Small Artificial Surface Water Sources Constructed Along the Canning Stock Route: Many in disrepair, but there is an active program of refurbishment underway, and many are open again. Sometimes locally significant sources of water.

Centres of Endemism:
Possibility of high endemism within troglobitic faunas associated with calcrete systems along palaeo-drainage lines. So far not investigated, but likelihood of unique faunas very high.

Refugia:
The only refugia listed by Morton *et al.* (1995) within GSD2 is the Rudall River. They note that it may provide a seasonal refuge to wildlife.

High Species or Ecosystem Diversity:
High numbers of arid zone reptiles, particularly skink lizards (genera *Ctenotus* and *Lerista*).

Northern Territory:

Refugia:

Uluru and Kata Tjuta provide moist habitats for rare, relict, and unusual species. George Gill Ranges provide moist gorges and habitat for rare and relict species (Morton *et al.* 1995). DIWA-listed Lake Amadeus important ecological refuge providing complex mixture of habitats with dependable supplies of moisture.

Wetlands:

Lake Amadeus and Lake MacDonald.

Existing Subregional or Bioregional Plans and/or Systematic Reviews of Biodiversity and Threats

Western Australia:

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 (Environmental Protection Authority 1993). Reserve recommendations GSD2 included the Anketell Ridge Nature Reserve (part), Rudall River National Park (part), Percival Lakes Nature Reserve, Lake Auld Nature Reserve and Southesk Tablelands National Park. In 1993, the 'Red Book Status Report' reviewed the implementation of these recommendations (Environmental Protection Authority 1993). Most recommendations had not progressed beyond initial survey and definition of proposed boundaries. Only the Rudall River National Park has proceeded to reservation. No other subregional or bioregional planning for biodiversity conservation has been attempted.

Northern Territory:

There are no plans for the subregion, other than a Management Plan for single reserve (Uluru).

Wetlands

Wetlands of National significance (DIWA listings)

Western Australia:

Name & Code	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
Lake Dora – Rudall River, GSD004WA	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

Northern Territory:

Name & Code	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
Lake Armadeus – NT005	iii	vi	Unknown	v (Camels on salt lake margins; rabbits), vi (buffel grass, couch). Note: Lake occurs mostly in GSD4 subregion.

[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)

Western Australia:

Name	Location	Description[1]	Special Values[2]	Condition[3]	Trend[4]	Reliability[5]	Threatening Processes[6]
Minor spring wetlands of Percival Lakes	Several, along lake chain	B17	ii (only fresh water sources for large distances).	ii	ii-iii	ii	v (camel)
Minor spring wetlands of other lake systems	Not known in detail	B17	ii (only fresh water sources for large distances)	ii	ii-iii	ii	v (camel)
Soaks excavated by Aboriginal people, now no longer maintained	Many and scattered.	B17	ii (only fresh water sources for large distances)	ii	ii		v (camel), xii (lack of maintenance resulting in burial of water).

Name	Location	Description[1]	Special Values[2]	Condition[3]	Trend[4]	Reliability[5]	Threatening Processes[6]
Salt lakes throughout region	Various	B8	iii (saltlake fauna including small crustaceans, supporting wading birds in season).	iv	iv	ii	Unknown threatening processes
Underground waters, associated with calcrete deposits along palaeo-drainage lines	Various	N/A	Possibly stygofauna – some stygofauna known from vicinity of CSR.	iv	vi	ii	Unknown threatening processes

[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

Northern Territory:

Name	Location	Description[1]	Special Values[2]	Condition[3]	Trend[4]	Reliability[5]	Threatening Processes[6]
Lake MacDonald	Not stated	B8	iii (important aggregation site for poorly known wetland birds).	iii	vi	Unknown	Not stated
Lake MacKay and adjacent swamps and pans	Not stated	B8	iii (Australia's fourth largest lake. Supports significant populations of water birds).	iii	vi	Unknown	Not stated

[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

Western Australia:

Name	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
Rudall River	ii	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

Northern Territory:

Name	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
Ephemeral creek lines	iii	iii	Unknown	vii, vi, v

[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)

Western Australia:
There are no Threatened Ecological Communities (TECs) in GSD2.

Northern Territory:
No information supplied.

Other ecosystems at risk

Western Australia:

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	iii	ii	v, vi
Small spring wetlands, Percival Lakes	V	38	ii	iii	ii	v
Any other permanent or semi-permanent wetlands within the sub-bioregion	V	38	ii	iii	ii	v

[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

Northern Territory:
No information supplied.

Species at risk

Fauna

Western Australia:

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

Northern Territory:

Species	Status	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
Dasycercus cristicauda	V	ii	iii	Not stated	v (cats), iv (degradation of preferred habitat through grazing by camels), vii (loss of preferred habitat through recent change in scale and timing of fire)
Lagorchestes hirsutus	EX	i	i	Not stated	v, vii
Notoryctes typhlops	V	ii	iii	Not stated	v (cats and foxes), vii (possible impacts of increased incidence of extensive hot fire rather than fine-scale cooler burns)
Petrogale lateralis MacDonnell Ranges race	V	ii	iii	Not stated	vii (increased incidence of extensive hot fire), vi (broad-scale invasion of weeds), v (foxes and cats), iv (livestock, donkeys and camels).
Sminthopsis psammophila	E	ii	iii	Not stated	Little information but possibly v (cats and foxes) and vii (reduction in habitat quality because of increased incidence of extensive hot fire)

Species	Status	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
Trichosurus vulpecula	E	ii	ii	Not stated	iv (camels and donkeys), v (foxes and cats), vi (broad-scale weed invasion), vii (increased incidence of hot extensive fires)
Pezoporus occidentalis	E	i	vi	Not stated	iv (stock, rabbits and camels), vii (degradation of habitat), v (foxes and cats)
Polytelis alexandrae	V	iii	iii	Not stated	vii (increased incidence of extensive hot fires, possibly at expense of fine-scale cooler fires), v (rabbits, camels and donkeys), iv ((possibly) reduction in habitat quality through vegetation change associated with pastoralism)
Stictonetta naevosa	V	iii	iv	Not stated	x (national scale alteration of wetland habitat suitability for this nomadic species)
Egernia kintorei	V	ii	iii	Not stated	vii (alteration of scale, timing and frequency of fire), iv (livestock, donkeys and camels), v (foxes and cats)

[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

Western Australia:

Species Name	Status	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
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	Unknown	Unknown threatening processes

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

Northern Territory:
No information supplied.

Analysis of appropriate management scenarios

Reservation priorities of ecosystems

Western Australia:

Beard Veg Assoc	Ecosystem Description	IUCN I-IV (hectares)	Non-IUCN Reserve	CALM Purchased Lease	Priority
39	Shrublands; mulga scrub				H
41	Shrublands; teatree scrub	12,550.8			M
99	Hummock grasslands, shrub steppe; *Acacia coriacea* & hakea over hard spinifex *Triodia basedowii*	2.2			H
100	Hummock grasslands, shrub steppe; *Acacia delibrata* over soft spinifex				M
101	Hummock grasslands, shrub steppe; *Acacia pachycarpa* over soft spinifex				M
102	Hummock grasslands, shrub steppe; *Acacia pachycarpa* over *Triodia basedowii*				M
106	Hummock grasslands, shrub steppe; hakea over soft spinifex soft spinifex				M
117	Hummock grasslands, grass steppe; soft spinifex	410.4			M
125	Bare areas; salt lakes	51,710.9			L

Beard Veg Assoc	Ecosystem Description	IUCN I-IV (hectares)	Non-IUCN Reserve	CALM Purchased Lease	Priority
134	Mosaic: Hummock grasslands, open low tree steppe; desert bloodwood and feathertop spinifex (on) sandhill/Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills	734,969.2			L
136	Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills				M
137	Hummock grasslands, low tree steppe; desert walnut over (soft) spinifex/plectrachne on sandplain				M
138	Mosaic: Hummock grasslands, low tree steppe; eucalypts over feathertop between dunes/Hummock grasslands, patchy shrub steppe; *Acacia pachycarpa* over soft spinifex on lateritic rises				M
139	Hummock grasslands, patchy shrub steppe; mulga over hard spinifex on laterite				H
152	Hummock grasslands, grass steppe; soft & hard spinifex soft spinifex				M
155	Hummock grasslands, low tree steppe; eucalypts over soft and feathertop spinifex between sandhills				M
157	Hummock grasslands, grass steppe; hard spinifex *Triodia wiseana*				M
173	Hummock grasslands, shrub steppe; kanji over soft spinifex & *T. wiseana* on basalt				M
174	Hummock grasslands, shrub steppe; mixed shrubs over soft spinifex				M
175	Short bunch grassland - savanna/grass plain				H
178	Hummock grasslands, grass steppe; hard spinifex *Triodia basedowii*				M
217	Hummock grasslands, steppe woodland; desert oak (*Allocasuarina decaisneana* & soft spinifex (soft spinifex)				M
218	Hummock grasslands, shrub steppe; corkwood (*Hakea suberea*) & acacia species over soft spinifex soft spinifex				M
219	Hummock grasslands, grass steppe; soft & hard spinifex & *T. basedowii*				M
699	Shrublands, pindan; *Acacia eriopoda* shrubland with scattered low bloodwood (*E. dichromophloia*) & *E. setosa* over soft & curly spinifex on sandplain				M
2041	Succulent steppe with scrub; teatree over saltflats	31,145.6			H
2151	Low woodland; coolibah & paperbark (*Melaleuca* sp.)	5,192.6			H
2175	Grass savanna on clay plains (Tanami)				H

Northern Territory:

Veg Number	Ecosystem Description	IUCN I-IV (hectares)	Non-IUCN Reserve	Conservation Purchased Lease	Priority
82	*Triodia basedowii* hummock grassland with *A. aneura* (Mulga) tall sparse-shrubland overstorey between	yes			
90	*Triodia irritans* (Porcupine Grass) open-hummock grassland.	yes			
93	*Triodia basedowii* (Hard Spinifex) hummock grassland with *Allocasuarina decaisneana* (Desert Oak) open-woodland overstorey between dunes.	yes			
27	*E. microtheca* (Coolibah) low open-woodland with open-grassland understorey.	0	0	0	
30	*E. gongylocarpa* (Marble Gum) open-woodland with open-hummock grassland understorey.None	0	0	0	
43	Eucalyptus low open-woodland and/or Acacia sparse-shrubland with *Triodia spicata* (Spike Flower	0	0	0	
52	*Melaleuca glomerata* (Inland Teatree) open-shrubland.	0	0	0	
58	*A. aneura* (Mulga)/mixed species low open-woodland with open-grassland understorey.None	0	0	0	
59	*A. estrophiolata* (Ironwood), *Atalaya hemiglauca* (Whitewood) low open-woodland with open-grassland understorey.	0	0	0	
65	*A. aneura* (Mulga) tall open-shrubland with *Eragrostis eriopoda* (Woollybutt) open grassland understorey.	0	0	0	

Veg Number	Ecosystem Description	IUCN I-IV (hectares)	Non-IUCN Reserve	Conservation Purchased Lease	Priority
66	*A. aneura* (Mulga) tall open-shrubland with Cassia, Eremophila (Fuchsia) open-shrubland understorey.	0	0	0	
67	*A. ammobia* tall open-shrubland with sparse-grassland understorey.	0	0	0	
68	*A. kempeana* (Witchetty Bush) Acacia tall open-shrubland with Cassia, Eremophila (Fuchsia) open-shrubland understorey.	0	0	0	
69	*A. aneura* (Mulga) tall sparse-shrubland with Aristida contorta (Bunched Kerosene Grass) or Triodia open-tussock/hummock grassland understorey.	0	0	0	
71	*A. aneura* (Mulga) tall sparse-shrubland with grassland understorey.	0	0	0	
72	*A. kempeana* (Witchetty Bush) sparse-shrubland to tall sparse-shrubland with grassland understorey.	0	0	0	
73	*A. tetragonophylla* (Dead Finish), *A. kempeana* (Witchetty Bush) sparse-shrubland with herb/grassland understorey.	0	0	0	
76	*Triodia pungens* (Soft Spinifex), *Plectrachne schinzii* (Curly Spinifex) hummock grassland with Acacia tall sparse-shrubland overstorey.	0	0	0	
78	*Triodia spicata* (Spike Flowered Spinifex) hummock grassland with *Grevillea wickhamii* (Holly Grevillea), Acacia sparse-shrubland overstorey.	0	0	0	
79	*Plectrachne melvillei* (Spinifex) hummock grassland with *A. aneura* (Mulga), *A. kempeana* (Witchetty Bush) tall open-shrubland overstorey.	0	0	0	
81	*Triodia basedowii* (Hard Spinifex) hummock grassland with Acacia tall sparse-shrubland overstorey.	0	0	0	
83	*Triodia basedowii* (Hard Spinifex) or *Triodia pungens* (Soft Spinifex) hummock grassland with *E. gamophylla* (Blue Mallee), Acacia tall sparse-shrubland overstorey.	0	0	0	
84	*Triodia basedowii* (Hard Spinifex) hummock grassland with *E. gamophylla* (Blue Mallee) tall sparse-shrubland overstorey.	0	0	0	
86	*Triodia pungens* (Soft Spinifex) or *Triodia basedowii* (Hard Spinifex) hummock grassland with Acacia tall sparse-shrubland overstorey between dunes	0	0	0	
87	Triodia (Spinifex) open-hummock grassland with *A. aneura* tall sparse-shrubland overstorey.	0	0	0	
89	*Triodia pungens* (Soft Spinifex) open-hummock grassland with scattered shrubs. None	0	0	0	
92	*Triodia clelandii* (Weeping Spinifex) hummock grassland with mixed species low open-woodland overstorey.	0	0	0	
94	*Triodia basedowii* (Hard Spinifex) hummock grassland with *Allocasuarina decaisneana* (Desert Oak) low open-woodland or Acacia tall sparse-shrubland overstorey.	0	0	0	
111	Halosarcia (Samphire) low open-shrubland fringing bare salt pans.	0	0	0	
112	Bare salt pan.	0	0	0	

Subregional constraints in order of priority

(see Appendix B, key g)

Western Australia:

Competing Land Uses: Mainly Aboriginal interests, concerning native title. Reserve acquisition can only proceed under a cooperative management model.

Northern Territory:

No information supplied.

Bioregional and subregional priority for reserve consolidation

Western Australia:

GSD2 is reservation Class 2b (see Appendix D, and Appendix C, rank 4) with 4.6% of area in conservation reserve, and > 30% natural vegetation.

Northern Territory:

No information supplied.

Reserve management standard

Western Australia:
The Great Sandy Desert has one national park (part of Rudall River), and one large nature reserve (McLarty Hills). Neither area has permanent staff. Both are visited on an occasional basis, by Karratha or Broome based staff.

Rudall River National Park: Reserve Management Standard is (i) (see Appendix C, rank 5). Rudall River National Park has no management plan, and is rarely visited by staff despite having high tourist visitation, two Aboriginal communities within the park (Parnngurr and Punmu, between 200-500 people), two mining communities relatively close to the park (Nifty and Telfer), and ongoing feral animal problems with camel and occasionally donkey. Formal fire management is absent, although Aboriginal people provide a regular burning regime along roads.

McLarty Hills Nature Reserve: Reserve Management Standard is (i-ii). Very remote, and rarely visited by anyone. No on-ground management to speak of, despite severe degradation of the Dragon-Tree Soak wetland by camel.

Class	Purpose	Name	Category	Reserve Management Rank[1]
A	Conservation of fauna and flora & Recreation.	Rudall River National Park	National Park	i
A	Conservation of fauna and flora.	McLarty Hills Nature Reserve	Nature Reserve	i-ii

[1]Appendix C, rank 5

Northern Territory:
No information supplied.

Off reserve conservation

Priority species or groups and existing recovery plans

Western Australia:

Species	Specific Recovery Plan	General Recovery Plan
Dasycercus cristicauda	Yes - National Threatened Species Recovery team	Action Plan for Australian Marsupials and Monotremes
Dasycercus hillieri	No	Action Plan for Australian Marsupials and Monotremes
Notoryctes caurinus	No	Action Plan for Australian Marsupials and Monotremes
Macrotis lagotis	Yes - National Threatened Species Recovery team	Action Plan for Australian Marsupials and Monotremes
Pezoporus occidentalis	Yes - IRP	Action Plan for Australian Birds
Egernia kintorei	Yes - National Threatened Species Recovery team	Action Plan for Australian Reptiles
Aspidites ramsayi	No	Action Plan for Australian Reptiles
Ardeotis australis	No	Action Plan for Australian Birds
Polytelis alexandrae	No	Action Plan for Australian Birds
Acacia auripila	No	No
Goodenia hartiana ms	No	No
Ptilotus mollis	No	No
Thysanotus solitaster	No	No

Northern Territory:
No information supplied.

Appropriate species recovery actions

Western Australia:

Species	Recovery Actions[1]	Recovery Descriptions
Dasycercus cristicauda	xii	Research - Low level of knowledge.
Dasycercus hillieri	xii, xiv	Research - Low level of knowledge. Other - Less well known that *D. cristicauda.*
Notoryctes caurinus	xii, xiv	Research - Low level of knowledge.
Macrotis lagotis	xiv	Other - Definition of areas inhabited, and monitoring of some populations
Pezoporus occidentalis	xii, xiv	Research - Locate and protect any existing populations
Egernia kintorei	xii, xiv	Research - Low level of knowledge.
Species	Recovery Actions[1]	Recovery Descriptions
Aspidites ramsayi	xii	Research - Appears secure
Ardeotis australis	none	Research - Appears secure
Polytelis alexandrae	xii, xiv	Research - Low level of knowledge.
Acacia auripila	xii, xiv	Research - Poor knowledge
Goodenia hartiana ms	xii, xiv	Research - Poor knowledge
Ptilotus mollis	xii, xiv	Research - Poor knowledge
Thysanotus solitaster	xii, xiv	Research - Poor knowledge

[1]Appendix B, key h.

Northern Territory:

Species	Recovery Actions[1]	Recovery Descriptions
Dasycercus cristicauda	xiii, vii, ix	Capacity building with stakeholders. Feral animal control. Fire management.
Lagorchestes hirsutus	xiv	Other - Re-introduction of extirpated populations.
Notoryctes typhlops	vii, ix	Feral animal control to reduce numbers of feral cats and foxes. Fire management to reduce the number of extensive hot fires.
Petrogale lateralis MacDonnell Ranges race	v, vii, ix,	Fencing for exclusion of stock from colony sites. Feral animal broad-scale control of foxes and cats. Fire management to reduce the incidence of extensive hot fires.
Sminthopsis psammophila	vii, ix	Feral animal control to reduce numbers of feral cats and foxes. Fire management to reduce the incidence of extensive hot fires, and possibly increase in incidence of fine-scale cooler fires.
Trichosurus vulpecula	v, vii, ix	Fencing is possibly useful in some areas to exclude stock, in order to protect habitat. Feral animal control of camels, donkeys, foxes and cats. Fire management to reduce the incidence of extensive hot fires.
Pezoporus occidentalis	xii	Research to establish occurrence, distribution, abundance and threats.
Polytelis alexandrae	vii, ix	Feral animal control to reduce numbers in rabbits, camels, etc. Fire management to reduce the incidence of extensive hot fires.
Stictonetta naevosa	xi	Reinstatement of hydrology on a national-scale, rather than specific actions in this subregion.
Egernia kintorei	xiii, vii, ix	Capacity building with stakeholders - fire management and feral animal control through IPAs. Feral animal broad-scale control of cats & foxes. Fire management to reduce the incidence of extensive hot fires.

[1]Appendix B, key h.

Ecosystems and existing recovery plans

Western Australia:

Community	Specific Recovery Plan	General Recovery Plan
Semi-permanent pools along course of Rudall River.	No	No
Small spring wetlands, Percival Lakes	No	No
Any other permanent or semi-permanent wetlands within the sub-bioregion	No	No

Northern Territory:
No information supplied.

Appropriate ecosystem recovery actions

Western Australia:

Community	Recovery Actions[1]	Recovery Descriptions
Semi-permanent pools along course of Rudall River.	vii, vi	Feral animal control, especially of camels. Weed control.
Small spring wetlands, Percival Lakes	vii	Feral animal control, especially of camels.
Any other permanent or semi-permanent wetlands within the sub-bioregion	vii	Feral animal control, especially of camels.

[1]Appendix B, key h.

Northern Territory:
No information supplied.

Subregion priority for off reserve conservation

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

Northern Territory:
No information supplied.

Conservation actions as an integral part of NRM

Existing NRM Actions

Western Australia:
Almost nothing, except some very limited threat abatement planning as part of NRM e.g. pest management.

Northern Territory:
Other: Newhaven station recently purchased by Birds Australia (area in GSD2 184, 183 ha); Monitoring programs established on all pastoral leaseholds.

Threat Abatement Planning: Some regional fire management, monitoring and control through regional offices of Bushfires Council.

Legislation: Fire management and tourist pressure managed in Uluru and Kata Tjuta National Park.

Feasible Opportunities for NRM

Western Australia:
Threat Abatement Planning as Part of NRM: Further pest management.

Capability Building: With Aboriginal communities.

Northern Territory:
Threat Abatement Planning: There is scope for greater capacity for broad-scale management of fire, ferals and weeds.

Impediments or Constraints to Opportunities

Western Australia:
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, Punmu, Kunawarritji, Kiwikurra, Bililuna)

Northern Territory:
No information supplied.

Subregions where specific NRM actions are a priority to pursue

Western Australia:
The NRM priority for GSD2 is (ii) (see Appendix C, rank 7), indicating that there are significant constraints to integrate conservation as part of a production or development system. This mainly applies to acquisition of reserves under Native Title, and lack of control of feral herbivores.

Northern Territory:
The NRM priority for GSD2 is (i), indicating that there are major constraints to implement effective NRM actions to achieve biodiversity outcomes. There is a need to expand resources to, and capability of, Aboriginal landowners for conservation management.

Data gaps

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

Western Australia:
Vegetation and Regional Ecosystem Mapping: No environmental geology / regolith mapping 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).

Floristic Data: Subregional flora is poorly known, with few intensive studies. Only small areas have been examined in detail by botanists. Quadrat-based floristic data is available from few or no localities.

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

Ecological and Life History Data: There is little 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). Information is sparse on providing 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 wetland associated with palaeo-drainage systems within the Great Sandy Desert.
- 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.

Northern Territory:
Other Priority Data Gaps Include:
Monitoring to assess trends and responses to landscape-wide disturbance.

Ecological and Life History Data

Systematic Fauna Survey: Survey information.

Vegetation and Regional Ecosystem Mapping: Survey information.

Source

References cited

No.	Author	Date	Title	Publication Details	Pub. Type
764	Baker, L.M. and Johnson, K.A.	(undated).	Draft Recovery Plan for the Mulgara (*Dasycercus cristicauda*)	Conservation Commission of the Northern Territory	O
717	Bellchambers, K. and Johnson, K.A.	(1991).	The Recovery Plan for the Greater Bilby *Macrotis lagotis*	Endangered Species Programme and the Conservation Commission of the Northern Territory, Alice Springs	R
091	Bettenay, E., Churchward, H.M., McArthur, W.M. and Northcote, K.H.	(1967).	Atlas of Australian Soils. Explanatory data for Sheet 6, Meekatharra - Hamersley Range area. Commonwealth Scientific and Industrial Research Organisation, and Melbourne University Press.	Cambridge University Press, London and New York.	O
778	Blyth, J.	(1996).	Night parrot (*Pezoporus occidentalis*) Interim Recovery Plan for Western Australia 1996 to 1998 (IRP No 4)	Department of Conservation and Land Management	O
181	Cogger, H., Cameron, E., Sadlier, R. and Eggler, P.	(1993).	The Action Plan for Australian Reptiles.	Australian Nature Conservation Agency, Canberra.	R
278	Environmental Protection Authority	(1993).	Conservation Reserves for Western Australia. Red Book Status Report. EPA Report 15.	Environmental Protection Authority. Perth, Western Australia.	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
484	McAlpin, S.	(2001).	A Recovery Plan for the Great Desert Skink (*Ergernia kintorei*) 2001-2011.	Arid lands Environment Centre.	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, 054, 094, 118, 120, 182, 210, 258, 266, 272, 281, 383, 387, 407, 419, 493, 625, 634, 635, 636, 637, 638, 647, 648 and 699 in Appendix A.