Gascoyne 1 *(GAS1 – Ashburton subregion)*

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OCTOBER 2001

Subregional description and biodiversity values

Description and area

Mountainous range country divided by broad flat valleys, associated with Ashburton River Catchment of the Ashburton Basin (shales, sandstones and conglomerates), and the north-western part of Bangemall Basin (sandstone, shale, carbonates). Mulga / snakewood low woodlands occur on shallow earthy loams over hardpan on the plains, with mulga scrub and Eremophila shrublands on the shallow stony loams of the ranges. Low mixed shrublands on hills with other areas supporting large areas of Triodia. Arid (desert) climate with bimodal (winter and summer) rainfall, with tropical monsoon influences. The subregional area of GAS1 is 4, 039, 387ha.

Dominant land use

Dominant land use is Grazing – (ix) native pastures (see Appendix B, key b), (xi) UCL and Crown reserves, (xiii) conservation.

Continental Stress Class

The Continental Stress Class for GAS1 is 4.

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

Gorges of Barlee Range Nature Reserve:
Particularly those of Kookhabinna Creek. Deeply incised gorges, up to 100m deep, containing extensive permanent spring-fed streams and pools. Contain relictual species: an undescribed *Bothriembryon* landsnail, *Pseudophryne douglasi* (a frog), plants (*Wurmbea saccata*), and *Rhinonicteris aurantius* (a bat). Spectacular exposures of banded sedimentary formations, and many waterfalls and gorge features. This is the only area within GAS1 where any intensive biology has been undertaken.

Yadjiyugga Claypan:
A large ephemeral claypan, with open coolibah woodland (*Eucalyptus victrix*) over bunch grass (*Eriachne benthamii*) and samphire (*Tecticornia verrucosa*). Also contains an undescribed *Peplidium*. Previously severely degraded by stock and donkeys, it has been protected by exclusion fencing since 1996. Recovery has been very successful. This flora assemblage is unique to the GAS1 subregion.

Centres of Endemism:
There are no known centres of endemism with GAS1, however there is a strong possibility of troglofauna in calcrete deposits associated with the Lyons River.

Refugia:
Note that Morton *et. al* (1995) list no refugia in GAS1, however the following should be included:

- Gorges of the Barlee Range Nature Reserve. Permanent water and protected from fire. Provide refuge sites for humidophiles and fire intolerant species.
- Yadjiyugga Claypan (see above).
- Calcrete deposits of PIL3, for troglofauna. No survey has yet been undertaken, but calcrete deposits along the southern boundary of GAS1 are very likely to contain troglodites (Humphreys 2001).
- Permanent spring systems, such as Minnie Spring (on the Henry River) and the Irragully Creek (Wanna Station), and elsewhere scattered through the bioregion.
- Range country throughout the bioregion would provide areas of fire refuge.

High Species and Ecosystem Diversity:

- There is high *Eremophila* diversity in GAS1.
- Stygofaunal crustacean fauna within calcrete environments. So far unknown, but indications are for a significant fauna.

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 (Environmental Protection Authority 1975). These recommendations were reviewed in 1993 (Environmental Protection Authority 1993). Reserve recommendations for GAS1 were limited to endorsing the existing Barlee Range Nature Reserve (recommendation. 8.15), and deferring any action on the proposed Teano Range – Jeealia River Downs reserve (recommendation 8.17) (Environmental Protection Authority 1993). No other subregional or bioregional planning for biodiversity conservation has been attempted.

Wetlands

Wetlands of National significance (DIWA listings)

Name and Code	Description[1]	Condition[2]	Trend[3]	Reliability[4]	Threatening Processes[5]
Kookhabinna Creek Gorges, GAS001WA	B2, B14	iii	iv	ii	v (cattle, donkey), vi (buffel grass)
Yadjiyugga Claypan, GAS004WA	B6	iii	iv	iii	v (cattle, donkey, but now fenced)

[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]
Calcrete aquifers of the Lyons River	Southern boundary of GAS1	B19	Probably stygofauna	iv	iv	ii	vi (weeds)
Minnie Spring	Henry River, adjacent to Barlee Range NR	B2, B17	Large running spring wetlands	ii	iii	ii	v (cattle, donkey), vi (weeds; buffel grass)
Irragully Creek	Flows into Ashburton from Wanna Station.	B2, B17	Spring wetlands and ephemeral pools	ii	iii	ii	v (cattle, donkey), vi (weeds; buffel grass)
Major pools in Ashburton and Hardy Rivers	Many and scattered along rivers	B2,	Semi-permanent and ephemeral pools and flood-outs	i	iii	ii	v (cattle, donkey), vi (weeds; buffel grass)

[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]
All fringing vegetation of riparian zones	ii (Buffel grass very common, permanent and semi-permanent pools affected by cattle and feral animals.)	iii	ii	iv (cattle), v (donkeys, horses), vi (buffel grass, date palm, ruby dock), vii

[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 GAS1.

Other ecosystems at risk

Community	Status	NVIS[1]	Condition[2]	Trend[3]	Reliability[4]	Threatening Processes[5]
Yadjiyugga Claypan		19, 39	ii	v	iii	iv (cattle), v (donkey) currently protected by fencing
Wetland systems of the Ashburton and Lyons drainage (including permanent and semi-perm pools, springs and		10, 15, 19,	i	iii	ii	iv (cattle), v (donkey, horse, cattle), vi (buffel grass)
Dwarf shrublands of the Ashburton catchment (Ashburton Downs – Kooline land system)		29	ii	iii	ii	iv (cattle), (v) donkey, horse, cattle), vii
Community	Status	NVIS[1]	Condition[2]	Trend[3]	Reliability[4]	Threatening Processes[5]
Saltbush community, alluvial plains of Ashburton (type CHAT in Payne *et al.* 1988)		31	i	iii	ii	iv (cattle), v (donkey, horse, cattle), vii
Bluebush community, alluvial plains of Ashburton (type CHMA in Payne *et al.* 1988)		31	i	iii	ii	iv (cattle), v (donkey, horse, cattle), vii
Mulga creekline community, alluvial plains of Ashburton (type MUCR in Payne *et al.* 1988)		20	ii	iii	ii	iv (cattle), vii, v (donkey, horse, cattle)

[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)					
Rhinonicteris aurantius	V	ii	iv	iii	No known threatening processes
SCHEDULE 1; RARE/LIKELY TO BECOME EXTINCT, DIV 3 (REPTILES)					
Liasis olivaceus barroni	V	iv (common and widespread)	iv	ii	Not currently threatened or likely to be
SCHEDULE 4; OTHER SPECIALLY PROTECTED FAUNA. DIVISION 2 (BIRDS)					
Falco peregrinus	SP	iii	iv	iii	No known threatening processes
OTHER SPECIES AT RISK WITHIN THE SUBREGION					
Sminthopsis longicaudata	P4	i	vi	i	v (possibly cats)
Macroderma gigas	P4	i	vi	ii	xii (barb-wire fences)
Pseudomys chapmani	P4	ii	vi	ii	Not threatened, or likely to be.
Ardeotis australis		i	vi	ii	v (possibly cats)
Burhinus grallarius		i	vi	ii	v (possibly cats)
Leiopotherapon ahenius	P4	i	vi	ii	iv, v (cattle, donkey pollution and fouling of waters)

[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 rigens	1	iii	vi	ii	iv, vi, vii
Helichrysum oligochaetum	1	iii	vi	ii	iv, vi, vii
PRIORITY 2					
Euphorbia drummondii sup sp. Pilbara (BG Thomson 3503)	2	ii	vi	ii	iv, vi, vii
Sida sp Barlee Range (S van Leeuwen 1642)	2	ii	vi	ii	iv, vi, vii
Stylidium weeliwolli	2	ii	vi	ii	iv, vi, 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 Code	Ecosystem Description	IUCN I-IV	Non-IUCN Reserve Ha	CALM-Purchased Lease	Priority
11	Medium woodland; coolibah (*E. microtheca*)	0.0	0.0	0.0	H
18	Low woodland; mulga (*Acacia aneura*)	0.0	0.0	0.0	H
28	Open low woodland; mulga	0.0	0.0	0.0	H
29	Sparse low woodland; mulga, discontinuous in scattered groups	0.0	0.0	0.0	H
39	Shrublands; mulga scrub	0.0	0.0	0.0	H
82	Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*	0.0	0.0	0.0	M
93	Hummock grasslands, shrub steppe; kanji over soft spinifex	0.0	0.0	0.0	M
95	Hummock grasslands, shrub steppe; acacia & grevillea over *Triodia basedowii*	0.0	0.0	0.0	H
98	Hummock grasslands, shrub steppe; kanji over soft spinifex & *T. basedowii*	0.0	0.0	0.0	M
103	Hummock grasslands, shrub steppe; snakewood over soft spinifex & *T. wiseana*	0.0	0.0	0.0	M
152	Hummock grasslands, grass steppe; soft & hard spinifex soft spinifex	0.0	0.0	0.0	M
157	Hummock grasslands, grass steppe; hard spinifex *Triodia wiseana*	81,455.8	0.0	0.0	L
158	Hummock grasslands, shrub steppe; kanji over *Triodia basedowii*	0.0	0.0	0.0	M
160	Shrublands; snakewood & *Acacia victoriae* scrub	0.0	0.0	0.0	H
161	Hummock grasslands, low open tree & shrub steppe; scattered eucalypts, *Acacia pachycarpa* over *Triodia basedowii*	0.0	0.0	0.0	H
162	Shrublands; snakewood scrub	0.0	0.0	0.0	M
163	Shrublands; eremophila and cassia dwarf scrub	0.0	0.0	0.0	H
165	Low woodland; mulga & snakewood (*A. eremaea*)	26.9	0.0	0.0	H
166	Low woodland; mulga & *Acacia victoriae*	0.0	0.0	0.0	M
168	Shrublands; mulga, *Acacia victoriae* & snakewood scrub	0.0	0.0	0.0	M
169	Shrublands; mulga & minnieritchie scrub	0.0	0.0	0.0	M
178	Hummock grasslands, grass steppe; hard spinifex *Triodia basedowii*	0.0	0.0	0.0	M
180	Shrublands; mulga open scrub	0.0	0.0	0.0	M
181	Shrublands; mulga & snakewood scrub	33,315.8	0.0	0.0	H
197	Sedgeland; sedges with scattered medium trees; coolibah over various sedges & forbs	0.0	0.0	0.0	H
264	Low woodland; *Acacia victoriae* & snakewood	0.0	0.0	0.0	H
563	Shrublands; acacia scrub (*Acacia* sp. unknown various locations)	0.0	0.0	0.0	H
567	Hummock grasslands, shrub steppe; mulga & kanji over soft spinifex & *T. basedowii*	0.0	0.0	0.0	M
580	Mosaic: Shrublands; eremophila and cassia dwarf scrub/Hummock grasslands, grass steppe; hard spinifex *Triodia wiseana*	0.0	0.0	0	H
588	Shrublands; *Acacia victoriae* scrub	0.0	0.0	0.0	M
624	Hummock grasslands, shrub steppe; mulga over soft spinifex & *T. basedowii*	0.0	0.0	0.0	H
641	Medium woodland; coolibah & river gum	0.0	0.0	0.0	H
1162	Hummock grasslands, grass steppe; hard spinifex *Triodia wiseana* & *T. basedowii*	0.0	0.0	0.0	M
1322	Shrublands; Acacia sclerosperma, *A. victoriae* & snakewood scrub	0.0	0.0	0.0	M

Beard Veg Code	Ecosystem Description	IUCN I-IV	Non-IUCN Reserve Ha	CALM-Purchased Lease	Priority
1601	Mosaic: Shrublands; snakewood & *A. victoriae* scrub/Hummock grasslands; grass steppe, hard spinifex *Triodia basedowii*	0.0	0.0	0.0	M
1602	Mosaic: Shrublands; snakewood scrub/Hummock grasslands; grass steppe, hard spinifex *Triodia basedowii* & *T. wiseana*	0.0	0.0	0.0	M
2675	Hummock grasslands, low tree & shrub steppe; scattered eucalypts, kanji over *Triodia pungens* & *T. basedowii*	0.0	0.0	0.0	M

Subregional constraints in order of priority

(see Appendix B, key g)

Economic Constraints: In terms of the cost of land acquisition as well as constraints in terms of implementing management. Most land is pastoral lease, and productive systems are of high value.

Competing Land Uses: In particular current and prospective mining interests and pastoral values.

Bioregional and subregional priority for reserve consolidation

GAS has 10.4% of its surface under some form of conservation tenure. GAS1 has 2.8%, placing it in reservation Class 2b (see Appendix D, and Appendix C, rank 4). There is strong bias at the subregional level.

Reserve management standard

GAS1 contains one Nature Reserve (Barlee Range Nature Reserve) but has no residential staff. Managed from both Karratha and Exmouth. Visited approximately 6 times per year. Fencing around Yadjiyugga Claypan maintained, feral herbivores controlled by periodic aerial shooting. The boundaries are not fenced and no weed control is undertaken, even though ruby dock has appeared in the nature reserve over the last 4 years or so.

Class	Purpose	Name	Category	Reserve Management Rank[1]
A	Conservation of fauna and flora.	Barlee Ranger Nature Reserve	Nature Reserve	ii

[1]Appendix C, rank 5

Off reserve conservation

Priority species or groups and existing recovery plans

Species	Known Information	Specific Recovery Plan	General Recovery Plan
Ardeotis australis	Commonly observed at Barlee Range Nature Reserve, and elsewhere in the bio-subregion. Not considered under threat in this area.	No	Action Plan for Australian Birds
Burhinus grallarius	Observed at Barlee Range Nature Reserve, and probably relatively common elsewhere in the bio-subregion.	No	Action Plan for Australian Birds
Falco peregrinus	Uncommon resident. Very little data apart from occasional sightings. No information on local GAS1 population.	No	Action Plan for Australian Birds
Leiopotherapon ahenius	Uncommon, although present in permanent pools of Kookhabinna Gore (Barlee Range Nature Reserve). Also known from Nicholl Spring, 350 km east, on the boundary of GAS1 and GAS3 (within the Ashburton drainage). Requires more survey, and research into tolerance of disturbance from cattle in areas of the Ashburton catchment between these two sites.	No	No
Liasis olivaceus	Known mainly from throughout Barlee Range Nature Reserve, where it appears to be common along water courses. It is not threatened, and should not be listed as such.	No	Action Plan for Australian Reptiles

Species	Known Information	Specific Recovery Plan	General Recovery Plan
Macroderma gigas	A population of *Macroderma gigas* is present within Barlee Range Nature Reserve. Occasional dead bats have been found on barbed wire fences on the reserve boundary. There are records of *Macroderma* living in a cave on Ullawarra, south of the reserve. Further survey and monitoring required.	No	Action Plan for Australian Bats
Pseudomys chapmani	Present within Barlee Range Nature Reserve, and probably elsewhere within the bio-subregion.	No	Action Plan for Australian Rodents
Rhinonicteris aurantius	A population of *Rhinonicteris aurantius* is known from Barlee Range Nature Reserve, and is presumed to be breeding there (Kookhabinna Gorge). Maternity roosts have not been identified. It may be present elsewhere in GAS1.	No	Action Plan for Australian Bats
Sminthopsis longicaudata	A population of *Sminthopsis longicaudata* is present within Barlee Range Nature Reserve. It may be present elsewhere in GAS1.	No	Action Plan for Australian Marsupials and Monotremes
Priority 1 and 2 Flora species including *Eremophila rigens, Euphorbia drummondii* sup sp. Pilbara (BG Thomson 3503), *Helichrysum oligochaetum, Sida* sp Barlee Range (S van Leeuwen 1642), *Stylidium weeliwolli, Wurmbea saccata*	Very little information available.	No	No

Appropriate species recovery actions

Species	Recovery Actions[1]	Recovery Descriptions
Ardeotis australis	xii	Status of species is uncertain. Needs basic documentation of distribution and abundance, and threatening processes.
Burhinus grallarius	xii	Status of species is uncertain. Needs basic documentation of distribution and abundance, and threatening processes.
Falco peregrinus	xii	Little data on status of GAS1 population. Unlikely that specific recovery actions are required.
Leiopotherapon ahenius	xii	Status of population is uncertain. Needs basic documentation of distribution and abundance, and threatening processes.
Liasis olivaceus	xii	Barlee Range Nature Reserve population is secure and common. Further information for rest of bioregion is required.
Macroderma gigas	v, xii	Status of population is uncertain. Barbed wire fences to be removed where possible or replaced with plain wire.
Pseudomys chapmani	None required	Status of species is secure; widespread and abundant. No further action necessary.
Rhinonicteris aurantius	xii	Research into habitat requirements and distribution.
Sminthopsis longicaudata	xii	Status of this species throughout in GAS1 is uncertain. More survey work is required, as habitat appears highly suitable.
Priority 1 and 2 Flora species including *Eremophila rigens, Euphorbia drummondii* sup sp. Pilbara (BG Thomson 3503), *Helichrysum oligochaetum, Sida* sp Barlee Range (S van Leeuwen 1642), *Stylidium weeliwolli, Wurmbea saccata*	xii	Status of species is uncertain. Needs basic documentation of distribution and abundance, and threatening processes.

[1]Appendix B, key h.

Ecosystems and appropriate recovery actions

Community	Recovery Action[1]	Recovery Descriptions
Yadjiyugga Claypan	i, ii, iii, v, vi, vii, ix, xii	Habitat retention through reserves or on other State lands (including pastoral lease). Fencing has been done but needs to be maintained. Weed control. Feral animal control. Fire management, with specific fire program to encourage a mosaic fire/age distribution. Research into species distributions, requirements and threatening processes.
Wetland systems of the Ashburton and Lyons drainage (including permanent and semi-perm pools, springs and	i, ii, iii, vi, ix, vii, xii	Habitat retention through reserves or on other State lands (including pastoral lease). Weed control of date palms, however it is probably impossible to do anything about buffel grass. Fire management, with specific fire program to encourage a mosaic fire/age distribution. Feral animal control. Research into species distributions, requirements and threatening processes.
Dwarf shrublands of the Ashburton catchment (Ashburton Downs – Kooline land system)	i, ii, iii, v, vii, vi, ix, xii	Habitat retention through reserves or on other State lands (including pastoral lease). Fencing stock away from sensitive areas, especially highly palatable communities like blue-bush, salt-bush etc. Feral animal control. Weed control, however it is probably impossible to do anything about buffel grass. Fire management, with specific fire program to encourage a mosaic fire/age distribution. Research into species distributions, requirements and threatening processes.
Saltbush community, alluvial plains of Ashburton (type CHAT in Payne *et al.* 1988)	i, ii, iii, v, vii, vi, ix, xii	Habitat retention through reserves or on other State lands (including pastoral lease). Fencing stock away from sensitive areas, especially highly palatable communities like blue-bush, salt-bush etc. Feral animal control. Weed control, however it is probably impossible to do anything about buffel grass. Research into species distributions, requirements and threatening processes.
Bluebush community, alluvial plains of Ashburton (type CHMA in Payne *et al.* 1988)	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands (including pastoral lease). Fencing stock away from sensitive areas, especially highly palatable communities like blue-bush, salt-bush etc. Feral animal control. Weed control, however it is probably impossible to do anything about buffel grass. Fire management, with specific fire program to encourage a mosaic fire/age distribution. Research into species distributions, requirements and threatening processes.
Mulga creekline community, alluvial plains of Ashburton (type MUCR in Payne *et al.* 1988)	i, ii, iii, v, vii, vi, ix, xii	Habitat retention through reserves or on other State lands (including pastoral lease). Fencing stock away from sensitive areas, especially highly palatable communities like blue-bush, salt-bush etc. Feral animal control. Weed control, however it is probably impossible to do anything about buffel grass. Fire management, with specific fire program to encourage a mosaic fire/age distribution. Research into species distributions, requirements and threatening processes.

[1]Appendix B, key h

Existing ecosystem recovery plans

There are no recovery plans for ecosystems at risk in GAS1.

Subregion priority for off reserve conservation

The off park priority for conservation is (ii) (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

Institutional Reform: GMS (Gascoyne – Murchison Strategy) restructuring of the pastoral industry.

Threat Abatement Planning as Part of NRM: Feral animal control, mainly feral herbivores. There is no weed control to speak of.

Feasible opportunities for NRM

Legislation: Including duty of care for leasehold and other lands, especially pastoral and aboriginal leases, and mining areas.

Institutional Reform: e.g. Rural reconstruction, industry reconstruction, new tenure and management arrangements; includes resumption of high quality lands for reservation from existing pastoral leases (GMS).

Threat Abatement Planning as Part of NRM: e.g. Pest management, feral herbivore control on pastoral lands.

Industry Codes of Practice: Potentially powerful, but due to the small size of most pastoral companies involved, effects will be patchy and up to individuals.

Environmental Management Systems: Can be very powerful, but will be limited as per comments in Industry Codes of Practice above.

Capacity Building: Further capability building in resource and pastoral industries.

Other Planning Opportunities: including local and State government planning for a CAR conservation reserve system (including GMS).

Impediments or constraints to opportunities

- Lack of funding to acquire lands on open market. Lack of funds to adequately manage our existing estate, let alone any further acquisitions. Impediments exist in operations of the Pastoral Lands Board (need to re-structure un-viable leases after reserve areas are removed);
- Need to increase awareness of conservation values through education of various industry (mining, pastoral) groups and the public in general.

- High value conservation areas are held under pastoral leases, and we can't afford to purchase them. Resumption is the only option.
- Control of feral herbivores is at an inadequate level – not enough money available to undertake effective control within Karijini National Park.
- Weed control is inadequate.
- Need more resources for basic inventory research and work into threatened species.

Subregions where specific NRM actions are a priority to pursue

The NRM priority for GAS1 is (ii) (see Appendix C, rank 7), indicating that there are significant constraints to integrate conservation as part of production / development system.

Data gaps

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

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 (Barlee Range Nature Reserve). Quadrat-based floristic data is available from relatively few localities (all in Barlee Range Nature Reserve).

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

Ecological and Life History Data: 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, kapok bush and ruby dock).

Other Priority Data Gaps Include:

- 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 quantitative data on the impact of changes to fire regimes in hummock grasslands, particularly upon vertebrate communities, invertebrate communities, and non-vascular plants.
- No quantitative data on the impact of weed colonisation (especially buffel grass) on riverine and other grassland communities, particularly upon recruitment of perennial species, and consequent effects on invertebrate and vertebrate communities.
- Poor understanding of subregional troglofaunas.

Source

References cited

No.	Author	Date	Title	Publication Details	Pub. Type
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258	Duncan, A., Barry Baker, G. and Montgomery, N.	(1999).	The Action Plan for Australian Bats.	Environment Australia.	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
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391	Humphreys, W.F.	(2001).	Groundwater calcrete aquifers in the Australian arid zone: the context to an unfolding plethora of stygal biodiversity. Pp 63 - 83 in Subterranean Biology in Australia 2000, W.F. Humphreys and M.S. Harvey (eds).	Records of the Western Australian Museum, Supplement No. 64.	B
452	Lee, A.K.	(1995).	The Action Plan for Australian Rodents	Environment Australia - Biodiversity Group, Threatened Species and Communities Section	B
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
541	Payne, A.L., Mitchell, A.A. and Holman, W.F.	(1988).	An inventory and condition survey of rangelands in the Ashburton River catchment, Western Australia.	Department of Agriculture Technical Bulletin No. 62.	R

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

Other relevant publications

See reference numbers 012, 024, 026, 065, 082, 094, 118, 148, 173, 181, 182, 258, 266, 281, 383, 387, 399, 402, 407, 419, 463, 493, 620, 625, 634, 635, 636, 637, 638, 647, 648 and 699 in Appendix A.