Great Victoria Desert 1 *(GVD1 – Great Victoria Desert Shield subregion)*

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Subregional description and biodiversity values

Description and area

The western end of GVD1 is underlain by Yilgarn Craton. There is a higher proportion of sandplains in comparison to the entire bioregion. To the east is an arid active sand-ridge desert of deep Quaternary aeolian sands overlying Permian and Mesozoic strata of the Officer Basin. Landforms consist of salt lakes and major valley floors with lake derived dunes. Sand plains with patches of seif dunes running east west. Areas of moderate relief with out-cropping and silcrete-capped mesas and plateaus (breakaways). The subregion contains major a paleo-channel of Ponton Creek.

Spinifex (*Triodia spp*) and mallee (*Eucalypt*us *kingsmillii, E. youngiana*) over hummock grassland dominated by *Triodia basedowii* occur on the aeolian sand plain. Scattered marble gum (*E. gongylocarpa*) and native pine (*Callitris*) occur on the deeper sands of the sand plains. Mulga and acacia woodlands occur mainly on the colluvial and residual soils. Halophytes such as salt bush (*Atriplex*), Bluebush (*Kochia*), and samphire (*Arthrocnemum*) occur, margins of salt lakes and in saline drainage areas. The climate is arid, with summer and winter rain approximately 190mm per annum. Subregional area is 5, 442, 741ha.

Dominant land use

(see Appendix B, key b)

Category	Description	Percentage of Subregion
x	Aboriginal Reserve	12.33%
xiii	Conservation Reserves	7.05%
ix	Grazing Native Pastures	24.85%
xv	Other – Lakes and major watercourse	0.09%
ix	Unallocated Crown Land and Crown Reserves	55.68%

Continental Stress Class

The Continental Stress Class for GVD1 is 6.

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

Special features:

- Yellow sandplain communities with very diverse mammalian and reptile fauna, distinctive plant communities (D.Pearson pers. comm.) Threats from mining, extensive summer wildfires and feral predators.
- Assemblages of Queen Victoria Spring Great Victoria Desert (Burbidge *et al.* 1976) (A.George, D.Pearson pers. comm.).
- Hummock grasslands, open low tree steppe (mulga over *Triodia scariosa*) is confined entirely to the Great Victoria Desert 1 subregion.

Rare Vertebrates:

Princess Parrot (*Polytelis alexandrae*), Slender-billed Thornbill (*Acanthiza iredalei iredalei*), Major Mitchell Cockatoo (*Cacatua leadbeateri*), Malleefowl (*Leipoa ocellata*), Sandhill Dunnart (*Sminthopsis psammophila*), Southern Marsupial Mole (*Notoryctes typhlops*), Mulgara (*Dasycercus cristicauda*), Woma python (*Aspidites ramsayi*) and *Lerista puncticauda.* Records of *S. psammophila* are from two locations in GVD1. There is one Western Australian museum record for each of *N. typhlops* and *D. cristicauda* from Queen Victoria Spring Nature Reserve. *L. puncticauda* is endemic to GVD1.

Rare Flora:

Eucalyptus articulata is known from only 2 locations and is considered to be a genuinely rare species. *Conospermum toddii* is found on sand dune ridges across a large part of GVD1. Recent inspections of known populations have shown that germination and recruitment is high after fire but little else is understood of the species life history. *Thryptomene wittweri* has been found from the Pilbara (Hamersley Ranges) through the Carnarvon ranges with only 1 record in GVD1. Other flora include *Eremophila* species at Queen Victoria Spring Nature Reserve, *Dampiera ramosa* and *Dicrastylis nicholasii*.

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 (Environmental Protection Authority 1974). Recommendations for reservation by the CTRC in GVD1 (De La Poer Range Nature Reserve and Queen Victoria Springs Nature Reserve) were implemented. The subregion is covered by a CALM Regional Management Plan, published in 1994, that provides an overview of the regions biota, addresses land and conservation issues, but was written to cover a third of WA and therefore was generalised in its attention to detail (Department of Conservation and Land Management 1994b). The reviews and strategies therein (for reserve development or management of weeds, feral animals, fire, mining, ecosystem rehabilitation & disease quarantine) do not address the specific needs of the subregions, or even bioregions, individually.

Wetlands

Wetlands of National significance (DIWA listings)

There are no Wetlands of National Significance identified in the subregion.

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

Name and Code	Location	Description[1]	Special Values[2]	Condition[3]	Trend[4]	Reliability[5]	Threatening Processes[6]
Lake Minigwal	Eastings 520 000, Northings 6730 000, zone 52	B8	ii	iii	iv	i	v (foxes, cats, rabbits and goats, occasional camels), x (de-watering of minesites and discharge of hypersaline water into lake beds (Lake Carey – flows into Lake Minigwal))
Ponton Creek	Major occasional paleodrainage channel from North-East Goldfields to Lake Boonderoo	B2	Unknown	Unknown	Unknown	Unknown	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

Riparian zone vegetation

Name	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
Ephemeral Creek lines	The extent of riparian vegetation is limited and confined to major creek systems which only flow intermittently. (i) degraded on pastoral leases on western edge of subregion, (iv) in remaining area of subregion	iii (declining on pastoral leases), iv (static for remainder of subregion)	ii	iv (grazing pressure on pastoral lease areas in western section of subregion), v (foxes, cats, rabbits & goats), vii, x (de watering of mines, lowering water tables)

[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 GVD1.

Other ecosystems at risk

Ecosystem	Status	NVIS[1]	Condition[2]	Reliability[3]	Trend[4]	Threatening Processes[5]
Yellow sandplain communities of the Great Victoria Desert Very diverse mammalian and reptile fauna, distinctive plant assemblages (D.Pearson pers. comm.)	V	18, 23, 33, 31	ii-iii	ii	iv	iv, v (camel, rabbits, foxes & cats), vii (extensive fires), xii (mining)
Assemblages of Queen Victoria Spring Great Victoria Desert (Burbidge *et al*. 1976)	V	18, 23, 33, 31	ii-iii	ii	iv	iv, v (camel, rabbit), 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)					
Sminthopsis psammophila	V	ii	vi	iii	v (cats, foxes), vii
Notoryctes typhlops	E	ii	vi	ii	v (cats, foxes), vii
Dasycercus cristicauda	V	ii	vi	ii	v (cats, foxes), vii
SCHEDULE 1; RARE/LIKELY TO BECOME EXTINCT, DIV 2 (BIRDS)					
Polytelis alexandrae	E	ii	vi	ii	vii
Acanthiza iredalei	V	ii	vi	ii	v (cats, foxes), vii, iv
Leipoa ocellata	V	Unknown	iii	iii	v (foxes, cats), iii, iv
SCHEDULE 4; OTHER SPECIALLY PROTECTED FAUNA. DIVISION 2 (BIRDS)					
Cacatua leadbeateri	SP	Unknown	vi	Unknown	Unknown threatening processes
SCHEDULE 4; OTHER SPECIALLY PROTECTED FAUNA. DIVISION 3 (REPTILES)					
Aspidites ramsayi	SP	Unknown	vi	Unknown	vii, v (foxes)
OTHER SPECIES AT RISK WITHIN THE SUBREGION					
Lerista puncticauda	P	ii	vi	ii	v (cats, foxes), 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]
DECLARED RARE FLORA					
Caesia rigidifolia	EX	i	i	iii	Presumed extinct due to v (rabbits)
Eucalyptus articulata	EN	ii-iii	iv	iii	Unknown threatening processes, possibly vii?
Conospermum toddii	EN	ii-iii	iv	iii	vii, v (camels, rabbits), iv
Thryptomene wittweri	V	ii-iii	iv	ii	vii, v, iv (goats)
PRIORITY 1					
Dampiera eriantha	1	Unknown	vi	ii	vii, v, iv
Philotheca linearis	1	Unknown	vi	ii	vii, v, iv
Philotheca tubiflora	1	Unknown	vi	ii	vii, v, iv
Thysanotus baueri	1	Unknown	vi	ii	vii, v, iv
PRIORITY 2					
Dicrastylis nicholasii	2	Unknown	vi	ii	vii, v, iv
Grevillea secunda	2	Unknown	vi	ii	vii, v, iv
Isotropis canescens	2	Unknown	vi	ii	vii, v, iv
Malleostemon sp Officer Basin	2	Unknown	vi	ii	vii, v, iv
Micromyrtus stenocalyx	2	Unknown	vi	ii	vii, v, iv
Newcastelia insignis	2	Unknown	vi	ii	vii, v, iv
Olearia arida	2	Unknown	vi	ii	vii, v, iv
Physopsis chrysotricha	2	Unknown	vi	ii	vii, v, iv

[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				L
20	Low woodland; mulga mixed with *Allocasuarina cristata* & *Eucalyptus* sp (e6?)				L
24	Low woodland; *Allocasuarina cristata*				L
45	Shrublands; mallee scrub (Great Victoria Desert)				M
84	Hummock grasslands, open low tree & mallee steppe; marble gum & mallee (*Eucalyptus youngiana*) over hard spinifex *Triodia basedowii* between sandhills	X			L
85	Hummock grasslands, open low tree & mallee steppe; marble gum & mallee (*Eucalyptus youngiana*) over hard spinifex on sandplain	X			M
86	Hummock grasslands, open low tree steppe; mulga, *Allocasuarina cristata* & hard spinifex between sand ridges	X			H
95	Hummock grasslands, shrub steppe; acacia & grevillea over *Triodia basedowii*				L
107	Hummock grasslands, shrub steppe; mulga and *Eucalyptus kingsmillii* over hard spinifex				L
109	Hummock grasslands, shrub steppe; *Eucalyptus youngiana* over hard spinifex	X			H
110	Hummock grasslands, shrub steppe; red mallee over spinifex *Triodia scariosa*	X			L
125	Bare areas; salt lakes				M
128	Bare areas; rock outcrops				L
239	Hummock grasslands, open medium tree & mallee steppe; marble gum (*E. gonglocarpa* & mallee (*Eucalyptus youngiana*) over hard spinifex *Triodia basedowii* between sandhills	X			M
251	Low woodland; mulga & *Allocasuarina cristata*				L
289	Succulent steppe; saltbush & bluebush				L
389	Succulent steppe with open low woodland; mulga over saltbush				H
441	Succulent steppe with open low woodland; mulga & sheoak over bluebush	X	X		L
444	Hummock grasslands, open low tree steppe; mulga over *Triodia scariosa*				M
467	Mosaic: Medium woodland; salmon gum & gimlet/Hummock grasslands, mallee steppe; red mallee over spinifex *Triodia scariosa*				L
676	Succulent steppe; samphire				L
936	Medium woodland; salmon gum				L
1239	Hummock grasslands, open medium tree & mallee steppe; marble gum & mallee (*E. youngiana*) over hard spinifex *Triodia basedowii* on sandplain				H
1446	Succulent steppe with scrub; mulga over bluebush				M
4621	Shrublands; mallee scrub, *Eucalyptus eudesmioides*				H
	Yellow sandplain communities of the Great Victoria Desert Very diverse mammalian and reptile fauna, distinctive plant assemblages (D.Pearson pers. comm.)	X			H
	Assemblages of Queen Victoria Spring Great Victoria Desert (Burbidge *et al*. 1976)	X			M

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

Other Subregional Constraints: These are primarily resource related in terms of management.

Competing Land Uses: In particular prospective exploration and mining leases and to a minor extent pastoral values.

Bioregional and subregional priority for reserve consolidation

Overall 9.4% of the Great Victoria Desert is reserved in IUCN I-IV reserves and the bioregion is IBRA reservation Class 5 (i) (see Appendix D, and Appendix C, rank 4). GVD1 has 7.8%, GVD2 has 10.3%, and GVD3 has 8.4% areas within IUCN I-IV reservations. Threatening processes exist (such as changed fire regimes, feral predators, feral herbivores, mining interests and inadequate knowledge). Subregional bias is minimal with 7.8% of GVD1 and 35% of GVD1 vegetation systems in IUCN reserves. GVD1 is considered Class 4.

Reserve management standard

The Reserve Management Standard for GVD1 is (ii) Fair (see Appendix C, rank 5), indicating that biodiversity values and management issues poorly identified, resource degradation is occurring though retrievable. Some feral predator control through aerial dog baiting programs, but this is limited to pastoral areas. Wildfire management is non–existent and impact of feral herbivores is unknown. Mining exploration activities are supervised.

Class	Purpose	Name	Category	Reserve Management[1]
A	Conservation of Flora and Fauna	Queen Victoria Spring Nature Reserve	Nature Reserve	ii-iii
A	Conservation of Flora and Fauna	Plumridge Lakes Nature Reserve	Nature Reserve	ii-iii
C	Conservation of Flora and Fauna	De La Poer Range Nature Reserve	Nature Reserve	ii-iii

[1]Appendix C, rank 5

Off reserve conservation

Priority species or groups and existing recovery plans

Species	Specific Recovery Plan	General Recovery Plan
Eucalyptus articulata	No	No
Conospermum toddii	No	No
Thryptomene wittweri	No	No
Polytelis alexandrae	No	Action Plan for Australian Birds
Acanthiza iredalei	No	Action Plan for Australian Birds
Leipoa ocellata	Yes - Malleefowl Preservation Group have current Action Plan and ongoing research	Action Plan for Australian Birds
Sminthopsis psammophila	Yes - RP	Action Plan for Australian Marsupials and Monotremes
Notoryctes typhlops	No	Action Plan for Australian Marsupials and Monotremes
Dasycercus cristicauda	Yes – Draft RP, National Threatened Species Recovery team.	Action Plan for Australian Marsupials and Monotremes
Lerista puncticauda	No	Action Plan for Australian Reptiles

Appropriate species recovery actions

For GVD1, fire management (ix) is needed to reduce the impact of large intense, summer wildfires on biota. Further research (xii) required in determining species status and distribution, and gain increased knowledge of subregion. Feral animal control (vii) would assist with CWR species recovery. Research into fire ecology of vertebrates in GVD1 could assist in management at the subregional level.

Species	Recovery Actions[1]	Recovery Descriptions
Eucalyptus articulata	i, iii, ix, xii	Habitat retention through reserves and protection on other state lands. Research to confirm status and species requirements. Fire management may be a requirement.
Conospermum toddii	i, iii, ix, xii, vii	Habitat retention through reserves and protection on other state lands. Research to confirm status and species requirements. Fire management and feral grazing animal control may be necessary.
Thryptomene wittweri	i, iii ix, xii, vii	Habitat retention through reserves and protection on other state lands. Research to confirm status and species requirements. Fire management and feral grazing animal control may be necessary.
Dasycercus cristicauda	iii, vii, ix, xii	Habitat protection on other state lands, further research into the species ecology. Feral predator control and fire management are important.
Notoryctes typhlops	iii, vii, ix, xii	Habitat protection on other state lands, further research into the species ecology. Feral predator control and fire management are important
Sminthopsis psammophila	iii, vii, ix, xii	Habitat protection on other state lands, further research into the species ecology. Feral predator control and fire management are important
Polytelis alexandrae	ix, xii	Further research into species ecology and habitat requirements is needed. Fire management may be necessary
Acanthiza iredalei	vii, ix, xii	Feral predator control important, further research into species ecology and habitat requirements is needed. Fire management may be necessary
Lerista puncticauda	xii, ix, vii	Research on the species ecology is required. Fire management and feral animal control may also be important.

[1]Appendix B, key h.

Ecosystems and existing recovery plans

Ecosystem	Specific Recovery Plan	General Recovery Plan
Yellow sandplain communities of the Great Victoria Desert	No	No
Assemblages of Queen Victoria Spring	No	No

Appropriate ecosystem recovery actions

Ecosystem	Recovery Actions[1]	Recovery Descriptions
Yellow sandplain communities of the Great Victoria Desert	i, iii, ix, vii, xii	Habitat retention through reservation or protection on other state lands. Fire management, feral animal control and further research are additional requirements.
Assemblages of Queen Victoria Spring	i, iii, ix, vii, xii	Habitat retention through reservation or protection on other state lands. Fire management, feral animal control and further research are additional requirements.

[1]Appendix B, key h.

Subregion priority for off reserve conservation

The priority for off park conservation is (iv) (see Appendix C, rank 6), indicating that limited off park measures are required, capacity exists and some achieved biodiversity gains. There are no major conflicting land uses as much of GVD1 is UCL, Aboriginal Reserve or Conservation Reserve. Mineral exploration and possible mine establishment and pastoral activities are considered the main conflicting land use. Mining companies own many of the pastoral leases and levels of stocking are reduced.

Conservation actions as an integral part of NRM

Existing NRM actions

Industry Codes of Practice: Particularly for the mining industry.

Feasible opportunities for NRM

Legislation: Including duty of care for leasehold and other lands.

Threat Abatement Planning as Part of NRM: e.g. vegetation and threatened species management plans, pest management, fire management plans.

Capacity Building Required With Community, Landholders, Industry and Institutions

Impediments or constraints to opportunities

A number of impediments exists including the Land Administration Act and the operations of the Pastoral Land Board, Conservation Through Reserve is limited through mining leases and tenements. There is a need to increase awareness of conservation values through education of various industries (particularly mining, pastoral) and the public in general. Limited financial resources are also a major constraint.

Subregions where Specific NRM actions are a priority to pursue

The NRM priority for GVD1 is (iv) (see Appendix C, rank 7) NRM instruments 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: Regolith mapping is unavailable at better than 1:250000 resolution.

Systematic Fauna Survey: There has been no systematic biological survey of the subregion although there has been some assessment of biota, McKenzie and Burbidge (1979) who compiled a basic species inventory for a number of reserves and proposed reserves. There have been a number of localised studies with some being both intensive and long term. This particularly relates to work on reptile ecology by Eric Pianka to the east of Laverton (Pianka 1996) and unpublished work on the fire ecology of vertebrates in the Queen Victoria Springs Nature Reserves by David Pearson (1994), CALM. The latter study has focused on Queen Victoria Spring Nature Reserve and has been running for more than 10 years. Some surveys for Sandhill Dunnarts have been undertaken by Glenn Gaikhorst and co-workers to the north of Queen Victoria Spring Nature Reserve.

Floristic Data: Pearson (1994) submitted a MSc thesis on the vegetation and flora of Queen Victoria Spring Nature Reserve but there is little fine scale floristic data available for the subregion as a whole.

Ecological and Life History Data: Reports on the ecological requirements and a recovery plan have been produced for the Sandhill Dunnart (Churchill 2001). There is little data on habitat requirements of virtually all invertebrate species, most ephemeral plants, persisting CWR mammals and uncommon vertebrate and plant species. There is no data to provide regional context on life history (including population trend) of any species.

Other Priority Data Gaps Include:

- No quantitative data on the affect of exotic predators, introduced herbivores or weed colonisation.

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 (*Dasycerus cristicauda*)	Conservation Commission of the Northern Territory	O
090	Benshemesh, J.	(2000).	National Recovery Plan for Malleefowl.	Department of Environment and Heritage, South Australia.	R
171	Churchill, S.	(2001a).	Recovery Plan for the Sandhill Dunnart (*Sminthopsis psammophila*).	National Parks and Wildlife SA and Natural Heritage Trust. Adelaide.	R
181	Cogger, H., Cameron, E., Sadlier, R. and Eggler, P.	(1993).	The Action Plan for Australian Reptiles.	Australian Nature Conservation Agency, Canberra.	R
231	Department of Conservation and Land Management	(1994b).	Goldfields Region Management Plan 1994-2004. Management Plan No. 27.	Department of Conservation and Land Management.	R

271	Environmental Protection Authority	(1974).	Conservation Reserves in Western Australia - Report of the Conservation through Reserves Committee to the Environmental Protection Authority "CTRC Green Book".	Environmental Protection Authority, Perth.	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
490	McKenzie, N.L. and Burbidge, A.A. (eds)	(1979).	The Wildlife of some existing and proposed reserves in the Gibson, Little Sandy and Great Victoria deserts.	Western Australian Wildlife Research Bulletin 8.	J
547	Pearson, D.J.	(1994).	The vegetation and Flora of Queen Victoria Spring Nature Reserve.	Unpublished MSc thesis.	R
552	Pianka, E.R.	(1996).	Long-Term Changes in Lizard Assemblages in the Great Victoria Desert, Dynamic Habitat Mosaics in Response to Wildfires.	Academic Press.	B

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

Other relevant publications

See reference numbers 040, 062, 075, 081, 098, 101, 107, 133, 167, 172, 241, 268, 278, 306, 370, 561, 685 and 686 in Appendix A.