

Coolgardie 1 (COO1 – Mardabilla subregion)

MAL GRANT, SARAH COMER, SANDRA GILFILLAN, KLAUS TIEDEMANN AND SARAH BARRETT
JANUARY 2002

Subregional description and biodiversity values

Description and area

The Coolgardie Bioregion is comprised of granite strata of the Yilgarn Craton with Archaean Greenstone intrusions in parallel belts. Drainage is occluded. Mallees and shrublands on sandplains are associated with lateritised uplands, playas and granite outcrops. Diverse woodlands are rich in endemic eucalypts, on low greenstone hills, valley alluvials and broad plains of calcareous earths. In the west, the shrublands are rich in endemic Proteaceae, in the east they are rich in endemic acacias. The climate is arid to semi-arid Warm Mediterranean.

The Mardabilla subregion is an Eocene marine limestone plain, on a granite basement in its western parts. Red-brown loams and aeolian sands over sheet and nodular kankar. *Eucalyptus* woodland over broomebush/greybush, bluebush and saltbush. The climate is arid, with 250-300 mm of rainfall during winter and subregional area is 2, 190, 244 ha.

Dominant land use

Mainly (vii) grazing - improved pasture (see Appendix B, key b) & (iv) cultivation - dry-land agriculture, with lesser areas of (xiii) conservation, (xi) UCL and Crown reserves, (xiv) roads and other easements, (v) forestry plantation.

Continental Stress Class

The Continental Stress Class for COO1 is 5.

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

Rare Features:

- Vertebrates include Malleefowl (*Leipoa ocellata*), Slender-billed Thornbill (*Acanthiza iredalei iredalei*), Southern Hairy-nosed Wombat (*Lasiorhinus latifrons*) and the Crested Shrike-tit (*Falcunculus frontatus*).
- Some threatened flora persist in COO1, including *Eremophila denticulata*.

Centres of Endemism:

- Areas in northern half of Cape Arid National Park and Dundas Nature Reserve may be described as centres of endemism.
- Caves are likely to be centres of endemism.

Refugia:

Caves are likely to be refugia for invertebrates.

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 Wheatbelt in the CTRC Green Book. Some, but not all of these recommendations (with modification) were implemented over the following ten years. The subregion is covered by the Department of Conservation and Land Management South Coast Regional Management Plan (1992) that provides an overview of biota, addresses land and wildlife conservation issues, but was generalised in its attention to detail and there is little information on the biota of COO1 contained within. Therefore, 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 the subregion, or even the bioregion. The South Coast Macro Corridor Project (Watson and Wilkins 1999) identifies areas in COO1 where improved landscape connectivity will benefit biodiversity conservation.

Wetlands

Wetlands of National significance (DIWA listings)

There are no wetlands of national significance listed in COO1.

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

There are no known wetlands of subregional significance in COO1.

Riparian zone vegetation

There are no riparian zones in COO1.

Ecosystems at risk

Threatened Ecological Communities (TECs)

There are no Threatened Ecological Communities (TECs) in COO1.

Other ecosystems at risk

Beard Veg Assoc	Ecosystem Description	Status	NVIS ¹	Condition ²	Trend ³	Reliability ⁴	Threatening Processes ⁵
467	Mosaic: Medium woodland; salmon gum & gimlet/Hummock grasslands, mallee steppe; red mallee over spinifex <i>Triodia scariosa</i>		18	Unknown	vi	Unknown	Unknown threatening processes though grazing is likely.
514	Shrublands; mallee scrub, white mallee (<i>Eucalyptus cooperiana</i>)		27	Unknown	vi	Unknown	Unknown threatening processes though grazing is likely.
214	Mosaic: Medium woodland; goldfield eucalypts/Succulent steppe with open low woodland; myoporum over saltbush		8	Unknown	vi	Unknown	Unknown threatening processes though grazing is likely.
4641	Succulent steppe with open woodland; salmon gum & gimlet over bluebush		31, 8	Unknown	vi	Unknown	Unknown threatening processes though grazing is likely.
515	Shrublands; mallee scrub, blue mallee (<i>Eucalyptus socialis</i>)		27	Unknown	vi	Unknown	Unknown threatening processes though grazing is likely.
925	Shrublands; mallee scrub, red mallee		27	Unknown	vi	Unknown	Unknown threatening processes though grazing is likely.
122	Succulent steppe with open low woodland; <i>Acacia papyrocarpa</i> over saltbush & bluebush,		22	ii	ii	iii	v (rabbits), vii, iv
500	Mosaic: Medium woodland; merrit & red mallee/Shrublands; dodonaea scrub		29	i	iii	iii	vi, iv, vii
1241	Succulent steppe; bluebush		39	ii	iii	iii	v (rabbits), vii, iv
221	Succulent steppe; saltbush		39	ii	iii	iii	v (rabbits), vii, iv

¹Appendix B, key f; ²Appendix C, rank 2; ³Appendix C, rank 3; ⁴Appendix C, rank 1; ⁵Appendix 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 2 (BIRDS)					
<i>Acanthiza iredalei iredalei</i>	V	Unknown	vi	iii	iv, ii
<i>Leipoa ocellata</i>	V	Unknown	vi	ii	v (foxes, cats rabbits)

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

Declared rare and priority flora

Species	Status	Condition ¹	Trend ²	Reliability ³	Threatening Processes ⁴
<i>Eremophila denticulata</i>	V	Unknown	vi	ii	vii

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

Analysis of appropriate management scenarios

Reservation priorities of ecosystems

Beard Veg Assoc	Ecosystem Description	IUCN Reserves	Non-IUCN Reserves	Priority
10	Medium woodland; red mallee group			
122	Succulent steppe with open low woodland; <i>Acacia papyrocarpa</i> over saltbush & bluebush,			
125	Bare areas; salt lakes	X		
214	Mosaic: Medium woodland; goldfield eucalypts/Succulent steppe with open low woodland; myoporum over saltbush			
221	Succulent steppe; saltbush			
467	Mosaic: Medium woodland; salmon gum & gimlet/Hummock grasslands, mallee steppe; red mallee over spinifex <i>Triodia scariosa</i>			
482	Medium woodland; merrit & red mallee	X		
487	Medium woodland; redwood & red mallee (<i>E. oleosa</i>)	X		
500	Mosaic: Medium woodland; merrit & red mallee/Shrublands; dodonaea scrub			
514	Shrublands; mallee scrub, white mallee (<i>Eucalyptus cooperiana</i>)	X?		
515	Shrublands; mallee scrub, blue mallee (<i>Eucalyptus socialis</i>)	X		
519	Shrublands; mallee scrub, <i>Eucalyptus eremophila</i>			
925	Shrublands; mallee scrub, red mallee	X		
1241	Succulent steppe; bluebush	X		
4641	Succulent steppe with open woodland; salmon gum & gimlet over bluebush			

Subregional constraints in order of priority

(see Appendix B, key g)

Irreplacibility, Economic Constraints and Competing

Land Uses: Major components of the landscape are covered by mines, mining tenements or exploration leases and to a lesser extent grazing.

Bioregional and subregional priority for reserve consolidation

COO1 is Reservation Class 3 (> 30% of native vegetation cover remaining) (see Appendix D, and Appendix C, rank 4).

Reserve management standard

Many COO1 reserves are becoming saline. Wildfire management facilities are limited by resources, except for fire breaks and fire-access tracks that are installed and maintained. Feral herbivore grazing activities are now minimal (e.g. Callicivirus has reduced rabbit populations, and there are few goats in the subregion), and feral predator controls are not carried out. The overall Reserve Management Standard Rank is (i) poor (see Appendix C, rank 5).

Class	Purpose	Name	Category	Reserve Management Rank ¹
A	National Park	Cape Arid National Park	National Park	ii – iii
A	Primitive Area for the Preservation and Study of Flora, Fauna, Geological and Anthropological Features	Nuytsland Nature Reserve	Nature Reserve	i – ii
B	Conservation of Flora & Fauna	Dundas Nature Reserve	Nature Reserve	ii – iii

¹Appendix C, rank 5

Off reserve conservation

Priority species or groups and existing recovery plans

Species	Specific Recovery Plans	General Recovery Plans	Prioritise for Subregion
<i>Eremophila denticulata</i>	No	Goldfields Regional Management Plan	iii
<i>Acanthiza iredalei iredalei</i>	No (This species is known to associate with chenopod shrubland)	Action Plan for Australian Birds; Goldfields Regional Management Plan	
<i>Leipoa ocellata</i>	Yes - Malleefowl Preservation Group have current Action Plan and ongoing research	Action Plan for Australian Birds; Goldfields Regional Management Plan	

Appropriate species recovery actions

Species	Recovery Actions ¹	Recovery Descriptions
<i>Eremophila denticulata</i>	iii, ix, xiv	Habitat protection on other state lands. Fire Management. Other – Installation of roadside markers.
<i>Acanthiza iredalei iredalei</i>	xii, xiii	Research to determine the effects of sheep and rabbits; the ability of the subspecies to recolonise isolated habitats; determine past and present distribution. Capacity building to develop management guidelines for preferred habitat; Maintain and or establish habitat corridors between patches of suitable habitat; Conduct public education program among land managers to encourage the adoption of management guidelines.
<i>Leipoa ocellata</i>	vii, v, xi, ix, xii, x, xiii, xiv	Feral animal control (foxes, sheep, goats, rabbits). Fencing of habitat remnants to exclude stock. Support initiatives to reduce further salinisation. Fire management to reduce the incidence of large fires and discourage broadscale burning for agricultural purposes. Research –Population size and distribution, breeding, longevity, and survey techniques. Translocations and captive breeding. Capacity building with community groups, schools and farmers; Maintain and or establish habitat corridors between patches of suitable habitat. Other – Prepare regional conservation plans and manage the recovery process.

¹Appendix B, key h.

Ecosystems and existing recovery plans

Ecosystem	Specific Recovery Plans	General Recovery Plans
Banded ironstone range plant communities	No	Goldfields Regional Management Plan

Appropriate ecosystem recovery actions

Ecosystem	Recovery Actions ¹	Recovery Descriptions
Banded ironstone range plant communities	i, ii, iii, xiii	Habitat retention through reserves or on other State lands or by on private lands. Capacity building required with industry.

¹Appendix B, key h.

Subregion Priority for Off Reserve Conservation

The subregional priority for off reserve conservation is (iv) (see Appendix C, rank 6), indicating that limited off park measures are required.

Conservation actions as an integral Part of NRM

Existing NRM actions

Incentives: Tax deductions for fencing on pastoral leases

Legislation: Pastoral Act has regulations on stocking rates, Wildlife Conservation Act, Sandalwood Act, Mining Act, Soil Conservation Act, Right to Water and Irrigation Act, Bush Fires Act, Agricultural and Related Resources Protection Act and the Environmental Protection Act.

Threat Abatement Planning: Vegetation management plans; pest management; feral animal control; Kangaroo shooting; Dingo baits; Callicivirus control of rabbit populations

Environmental Management Systems: Interim Management Guidelines only.

Capacity Building: The Macro Corridor project is used as a tool to be used to identify strategic landscape level connectivity.

Other Planning Opportunities: e.g. South Coast Regional Integrated Planning Team (SCRIPT); Bushfire control program.

Feasible opportunities for NRM

Legislation: Review of Wildlife Conservation Act necessary to strengthen protection of biodiversity in relation to mining, pastoral or other activities.

Institutional Reform: Industry reconstruction – pastoral activities in arid woodlands and savannah areas are of marginal value compared to their potential environmental impacts and should be critically reviewed.

Environmental Management Systems: Marginal woodlands and transitional areas need greater representation in the conservation estate through the creation of large nature reserves in this sub-division.

Capacity Building: Closer liaisons need to be developed with community groups and land holders on issues, e.g. pastoral industry. The Macro Corridor project can be used as a tool to identify strategic landscape level connectivity. Responses to bushfires need to be better coordinated.

Other Planning Opportunities: The Department of Conservation and Land Management South Coast Regional Management Plan N^o 24 (1992-2002) recommends that two major extensions of Nuytsland nature Reserve be made, between the northern boundary of the reserve and the Eyre Highway. One block is

centered north of Point Culver; the other is north and west of Red Rocks Point and south of Madura (draft proposal DS9). These proposals resulted from the recommendations of the Biological Survey of the Nullarbor Region South and Western Australia in 1984 (McKenzie and Robinson 1987).

Impediments or constraints to opportunities

The remoteness and absence of infrastructure in much of the subregion will add to costs of implementation an ongoing management of any NRM initiatives however this should not be a deterrent to their implementation. The terms of Native Title agreements (and future settlements) are likely to have profound implications for NRM actions in the future and the legal and administration issues are likely to be complex.

Subregions where specific NRM actions are a priority to pursue

Significant constraints exist to integrate conservation as part of a production or development system apply in particular to the pastoral industry and protection of flora communities. Effective rabbit control also remains a challenge to natural land managers as numbers have received only a temporary check from Rabbit Callicivirus.

NRM rank is 3 (see Appendix C, rank 7) indicating that instruments are in place with some achieved biodiversity outcomes. A more coordinated approach between the agencies responsible for conservation, pastoral and mining activities on land use proposals to minimise environmental impacts would be highly desirable.

Data gaps

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

Vegetation and Regional Ecosystem Mapping: No regolith mapping available. Vegetation map resolution is 1:250 000 at best.

Systematic Fauna Survey: Sparse point-based fauna survey focusing on vertebrates and flora of the main landform units has been carried out. Additional points in the landscape, as well as an array of invertebrate taxa, need to be sampled. The sparsity of data applies both on and off nature conservation estate.

Floristic Data: Systematic quadrat-based flora survey. Most reserves don't have long-term survey data on species presence or absence; data is confined to specific threatened flora, and a few large reserves. No funding for ongoing monitoring of stratified set of LTERM quadrats currently being sampled across the subregion.

Ecological and Life History Data: There is little data on habitat requirements of virtually all invertebrate species, most ephemeral plants (except some DRF), persisting Endangered or Vulnerable birds and uncommon vertebrate and plant species. There is no data to provide a regional context on life history (including

population-trend) of most species.

- No quantitative data on the affect of exotic predators, weed colonisation, fragmentation & farm clean-up, fire, and potential affects of mining (currently exploration) on undisturbed native vegetation.

Other Priority Data Gaps Include:

Sources

References cited

No.	Author	Date	Title	Publication Details	Pub. Type
090	Benshemesh, J.	(2000).	National Recovery Plan for Malleefowl.	Department of Environment and Heritage, South Australia.	R
230	Department of Conservation and Land Management	(1992).	South Coast Region Regional Management Plan 1992-2002. Management Plan No. 24.	Department of Conservation and Land Management.	O
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
298	Garnett, S.T. and Crowley, G.M.	(2000).	The Action Plan for Australian Birds.	Environment Australia, Canberra.	R
489	McKenzie, N.L. and Robinson, A.C. (eds)	(1987).	A Biological Survey of the Nullarbor Region South and Western Australia in 1984.	South Australian Department of Environment and Planning, Western Australian Department of Conservation and Land Management and Australian National Parks and Wildlife Service.	B
675	Watson, J and Wilkins, P.J.	(1999).	The Western Australian South Coast Macro Corridor Project - A bioregional Strategy for Nature Conservation.	Parks 9(3): 7-16.	J

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

Other relevant publications

See reference numbers 005, 014, 045, 046, 101, 118, 272, 273, 278, 307, 331, 340, 354, 409, 410, 485, 587 and 696 in Appendix A.