Geraldton Sandplains 2 *(GS2 - Geraldton Hills subregion)*

ANTHONY DESMOND AND ALANNA CHANT
NOVEMBER 2001

Subregional description and biodiversity values

Description and area

The Geraldton Sandplains bioregion comprises mainly proteaceous scrub-heaths, rich in endemics, on the sandy earths of an extensive, undulating, and lateritic sandplain mantling Permian to Cretaceous strata. Extensive York Gum and Jam woodlands occur on outwash plains associated drainage. The Geraldton Hills subregion (GS2) incorporates the southern end of Carnarvon Basin and northern end of the Perth Basin, with exposed areas of Permian / Silurian siltstone and Jurassic sandstones, mostly overlain by sandplains, alluvial plains, and coastal limestones. Sand heaths with emergent *Banksia* and *Actinostrobus*, York Gum woodlands on alluvial plains, proteaceous heath and *Acacia* scrubs on limestones depending on depth of coastal-sand mantle, low closed forest of *Acacia rostellifera* (now cleared) on alluvial plains of Greenough and Irwin River (behind beach dune system south of Geraldton). Also includes the Pinjarra Orogen which is an area of Hill country with a Proterozoic basement, and comprises extensive, undulating, lateritic uplands mantled in sandplain supporting proteaceous shrublands and mallees while valleys support York Gum and Jam. Warm semi-arid to Mediterranean climate with 400 – 500 mm of rainfall annually, and the subregional area is 2, 242, 033 ha.

Dominant land use

The dominant land use is mainly (iv) dry-land agriculture (65.78%), with lesser areas of (xiii) conservation (13.84%), (viii) grazing native pastures (13.21%) and (x) UCL and Crown reserves (6.47%) (see Appendix B, key b).

Continental Stress Class

The Continental Stress Class for GS2 is currently listed as 4, however it should be 2 or worse. Most of GS2 is in a similar situation to Avon Wheatbelt, but the northern periphery is slightly better as it includes parts of Kalbarri National Park, Wandana Nature Reserve & Unallocated Crown Land. Over 68% of the area in conservation estate in this subregion is contained in Kalbarri National Park at the far north-western periphery of the subregion. Wandana Nature Reserve in the north-eastern periphery contains over 20% of the conservation estate of the subregion. The remainder of the subregion has very few reserves, the majority of which are small and on agriculturally unproductive land. Many reserves are threatened by salinity.

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

Rare Features:

- *Acacia rostellifera* forest
- Hutt Lagoon samphire communities
- Houtman Abrolhos islands with Tammar population, rare breeding seabirds and sea lion colonies
- Moresby Range communities with rare plants such as the mallee species *Eucalyptus blaxellii*, *Eucalyptus cuprea*, heath *Drummondita ericoides* and orchid *Caladenia hoffmanii* subsp. *hoffmanii.*

Threatened Vertebrates:

- CWR mammals such as Tammar Wallaby (*Macropus eugenii derbianus*), Black-footed Rock-wallaby (*Petrogale lateralis lateralis*), Northern Brushtail Possum (*Trichosurus vulpecula*), and Western Brush Wallaby (*Macropus irma*).
- Birds such as: Peregrine Falcon (*Falco peregrinus*), Red-tailed Tropicbird (*Phaethon rubricauda*), Malleefowl (*Leipoa ocellata*), *Anous tenuirostris melanops*, Carnaby`s Cockatoo (*Calyptorhynchus latirostris*).
- Reptiles such as: Spiny-tailed Skink (*Egernia stokesii stokesii*), Carpet Python (*Morelia spilota imbricata*).

Ecosystem Types Which Have at Least 85% of Their Total Extent Confined to GS2:

Beard Veg Assoc	Description
35	Shrublands; jam scrub with scattered York gum
351	Shrublands; mallee & acacia scrub with scattered York gum & red mallee
353	Shrublands; mallee & acacia scrub with scattered York gum
359	Shrublands; acacia & banksia scrub
371	Low forest; *Acacia rostellifera*
Beard Veg Assoc	Description
372	Mosaic: Shrublands; scrub-heath on deep sandy flats/Shrublands; thicket, acacia-casuarina alliance

380	Shrublands; scrub-heath on sandplain
386	Low woodland; York gum
401	Mosaic: Shrublands; scrub-heath on coastal association on yellow sandplain/Shrublands; acacia patchy scrub
402	Shrublands; heath on coastal limestone
403	Shrublands; *Acacia ligulata* scrub-heath
407	Low woodland over scrub; *Allocasuarina huegeliana* over jam scrub
408	Shrublands; scrub-heath on coastal association, yellow sandplain
424	Shrublands; York gum mallee scrub
427	Shrublands; jam scrub with scattered *Allocasuarina huegeliana* & York gum
431	Shrublands; *Acacia rostellifera* open scrub
440	Shrublands; *Acacia ligulata* open scrub
675	Shrublands; mixed thicket (melaleuca & hakea?)
1141	Shrublands; jam, *Acacia rostellifera* & *Melaleuca megacephala* thicket
1142	Shrublands; *Acacia ligulata* & *Melaleuca uncinata* dominated thicket on dark brown loamy soil

Centres of endemism:
The region is rich and diverse in flora with many sandplain genera having a high degree of endemism, e.g. *Scholtzia* spp. having over 16 taxa endemic to the subregion. The reptiles *Lerista yuna*, *Cyclodomorphus branchialis*, *Aprasia* sp. nov aff. *fusca* are endemic to the subregion.

Refugia:
Abrolhos Islands provide refugia for breeding Seabirds, Tammar Wallabies (*Macropus eugenii derbianus*), Australian Sea lions (*Neophoca cinerea*), Carpet Pythons (*Morelia spilota imbricata*), and Spiny-tailed Skink (*Egernia stokesii stokesii*) from introduced predators.

High Species and Ecosystem Diversity:
- Sandplain shrublands on Moresby Range - Diverse flora including a number of different ecosystem types (e.g. Mesa tops, west facing slopes, East facing slopes).
- Sandplain shrublands of Burma Rd area - Diverse flora including a number of Endangered and Rare species.
- Kalbarri National Park contains over 1070 floral taxa (a mix of south-western and more arid species). Many of these are endemic to the subregion.

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 Geraldton Sandplains (System 5) in the CTRC Green Book (Environmental Protection Authority 1974). In 1976 these recommendations were further developed by the Environmental Protection Authority as the Red Book recommendations Environmental Protection Authority 1976). Some but not all of these recommendations (with modification) were implemented over the following ten years. No other systematic assessment of biodiversity has been undertaken in the subregion.

Wetlands

Wetlands of National significance (DIWA listings)

Name and Code	Description[1]	Condition[2]	Trend[3]	Reliability[4]	Threatening Processes[5]
Hutt Lagoon System WA035 (GS001WA)	B8, B6, B12, B10	ii	iii	iii	iv, x (rising watertable), vi (wild oats, lupins), xiii (potential for expansion of Dunaliella ponds)
Murchison River (Lower Reaches) WA037 (GS003WA)	A6, B1, B2	ii	iii	iii	iv, vi (saffron thistle, wild oats), x (increased sediment load), xii (historical lead mining operations)

[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 and Code	Location	Description[1]	Special Values[2]	Condition[3]	Trend[4]	Reliability[5]	Threatening Processes[6]
Greenough River pools	300 000 mE, 6 810 000mN	B2	iv	i	ii	ii	ix, x (occluding with sand)
Freshwater springs in Northampton area	235 000 mE, 6 880 000 mN	B17	v	iii	iv	ii	x (increase in discharge though water is fresh currently), iv, vi (glossy nightshade, saffron thistle, soursob, lupins, wild oats)

[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]
Greenough River	i	iii	ii	ix, x (increased flow), i (historical), ii (historical), iv, v (foxes, rabbits & goats), vi (castor oil bush, box thorn, wild oats, soursob, lupins), xi, xii (urbanisation, recreation and tourism)
Chapman River	i	iii	ii	ix, x (increased flow), i (historical), ii (historical), iv, v (foxes, rabbits & goats), vi (castor oil bush, box thorn, pattersons curse, wild oats, soursob, lupins, pennisetum, star thistle), xi, xii (urbanisation, recreation and tourism)
Irwin River	i	iii	ii	ix, x (increased flow), i (historical), ii (historical), iv, v (foxes, rabbits & goats), vi (castor oil bush, box thorn, wild oats, soursob, lupins), xi, xii (urbanisation, recreation and tourism)
Lower Murchison River	ii	iii	ii	ix, x (increased flow), i (historical), ii (historical), iv, v (foxes, rabbits & goats), vi (castor oil bush, box thorn, wild oats, soursob, lupins), xi, xii (urbanisation, recreation and tourism)
Bowes River	i	iii	ii	iv, ix, x, xii, xi (lead contamination from Nokenina Brook Northampton), vi (grasses, box thorn, star thistles), v (pigs, cats, foxes and rabbits), iii
Buller River	iii (uncleared areas), ii (elsewhere)	iii	ii	ix, x, vi (star thistle, grasses, lupins, radish, pattersons curse), iv, v (pigs, cats, foxes and rabbits)
Lower Hutt River	iii	iii	ii	iii, xii (recreation), iv, v (goats and pigs), vi, vii, ix, xi (agricultural chemicals)

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

Wetlands, estuarine and river systems often contained sites of significance to the Aboriginal community.

Ecosystems at risk

Threatened Ecological Communities (TECs)

Community	Status	NVIS[1]	Condition[2]	Trend[3]	Reliability[4]	Threatening Processes[5]
Acacia rostellifera low forest with scattered *Eucalyptus camaldulensis* on Greenough River Alluvial Flats (Beard 1976e, Beard 1976g)	CR	14	i	iii	iii	xi, ix
Clay Flat assemblages of the Irwin River (Beard 1976e)	E PD	14	i	i	iii	ii, iv, v (rabbits), vii

(Presumed Totally Destroyed)

[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

Other ecosystems at risk

Community	Status	NVIS[1]	Condition[2]	Trend[3]	Reliability[4]	Threatening Processes[5]
Melaleuca megacephala and *Hakea pycnoneura* thicket on stony slopes of Moresby Range (Beard 1976g, G. Keighery and N. Gibson pers. comm.)	V	32	ii	iv	ii	ii, iv, v (rabbits), vii
Eucalyptus macrocarpa over Proteaceous sandplain community (M. Fitzgerald pers. comm.)	V	29	ii	ii	i	ii, iv, v (rabbits), vii
Plant assemblages of the Irwin River Headwater flats (Beard 1976e)	V	28	i	iii	ii	x (increased flow), ii, iv, v (rabbits), vii
Plant assemblages of Hutt Lagoon (G. Keighery pers. comm.)	V	39	ii	iii	ii	ix, x (increased water table)
Verticordia dominated low heath on Moresby Range (Beard 1976e, G. Keighery and N. Gibson pers. comm.)	V	29, 30	ii	iv	ii	ii, iv, v (rabbits), vii
Allocasuarina campestris and *Melaleuca uncinata*	V	28	ii	iv	ii	ii, iv, v (rabbits), vii

thicket on superficial laterite on Moresby Range (Beard 1976e, G. Keighery and N. Gibson pers. comm.)						
Eucalyptus mallee sp. and *Acacia* scrub with scattered *E. loxophleba* (Hopkins *et al.* 1996)	V	8	ii	vi	iv	ii, iv, v (rabbits), vii
Acacia rostellifera low forest (Hopkins *et al.* 1996)	V	14	ii	iii	iv	ii, iv, v (rabbits), vii
Vegetation of Gorges of Murchison River lower reaches. Includes Endangered flora such as *Drakaea concolor, Caladenia wanosa, Lechenaultia chlorantha,* and *Hypocalymma longifolium*. Vulnerable flora such as *Calytrix harvestiana, Malleostemon* sp. Kalbarri, *Murchisonia fragrans*.	V	9	i	ii	i	v (goats, pigs), vi (saffron thistle, wild oats, lupins) x (increased flow affecting riparian vegetation)
Vegetation of the Northampton block - Beard's Hutt System. Vegetation type species rich and appears different, reservation rate extremely low, 3 Critically Endangered, 3 Endangered and 8 Vulnerable flora species occur in the area.	V	Various	ii	iii	ii	v (goats, pigs, rabbits), vi (saffron thistle, wild oats, lupins)
Burma Rd Sandplain. Species rich proteaceous sandplains communities containing 3 endangered flora, 7 vulnerable flora.	V	30	ii	iii	i	v (goats, pigs, rabbits), vi (saffron thistle, wild oats, lupins)
Critical weight range mammals (extant species) *Trichosurus vulpecula hypoleucus, Macropus eugenii derbianus, Macropus irma;* locally extinct species *Parantechinus apicalis, Dasyurus geoffroii, Isoodon obesulus, Petrogale lateralis lateralis*.	E	NA	i	ii - iii	iii	v (fox, cat), vii, iv
Houtman Abrolhos islands mangrove communities (including seabird nesting sites and Australian Sea lion nursery sites)	V	40	iii	vi	iii	xi (rubbish from inhabited islands, fishing operations and visitors, raw sewage from fishing huts), v (rats, mice)
Houtman Abrolhos *Atriplex cinerea* dwarf shrubland including nesting burrows of seabirds such as shearwaters and petrels.	V	31	iii	vi	iii	vi (iceplant, Bryophyllum, Boxthorn), xii (damage by visitors), vii (fire has not been recorded in most areas)

Community	Status	NVIS[1]	Condition[2]	Trend[3]	Reliability[4]	Threatening Processes[5]
Pavement limestone, dunes and consolidated dunes on North Island and East and West Wallabi Islands	V	32	ii	vi	iii	vi (iceplant, Bryophyllum, Boxthorn), xii (damage by visitors), vii (fire has not been recorded in most areas)
Eucalyptus oraria on East Wallabi Island	V	29	iii	vi	iii	vi (iceplant), xii (damage by visitors), vii (fire has not been recorded in most areas)
Saltlake and saltbush flats on islands such as North and West Wallabi	V	31		vi	iii	vi (iceplant, annuals such as wild oats), xii (damage by visitors), vii (fire has not been recorded in most areas)
Melaleuca megacephala – Allocasuarina campestris river heath (Lower Chapman River) part of Beard Vegetation Association 359	V	26, 15	iii	ii	ii	xii (human access on horses and mountain and trail bikes), ii, v (rabbits), vi (box thorn, pattersons curse, grasses) vii
Verticordia low heath (Chapman River Regional Park) part of Beard Vegetation Association 359	V	30	iii	iii	ii	v (rabbits and cats), vi (pattersons curse, grasses), xii (urban encroachment, human access on horses and mountain and trail bikes, proposed road works)

[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)					
Petrogale lateralis lateralis	V	i	i	ii	v (foxes, goats, cats), iii, iv
SCHEDULE 1; RARE/LIKELY TO BECOME EXTINCT, DIV 2 (BIRDS)					
Anous tenuirostris melanops	V	ii	iii	iii	v (rats, mice), ii (ice plant, wild oats, boxthorn)
Calyptorhynchus latirostris	E	ii	iii	ii	ii, v (foxes & cats), xii (poaching of nests)
Leipoa ocellata	V	i	iii	iii	v (foxes, cats), iii, iv
Turnix varia scintillans	V	iii	iv	ii	v (rats, mice), ii (ice plant, wild oats, boxthorn)
SCHEDULE 4; OTHER SPECIALLY PROTECTED FAUNA. DIVISION 2 (BIRDS)					
Falco peregrinus	SP	iv	iii	ii	ii
OTHER SPECIES AT RISK WITHIN THE SUBREGION					
Aspidites ramsayi	SP	i	i	i	ii, v (foxes, cats), iii
Macropus eugenii derbianus		i	iii	ii	v (foxes, cats), iii, iv
Morelia spilota imbricata	SP	ii	iii	ii	ii, v (foxes, cats), iii
Neophoca cinerea	SP	ii	iv	ii	xi (debris from fishing activities), xii (disturbance by human activities, injury through encounters with boats)
Phaethon rubricauda		ii	iii	ii	v (rats, mice), ii (ice plant, wild oats, boxthorn)

[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					
Acacia sp. Dandaragan (S van Leeuwen 269)	CR	ii	iii	iii	i, ii, vi
Beyeria lepidopetala	CR	i	i	ii	vii, ii, i
Caladenia elegans	CR	i	iii	iii	i, ii, vi, v (pigs, goats), vii, x
Chorizema humile	CR	i	ii	iii	i, ii, vi, v, vii
Eucalyptus cuprea	CR	i	ii	iii	i, ii, vii

Eucalyptus impensa	CR	ii	iii	iii	i, ii, vi, vii
Gastrolobium hamulosum	CR	ii	iii	ii	i, ii, vi,
Pterostylis sp. Northampton (SD Hopper 3349)	CR	i	ii	iii	i, ii, vi (numerous), v (pigs, goats)
Caladenia barbarella	E	ii	iii	iii	v (pigs, goats), vii, vi
Caladenia bryceana subsp. *cracens*	E	ii	iii	iii	i, ii, iv, v (goats, pigs), vi
Caladenia hoffmanii subsp. *hoffmanii*	E	i	ii	iii	v (pigs), i, ii, vi, vii
Caladenia wanosa	E	i	ii	iii	v (goats, pigs), i, ii, vii
Drummondita ericoides	E	i	iii	iii	i, ii, vi
Eucalyptus beardiana	E	iii	iii	iii	iv, vii
Eucalyptus blaxellii	E	iii	iii	iii	ii, vii
Grevillea christineae	E	i	ii	iii	i, ii, vi, vii
Hydatella leptogyne	E	i	i	ii	ix, x
Hypocalymma longifolium	E	i	ii	iii	x, ix, v (goats), vi (numerous)
Lechenaultia chlorantha	E	ii	ii	iii	v (pigs, goats)
Acacia forrestiana	V	ii	iii	iii	i, ii, vii
Conostylis dielsii subsp. *teres*	V	ii	iii	iii	i, ii, vi, v (rabbits)
Conostylis micrantha	V	ii	iii	iii	i, ii, vi, v (rabbits)
Drakaea concolor ms	V	i	ii	iii	v (pigs, goats), ii
PRIORITY 1					
Acacia ampliata	1	ii	iii	iii	i, ii, v (goats)
Acacia lineolata subsp. *multilineata*	1	ii	ii	ii	i, ii
Acacia nigripilosa subsp. *latifolia*	1	ii	iii	ii	i, ii
Acacia pelophila	1	ii	iii	ii	i, ii, v, vi
Baeckea sp. East Yuna (R Spjut & C Edson 7077)	1	ii	iii	ii	i, ii, vi
Chamelaucium oenanthum ms	1	ii	vi	iii	v (goats, pigs), iv
Cuphonotus humistratus	1	ii	vi	ii	i, ii, vi
Desmocladus glomeratus	1	i	iii	ii	i, ii, vi
Eremophila brevifolia	1	i	ii	ii	i, ii, vi, vii, v (pigs and rabbits)
Erymophyllum hemisphaericum	1	i	i	ii	i, ii, vi
Eucalyptus sargentii subsp. *fallens*	1	ii	iii	iii	i, ii, ix
Frankenia bracteata	1	ii	vi	ii	i, ii
Gastrolobium propinquum	1	ii	iii	iii	i, ii, vi (numerous)
Gnephosis cassiniana	1	ii	iii	iii	i, ii,
Grevillea fililoba	1	ii	iii	iii	i, ii, vi (numerous)
Leucopogon teretostylus ms	1	ii	vi	ii	i, ii, vi (numerous)
Macarthuria georgeana	1	ii	iii	ii	i, ii, vi (numerous)
Malleostemon sp. Erangy Springs (M Trudgen 12030)	1	ii	iii	iii	i, ii, vi (numerous)
Malleostemon sp. Hardabutt Rapids (Bellairs 1654A)	1	ii	iii	ii	v (pigs, goats)
Malleostemon sp. Mullewa (B Winson B7365)	1	ii	iii	ii	i, ii, vi
Species Name	Status	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
Malleostemon sp. Unmade Road (Griffin 7537)	1	ii	iii	ii	i, ii
Malleostemon sp. Yerina (SJ Patrick 2728)	1	ii	iii	ii	i, ii, vii, iv, vi
Melaleuca huttensis	1	ii	iii	ii	i, ii, iv ,vi, vii
Melaleuca oldfieldii	1	ii	vi	ii	i, ii, iv, vi, vii, ix
Micromyrtus rogeri	1	ii	iii	ii	i, ii, iv, vi
Micromyrtus sp. Three Springs (Cranfield 7885)	1	ii	iii	ii	i, ii, iv, vi, vii
Persoonia papillosa	1	ii	iii	ii	i, ii
Prostanthera scutata	1	unknown	unknown	ii	i, ii
Ptilotus chortophytum	1	ii	vi	ii	i, ii
Schoenia filifolia subsp. *arenicola*	1	ii	vi	ii	i, ii, vi (numerous)
Schoenia filifolia subsp. *subulifolia*	1	ii	iii	ii	i, ii, vi (numerous)
Scholtzia cordata ms	1	ii	vi	ii	i, ii, v (goats, pigs)

Scholtzia sp. Binnu (M Trudgen 2218)	1	ii	iii	ii	i, ii
Scholtzia sp. Binnu East Road (ME Trudgen 12013)	1	ii	iii	ii	i, ii
Scholtzia sp. Kojarena (AM Ashby 1904)	1	ii	iii	ii	i, ii
Scholtzia sp. Nolba (E Place s.n. Jan 1964)	1	ii	iii	ii	i, ii
Scholtzia sp. Valentine Road (S Patrick 2142)	1	ii	iii	ii	i, ii
Scholtzia sp. Whelarra (ME Trudgen 12018)	1	ii	iii	ii	i, ii
Stenanthemum bilobum	1	ii	iii	ii	i, ii
Stenanthemum gracilipes	1	ii	iii	ii	i, ii
Stylidium pseudocaespitosum	1	ii	iii	iii	i, ii
Stylidium xanthopis	1	ii	iii	ii	i, ii, ix, vii
Synaphea oulopha	1	ii	vi	ii	i, ii, iv, vii
Synaphea sparsiflora	1	ii	iii	ii	i, vi, vii
Tricoryne thiniigena ms	1	ii	iii	ii	i, ii, iv, vii, v (rabbits)
Verticordia eurardyensis x	1	ii	iii	iii	v (goats), iv
Verticordia lepidophylla var. *quantula*	1	ii	vi	ii	v (goats), iv
Vittadinia cervicularis var. *occidentalis*	1	i	i	ii	i, ii, vi, vii
PRIORITY 2					
Acacia gelasina	2	ii	iii	ii	v (goats), iv
Acacia lanceolata	2	ii	iii	iii	i, ii, vi
Acacia leptospermoides subsp. *obovata*	2	ii	ii	iii	i, ii, v (goats, pigs)
Acacia megacephala	2	iii	iv	iii	i, ii
Acacia stereophylla var. *cylindrata*	2	ii	iii	iii	i, ii, v
Acacia subrigida	2	ii	vi	ii	v (goats), iv, vi
Anthotroche myoporoides	2	iii	iv	iii	v (goats), iv
Baeckea sp. Whelarra (AC Burns 7)	2	ii	iii	ii	i, ii, v (pigs)
Baeckea sp. Yuna (M Trudgen 2224)	2	ii	iii	ii	i, ii, v (pigs)
Baeckea subcuneata	2	ii	iii	iii	v (goats), iv
Calectasia browneana	2	ii	iii	ii	i, ii, v (pigs, goats)
Calytrix harvestiana	2	ii	iii	iii	v (goats), iv
Calytrix paucicostata	2	ii	iii	iii	v (goats, pigs)
Calytrix purpurea	2	ii	iii	iii	v (goats, pigs)
Chthonocephalus tomentellus	2	iii	iii	ii	v (goats), iv, vi
Comesperma rhadinocarpum	2	ii	iii	ii	i, ii, vi
Cryptandra glabriflora	2	ii	iii	iii	i, ii, v (goats, pigs)
Cryptandra nola	2	ii	iii	iii	i, ii
Cryptandra scoparia var. *microcephala*	2	iii	vi	iii	v (goats, pigs), i, ii
Dampiera krauseana	2	ii	iii	ii	i, ii, vi
Dicrastylis incana	2	ii	iii	iii	i, ii
Species Name	Status	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
Epitriche demissus	2	ii	iii	iii	i, ii
Eremaea acutifolia	2	ii	iii	ii	i, ii, vi
Frankenia confusa	2	ii	vi	ii	i, ii
Grevillea bracteosa	2	i	ii	iii	i, ii, vi (numerous)
Grevillea stenomera	2	ii	iii	iii	v (goats, pigs), iv
Guichenotia quasicalva ms	2	ii	iii	ii	i, ii, vi (numerous)
Hemigenia pimelifolia	2	ii	iii	ii	i, ii, vi, v (rabbits, pigs)
Homalocalyx inerrabundus	2	ii	iii	ii	i, ii, v (goats), iv, vi, vii
Leucopogon oblongus ms	2	ii	ii	ii	i, ii, vi, vii
Malleostemon sp. Kalbarri (LA Craven 7083)	2	ii	iii	ii	v (pigs, goats), i, ii, iv, vii, vi
Malleostemon sp. Moonyoonooka (RJ Cranfield 2947)	2	ii	vi	ii	i, ii, iv, vi, vii
Melaleuca filifolia	2			ii	i, ii, iv, vii, ix, x

Microcorys tenuifolia	2	ii	iii	ii	i, ii, iv, vi
Micromyrtus sp. Arrowsmith River (LA Craven 6873 & C Chapman)	2	ii	iv	ii	i, ii, iv, vi, vii
Millotia jacksonii	2	ii	iii	ii	i, ii, iv, vi, vii
Murchisonia fragrans	2	ii	iii	ii	v (pigs, goats), vi, xii (recreation)
Persoonia brachystylis	2	ii	iii	ii	iv, v (goats) vi, vii
Persoonia pentasticha	2	ii	iii	ii	i, ii, iv, v (goats) vi, ix
Philotheca kalbarriensis	2	ii	vi	ii	v (goats) iv, i, ii, iv, vii
Platysace sp. Kalbarri (D & B Bellairs 1383)	2	ii	vi	ii	xii (recreation), vii
Schoenus badius	2	ii	iii	ii	i, vi
Schoenus griffinianus	2	ii	vi	ii	i, ii, iv, v (rabbits), vi, vii
Schoenus sp. Kalbarri (K Newbey 9352)	2	ii	iii	ii	iv, v (goats)
Scholtzia sp. East Yuna (AC Burns 6)	2	ii	iii	ii	i, ii, v (rabbits)
Scholtzia sp. Eradu (RD Royce 8016)	2	ii	iii	ii	i, ii, iv, v (goats), vii
Scholtzia sp. Eurardy (JS Beard 6886)	2	ii	iii	ii	iv, v (goats)
Scholtzia sp. Folly Hill (ME Trudgen 12097)	2	ii	vi	ii	v (goats), vii, ii
Scholtzia sp. Galena (WE Blackall 4728)	2	ii	vi	ii	v (goats), vi
Scholtzia sp. Geraldton (F Lullfitz 3216)	2	ii	iv	ii	i, ii
Scholtzia sp. Murchison River (AS George 7098)	2	ii	iii	ii	v (goats, pigs), vii, xii (recreation)
Scholtzia sp. Ross Graham Lookout (S Maley 6)	2	ii	iii	ii	v (goats, pigs), xii (recreation)
Scholtzia sp. Z-Bend (Bellairs-Kalflora 912A)	2	ii	iii	ii	v (goats, pigs), xii (recreation)
Stenanthemum poicilum	2	ii	vi	ii	iv, v (goats)
Stylidium wilroyense	2	ii	iii	ii	i, ii, iv
Thryptomene johnsonii	2	ii	vi	ii	vii, v (goats)
Thryptomene sp. Eagle Gorge (AG Gunness 2360)	2	ii	iii	ii	v (goats), xii (recreation)
Thryptomene sp. East Yuna (JW Green 4639)	2	ii	iii	ii	ii, v (rabbits), vii
Thryptomene sp. Eneabba (RJ Cranfield 8433)	2	ii	vi	ii	vii, vi
Thryptomene sp. Eurardy (Bellairs 1649)	2	ii	vi	ii	iv, v (goats)
Thryptomene sp. Yuna Reserve (AC Burns 100)	2	ii	iii	ii	ii, v (rabbits), vii
Thryptomene stenophylla	2	ii	iii	iii	ii, xii (roadworks, urban pressure, mountain and trail bikes, horse riding), vii, v (rabbits)
Thysanotus kalbarriensis ms	2	ii	iii	ii	ii, vi
Thysanotus sp. Badgingarra (EA Griffin 2511) *[aff. sparteus]*	2	ii	vi	ii	i, ii, iv, vii
Verticordia aereiflora	2	ii	iii	ii	i, ii, iv, vii, v (rabbits)
Verticordia argentea	2	ii	vi	iii	i, ii
Species Name	Status	Condition[1]	Trend[2]	Reliability[3]	Threatening Processes[4]
Verticordia blepharophylla	2	ii	vi	ii	i, ii, iv, vii, v (rabbits)
Verticordia dasystylis subsp. *kalbarriensis*	2	ii	iii	ii	v (goats, pigs), vii
Verticordia galeata	2	ii	iii	ii	v (goats), iv, vii
Verticordia muelleriana subsp. *minor*	2	ii	iii	ii	vii, ii, v (pigs)

[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
17	Shrublands; *Acacia rostellifera* thicket	X			M
35	Shrublands; jam scrub with scattered York gum	X			H
36	Shrublands; thicket, acacia-casuarina alliance ?species	X			L
48	Shrublands; scrub-heath				L
49	Shrublands; mixed heath				L
125	Bare areas; salt lakes				L

129	Bare areas; drift sand				L
142	Medium woodland; York gum & salmon gum				H
308	Mosaic: Shrublands; *Acacia sclerosperma* sparse scrub/Succulent steppe; saltbush & bluebush	X			L
325	Succulent steppe; saltbush & samphire				L
351	Shrublands; mallee & acacia scrub with scattered York gum & red mallee	X			H
352	Medium woodland; York gum	X			M
353	Shrublands; mallee & acacia scrub with scattered York gum	X			H
359	Shrublands; acacia & banksia scrub	X			H
360	Shrublands; bowgada scrub with scattered mulga				H
364	Shrublands; bowgada scrub with scattered eucalypts & cypress pine				L
365	Shrublands; bowgada & jam scrub with scattered York gum & red mallee	X			H
368	Shrublands tree-heath between sandhills; *Banksia ashbyi, Grevillea gordoniana*, Acacia spp., Melaleuca and mallee	X			L
371	Low forest; *Acacia rostellifera*	X			H
372	Mosaic: Shrublands; scrub-heath on deep sandy flats/Shrublands; thicket, acacia-casuarina alliance	X			L
378	Shrublands; scrub-heath with scattered *Banksia* spp *E. todtiana* & *Xylomelum angustifolium* on deep sandy flats in the Geraldton Sandplain Region				L
379	Shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region	X			L
380	Shrublands; scrub-heath on sandplain	X			L
383	Shrublands; *Acacia rostellifera* scrub-heath	X			L
385	Shrublands; bowgada & jam scrub with scattered York gum				M
386	Low woodland; York gum				H
387	Shrublands; *Melaleuca cardiophylla* thicket				H
392	Shrublands; *Melaleuca thyioides* thicket				H
401	Mosaic: Shrublands; scrub-heath on coastal association on yellow sandplain/Shrublands; acacia patchy scrub	X			H
402	Shrublands; heath on coastal limestone	X			M
403	Shrublands; *Acacia ligulata* scrub-heath	X			M
404	Shrublands; bowgada & *Acacia murrayana* scrub				L
405	Shrublands; Acacia sclerosperma, bowgada & jam scrub				L
406	Shrublands; acacia, casuarina, *Eucalyptus eudesmioides, Banksia ashbyi* & other mixed species thicket				L
407	Low woodland over scrub; *Allocasuarina huegeliana* over jam scrub	X			L
408	Shrublands; scrub-heath on coastal association, yellow sandplain	X			L
412	Succulent steppe with scrub; teatree (*Melaleuca thyioides?*) over samphire				H
413	Shrublands; *Acacia neurophylla* & *A. species* thicket				H
420	Shrublands; bowgada & jam scrub	X			L

Beard Veg Assoc	Ecosystem Description	IUCN I-IV	Non-IUCN Reserve	CALM-Purchased Lease	Priority
424	Shrublands; York gum mallee scrub	X			L
427	Shrublands; jam scrub with scattered *Allocasuarina huegeliana* & York gum	X			H
431	Shrublands; *Acacia rostellifera* open scrub	X			H
433	Mosaic: Shrublands; *Acacia rostellifera* & *Melaleuca cardiophylla* thicket/Sparse low woodland; illyarrie	X			H
440	Shrublands; *Acacia ligulata* open scrub	X	X		H
675	Shrublands; mixed thicket (melaleuca & hakea?)	X	X		H
687	Shrublands; bowgada & jam scrub with scattered *Allocasuarina huegeliana* & York gum	X			H
1102	Mosaic: Shrublands; mixed heath/Shrublands; acacia patchy scrub		X		H
1141	Shrublands; jam, *Acacia rostellifera* & *Melaleuca megacephala* thicket				H
1142	Shrublands; *Acacia ligulata* & *Melaleuca uncinata* dominated thicket on dark brown loamy soil	X			L
371	*Acacia rostellifera* low forest with scattered *Eucalyptus camaldulensis* on Greenough River Alluvial Flats				M
352	Clay Flat assemblages of the Irwin River				M
675	*Melaleuca megacephala* and *Hakea pycnoneura* thicket on stony slopes of Moresby Range	X			H
352	Plant assemblages of the Irwin River Headwater flats				H
371	Plant assemblages of Hutt Lagoon	X			H
408	*Verticordia* dominated low heath on Moresby Range	X			H
675	*Allocasuarina campestris* and *Melaleuca uncinata* thicket on superficial laterite on Moresby Range	X			H
371	*Acacia rostellifera* low forest	X			H
17	Vegetation of Gorges of Murchison River lower reaches. Includes Endangered flora such as *Drakaea concolor, Caladenia wanosa, Lechenaultia chlorantha,* and *Hypocalymma longifolium*. Vulnerable flora such as *Calytrix harvestiana, Malleostemon* sp. Kalbarri, *Murchisonia fragrans*.	X			L
	Vegetation of the Northampton block - Beard's Hutt System. Vegetation type species rich and appears different, reservation rate extremely low, 3 Critically Endangered, 3 Endangered and 8 Vulnerable flora species occur in the area.				H
379	Burma Rd Sandplain. Species rich proteaceous sandplains communities containing 3 endangered flora, 7 vulnerable flora.	X			H
	Critical weight range mammals (extant species *Trichosurus vulpecula hypoleucus, Macropus eugenii derbianus, Macropus irma;* locally extinct species *Parantechinus apicalis, Dasyurus geoffroii, Isoodon obesulus, Petrogale lateralis lateralis)*				H
	Houtman Abrolhos islands mangrove communities (including seabird nesting sites and Australian Sea lion nursery sites)		X		H
	Houtman Abrolhos *Atriplex cinerea* dwarf shrubland including nesting burrows of seabirds such as shearwaters and petrels.		X		H
	Pavement limestone, dunes and consolidated dunes on North Island and East and West Wallabi Islands		X		H
	Eucalyptus oraria on East Wallabi Island		X		H
	Saltlake and saltbush flats on islands such as North and West Wallabi		X		H

L=Low, M=Medium, H=High.

Subregional constraints in order of priority

(see Appendix B, key g)

Competing Land Use: The primary issue is that agricultural activities occupy over 79% of the subregion.

Economic Constraints: The cost of land and the cost of subsequent management.

Other: Difficulties in identifying biodiversity values in some areas due to lack of resolution of data. The level of degradation of much of the subregion is significant due to agricultural practices and the impacts of feral herbivores.

Bioregional and subregional priority for reserve consolidation

GS is reservation Class 4 (see Appendix D, and Appendix C, rank 4) because 10 - 15% of its area reserved (any tenure). GS1 has 3.04% of the subregion in conservation reserves. GS2 has 13.84% of the subregion in conservation reserves. GS3 has 17.67% of the subregion in conservation reserves. GS2 has been extensively cleared for agricultural purposes leaving a biased reserve system and salinity problems are ubiquitous so Class 1 is more appropriate. Two reserves in the northern extremity of GS2 make up over 88% of the conservation estate. GS3 has also been extensively cleared in the eastern portion of the subregion and has salinity problems however reservation levels are higher and more widely spread over the landscape so Class 2 is more appropriate. GS1 has very little conservation estate however threats are less urgent (mainly relating to stock and feral animals) so Class 2 is appropriate.

Reserve management standard

Many Geraldton Sandplains reserves are becoming saline or encountering rising water tables; wildfire management facilities are limited by resources, except for fire breaks and fire-access tracks which are installed and maintained except on areas of Beekeepers Nature Reserve and Nature Reserves smaller than 200 ha; feral herbivore grazing activities now widespread (e.g. Callicivirus hasn't made a observable difference to rabbit numbers, goats are common in north and east, pigs are undergoing drastic increases in numbers and spread), and feral predator control systems are in place on Kalbarri, Badgingarra and Nambung National Parks only. The reserve management standard for GS2 is poor (see Appendix C, rank 5).

Off reserve conservation

Priority species or groups and existing recovery plans

Species or System	Specific Recovery Plan	General Recovery Plan
Macropus eugenii derbianus	No	Action Plan for Australian Marsupials and Monotremes
Petrogale lateralis lateralis	No	Action Plan for Australian Marsupials and Monotremes
Falco peregrinus	No	Action Plan for Australian Birds
Phaethon rubricauda	No	Action Plan for Australian Birds
Leipoa ocellata	Malleefowl Preservation Society have current Action Plan and ongoing research	Action Plan for Australian Birds
Anous tenuirostris melanops	No	Action Plan for Australian Birds
Calyptorhynchus latirostris	Yes - RP (draft)	Action Plan for Australian Birds
Turnix varia scintillans	No	Action Plan for Australian Birds
Morelia spilota imbricata	No	Action Plan for Australian Reptiles
Egernia stokesii stokesii	No	Action Plan for Australian Reptiles
Aspidites ramsayi	No	Action Plan for Australian Reptiles
Neophoca cinerea	No	Action Plan for Australian Seals
Acacia ampliata	No	Declared Rare and Poorly Known Flora in the Geraldton District
Acacia forrestiana	No	Declared Rare and Poorly Known Flora in the Geraldton District
Acacia gelasina	No	Declared Rare and Poorly Known Flora in the Geraldton District
Acacia lanceolata	No	Declared Rare and Poorly Known Flora in the Geraldton District
Acacia leptospermoides subsp. *obovata*	No	Declared Rare and Poorly Known Flora in the Geraldton District
Acacia lineolata subsp. *multilineata*	No	Declared Rare and Poorly Known Flora in the Geraldton District
Acacia megacephala	No	Declared Rare and Poorly Known Flora in the Geraldton District
Acacia nigripilosa subsp. *latifolia*	No	Declared Rare and Poorly Known Flora in the Geraldton District
Acacia pelophila	No	Declared Rare and Poorly Known Flora in the Geraldton District
Acacia sp. Dandaragan (S van Leeuwen 269)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Acacia stereophylla var. *cylindrata*	No	Declared Rare and Poorly Known Flora in the Geraldton District
Acacia subrigida	No	Declared Rare and Poorly Known Flora in the Geraldton District
Anthotroche myoporoides	No	Declared Rare and Poorly Known Flora in the Geraldton District
Baeckea sp. East Yuna (R Spjut & C Edson 7077)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Baeckea sp. Whelarra (AC Burns 7)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Baeckea sp. Yuna (M Trudgen 2224)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Baeckea subcuneata	No	Declared Rare and Poorly Known Flora in the Geraldton District
Beyeria lepidopetala	No	Declared Rare and Poorly Known Flora in the Geraldton District
Caladenia barbarella ms	No	Declared Rare and Poorly Known Flora in the Geraldton District
Caladenia bryceana subsp. *cracens* ms	No	Declared Rare and Poorly Known Flora in the Geraldton District
Caladenia elegans ms	Yes - IRP	Declared Rare and Poorly Known Flora in the Geraldton District
Caladenia hoffmanii subsp. *hoffmanii* ms	No	Declared Rare and Poorly Known Flora in the Geraldton District
Caladenia wanosa	No	Declared Rare and Poorly Known Flora in the Geraldton District
Species or System	Specific Recovery Plan	General Recovery Plan
Calectasia browneana	No	Declared Rare and Poorly Known Flora in the Geraldton District
Calytrix harvestiana	No	Declared Rare and Poorly Known Flora in the Geraldton District
Calytrix paucicostata	No	Declared Rare and Poorly Known Flora in the Geraldton District
Calytrix purpurea	No	Declared Rare and Poorly Known Flora in the Geraldton District
Chamelaucium oenanthum ms	No	Declared Rare and Poorly Known Flora in the Geraldton District
Chorizema humile	Yes - IRP	Declared Rare and Poorly Known Flora in the Geraldton District
Chthonocephalus tomentellus	No	Declared Rare and Poorly Known Flora in the Geraldton District
Comesperma rhadinocarpum	No	Declared Rare and Poorly Known Flora in the Geraldton District
Conostylis dielsii subsp. *teres*	No	Declared Rare and Poorly Known Flora in the Geraldton District
Conostylis micrantha	Yes - IRP	Declared Rare and Poorly Known Flora in the Geraldton District
Cryptandra glabriflora	No	Declared Rare and Poorly Known Flora in the Geraldton District
Cryptandra nola	No	Declared Rare and Poorly Known Flora in the Geraldton District
Cryptandra scoparia var. *microcephala*	No	Declared Rare and Poorly Known Flora in the Geraldton District
Cuphonotus humistratus	No	Declared Rare and Poorly Known Flora in the Geraldton District
Dampiera krauseana	No	Declared Rare and Poorly Known Flora in the Geraldton District

Desmocladus glomeratus	No	Declared Rare and Poorly Known Flora in the Geraldton District
Dicrastylis incana	No	Declared Rare and Poorly Known Flora in the Geraldton District
Drakaea concolor ms	No	Declared Rare and Poorly Known Flora in the Geraldton District
Drummondita ericoides	No	Declared Rare and Poorly Known Flora in the Geraldton District
Epitriche demissus	No	Declared Rare and Poorly Known Flora in the Geraldton District
Eremaea acutifolia	No	Declared Rare and Poorly Known Flora in the Geraldton District
Eremophila brevifolia	No	Declared Rare and Poorly Known Flora in the Geraldton District
Erymophyllum hemisphaericum	No	Declared Rare and Poorly Known Flora in the Geraldton District
Eucalyptus beardiana	No	Declared Rare and Poorly Known Flora in the Geraldton District
Eucalyptus blaxellii	No	Declared Rare and Poorly Known Flora in the Geraldton District
Eucalyptus cuprea	Yes - IRP	Declared Rare and Poorly Known Flora in the Geraldton District
Eucalyptus impensa	No	Declared Rare and Poorly Known Flora in the Geraldton District
Eucalyptus sargentii subsp. *fallens*	No	Declared Rare and Poorly Known Flora in the Geraldton District
Frankenia bracteata	No	Declared Rare and Poorly Known Flora in the Geraldton District
Frankenia confusa	No	Declared Rare and Poorly Known Flora in the Geraldton District
Gastrolobium hamulosum	No	Declared Rare and Poorly Known Flora in the Geraldton District
Gastrolobium propinquum	No	Declared Rare and Poorly Known Flora in the Geraldton District
Gnephosis cassiniana	No	Declared Rare and Poorly Known Flora in the Geraldton District
Grevillea bracteosa	No	Declared Rare and Poorly Known Flora in the Geraldton District
Grevillea christineae	No	Declared Rare and Poorly Known Flora in the Geraldton District
Grevillea fililoba	No	Declared Rare and Poorly Known Flora in the Geraldton District
Grevillea stenomera	No	Declared Rare and Poorly Known Flora in the Geraldton District
Guichenotia quasicalva ms	No	Declared Rare and Poorly Known Flora in the Geraldton District
Hemigenia pimelifolia	No	Declared Rare and Poorly Known Flora in the Geraldton District
Homalocalyx inerrabundus	No	Declared Rare and Poorly Known Flora in the Geraldton District
Hydatella leptogyne	No	Declared Rare and Poorly Known Flora in the Geraldton District
Hypocalymma longifolium	Yes - IRP	Declared Rare and Poorly Known Flora in the Geraldton District
Lechenaultia chlorantha	No	Declared Rare and Poorly Known Flora in the Geraldton District
Leucopogon oblongus ms	No	Declared Rare and Poorly Known Flora in the Geraldton District
Leucopogon teretostylus ms	No	Declared Rare and Poorly Known Flora in the Geraldton District
Macarthuria georgeana	No	Declared Rare and Poorly Known Flora in the Geraldton District
Malleostemon sp. Erangy Springs (M Trudgen 12030)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Malleostemon sp. Hardabutt Rapids (Bellairs 1654A)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Malleostemon sp. Kalbarri (LA Craven 7083)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Malleostemon sp. Moonyoonooka (RJ Cranfield 2947)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Malleostemon sp. Mullewa (B Winson B7365)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Malleostemon sp. Unmade Road (Griffin 7537)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Malleostemon sp. Yerina (SJ Patrick 2728)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Melaleuca filifolia	No	Declared Rare and Poorly Known Flora in the Geraldton District
Melaleuca huttensis	No	Declared Rare and Poorly Known Flora in the Geraldton District
Melaleuca oldfieldii	No	Declared Rare and Poorly Known Flora in the Geraldton District
Microcorys tenuifolia	No	Declared Rare and Poorly Known Flora in the Geraldton District
Micromyrtus rogeri ms	No	Declared Rare and Poorly Known Flora in the Geraldton District
Species or System	Specific Recovery Plan	General Recovery Plan
Micromyrtus sp. Arrowsmith River (LA Craven 6873 & C Chapman)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Micromyrtus sp. Three Springs (Cranfield 7885)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Millotia jacksonii	No	Declared Rare and Poorly Known Flora in the Geraldton District
Murchisonia fragrans	No	Declared Rare and Poorly Known Flora in the Geraldton District
Persoonia brachystylis	No	Declared Rare and Poorly Known Flora in the Geraldton District
Persoonia papillosa	No	Declared Rare and Poorly Known Flora in the Geraldton District
Persoonia pentasticha	No	Declared Rare and Poorly Known Flora in the Geraldton District
Philotheca kalbarriensis	No	Declared Rare and Poorly Known Flora in the Geraldton District
Platysace sp. Kalbarri (D & B Bellairs 1383)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Prostanthera scutata	No	Declared Rare and Poorly Known Flora in the Geraldton District
Pterostylis sp. Northampton (SD Hopper 3349)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Ptilotus chortophytum	No	Declared Rare and Poorly Known Flora in the Geraldton District
Schoenia filifolia subsp. *arenicola*	No	Declared Rare and Poorly Known Flora in the Geraldton District
Schoenia filifolia subsp. *subulifolia*	No	Declared Rare and Poorly Known Flora in the Geraldton District
Schoenus badius	No	Declared Rare and Poorly Known Flora in the Geraldton District
Schoenus griffinianus	No	Declared Rare and Poorly Known Flora in the Geraldton District
Schoenus sp. Kalbarri (K Newbey 9352)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia cordata ms	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia sp. Binnu (M Trudgen 2218)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia sp. Binnu East Road (ME Trudgen 12013)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia sp. East Yuna (AC Burns 6)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia sp. Eradu (RD Royce 8016)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia sp. Eurardy (JS Beard 6886)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia sp. Folly Hill (ME Trudgen 12097)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia sp. Galena (WE Blackall 4728)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia sp. Geraldton (F Lullfitz 3216)	No	Declared Rare and Poorly Known Flora in the Geraldton District

Scholtzia sp. Kojarena (AM Ashby 1904)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia sp. Murchison River (AS George 7098)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia sp. Nolba (E Place s.n. Jan 1964)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia sp. Ross Graham Lookout (S Maley 6)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia sp. Valentine Road (S Patrick 2142)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia sp. Whelarra (ME Trudgen 12018)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Scholtzia sp. Z-Bend (Bellairs-Kalflora 912A)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Stenanthemum bilobum	No	Declared Rare and Poorly Known Flora in the Geraldton District
Stenanthemum gracilipes	No	Declared Rare and Poorly Known Flora in the Geraldton District
Stenanthemum poicilum	No	Declared Rare and Poorly Known Flora in the Geraldton District
Stylidium pseudocaespitosum	No	Declared Rare and Poorly Known Flora in the Geraldton District
Stylidium wilroyense	No	Declared Rare and Poorly Known Flora in the Geraldton District
Stylidium xanthopis	No	Declared Rare and Poorly Known Flora in the Geraldton District
Synaphea oulopha	No	Declared Rare and Poorly Known Flora in the Geraldton District
Synaphea sparsiflora	No	Declared Rare and Poorly Known Flora in the Geraldton District
Thryptomene johnsonii	No	Declared Rare and Poorly Known Flora in the Geraldton District
Thryptomene sp. Eagle Gorge (AG Gunness 2360)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Thryptomene sp. East Yuna (JW Green 4639)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Thryptomene sp. Eneabba (RJ Cranfield 8433)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Thryptomene sp. Eurardy (Bellairs 1649)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Thryptomene sp. Yuna Reserve (AC Burns 100)	No	Declared Rare and Poorly Known Flora in the Geraldton District
Thryptomene stenophylla	No	Declared Rare and Poorly Known Flora in the Geraldton District
Thysanotus kalbarriensis ms	No	Declared Rare and Poorly Known Flora in the Geraldton District
Thysanotus sp. Badgingarra (EA Griffin 2511) *[aff. sparteus]*	No	Declared Rare and Poorly Known Flora in the Geraldton District
Tricoryne thiniigena ms	No	Declared Rare and Poorly Known Flora in the Geraldton District
Verticordia aereiflora	No	Declared Rare and Poorly Known Flora in the Geraldton District
Verticordia argentea	No	Declared Rare and Poorly Known Flora in the Geraldton District
Verticordia blepharophylla	No	Declared Rare and Poorly Known Flora in the Geraldton District
Verticordia dasystylis subsp. *kalbarriensis*	No	Declared Rare and Poorly Known Flora in the Geraldton District
Verticordia eurardyensis x	No	Declared Rare and Poorly Known Flora in the Geraldton District
Verticordia galeata	No	Declared Rare and Poorly Known Flora in the Geraldton District
Species or System	Specific Recovery Plan	General Recovery Plan
Verticordia lepidophylla var. *quantula*	No	Declared Rare and Poorly Known Flora in the Geraldton District
Verticordia muelleriana subsp. *minor*	No	Declared Rare and Poorly Known Flora in the Geraldton District
Vittadinia cervicularis var. *occidentalis*	No	Declared Rare and Poorly Known Flora in the Geraldton District

There is no specific regional recovery plans prepared for the Midwest.

Appropriate species recovery actions

Species	Recovery Actions[1]	Recovery Descriptions
Macropus eugenii derbianus	i, vi, xii, xiii	Re-vesting of breeding sites as Conservation Reserves. Control of weeds (e.g. Box thorn). Research into threatening processes and monitoring of populations. Capacity building.
Petrogale lateralis lateralis	vii, i, ii, ix, xii	Control of feral predators, particularly foxes. Habitat retention through reserves and on private lands. Fire management. Research.
Falco peregrinus	xii	Monitoring of existing populations.
Phaethon rubricauda	i, vi, xii, xiii	Re-vesting of breeding sites as Conservation Reserves. Control of weeds (e.g. Box thorn). Research into threatening processes and monitoring of populations. Capacity building.
Leipoa ocellata	i, ii, iii, vii, ix, xii	Habitat retention through reserves or on other State lands or on private lands. Control of feral predators and herbivores (goats) required. Fire management. Research for reduction of grazing intensity may be required.
Anous tenuirostris melanops	i, vi, xii, xiii	Re-vesting of breeding sites as Conservation Reserves. Control of weeds (e.g. Box thorn). Research into threatening processes and monitoring of populations. Capacity building.
Calyptorhynchus latirostris	i, ii, iii, vii, xiv	Habitat retention through reserves or on other State lands or on private lands. Control of foxes and cats. Reduction in habitat degradation through grazing pressure.
Turnix varia scintillans	i, ii, iii, xii, vii	Re-vesting of breeding sites as Conservation Reserves. Further habitat retention and protection on private lands and other state lands. Monitoring of existing population. Protection from threats such as wildfire.
Morelia spilota imbricata	x, vii, xii, i	Reintroduction to previous areas of habitat. Control of feral predators such as foxes and cats. Research into threatening processes other than ferals (e.g. fire regime). Habitat retention through reserves.
Egernia stokesii stokesii	x, vii, xii, i	Reintroduction to previous areas of habitat. Re-vesting of breeding sites as Conservation Reserves. Control of feral predators such as foxes and cats. Research. Habitat retention through reserves.
Aspidites ramsayi	x, vii, xii, i	Reintroduction to previous areas of habitat. Control of feral predators such as foxes and cats. Research into threatening processes other than ferals (e.g. fire regime). Habitat retention through reserves or on other State lands or on private lands.
Neophoca cinerea	i, xiii, vi, xii	Re-vesting of breeding sites as Conservation Reserves. Capacity building through education of fishing industry. Control of weeds (e.g. Box thorn). Monitoring of populations.
Acacia ampliata	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of

		herbivores (goats) required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Acacia forrestiana	i, ii, iii, ix	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research.
Acacia gelasina	i, ii, iii, vii, ix, xii	Habitat retention through reserves or on other State lands or on private lands. Control of herbivores (goats) required. Fire management. Understanding of life history requirements for all rare flora very limited and needs additional research.
Acacia lanceolata	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Acacia leptospermoides subsp. *obovata*	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Acacia lineolata subsp. *multilineata*	i, ii, iii, xii	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research.

Species	Recovery Actions[1]	Recovery Descriptions
Acacia megacephala	i, ii, iii, xii	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research.
Acacia nigripilosa subsp. *latifolia*	i, ii, iii, xii	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research.
Acacia pelophila	i, ii, iii, vi, viii, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Weed control. Revegetation. Control of herbivores (goats, rabbits) required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Acacia sp. Dandaragan (S van Leeuwen 269)	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Acacia stereophylla var. *cylindrata*	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Acacia subrigida	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Anthotroche myoporoides	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Baeckea sp. East Yuna (R Spjut & C Edson 7077)	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Baeckea sp. Whelarra (AC Burns 7)	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs) required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Baeckea sp. Yuna (M Trudgen 2224)	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Baeckea subcuneata	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Beyeria lepidopetala	i. ii. iii, ix, xii	Habitat retention through reserves or on other State lands or on private lands. Fire ecology needs determination and then management of the area to suit. Understanding of life history requirements for all rare flora very limited and needs additional research.
Caladenia barbarella ms	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Caladenia bryceana subsp. *cracens* ms	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Caladenia elegans ms	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Caladenia hoffmanii subsp. *hoffmanii* ms	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Caladenia wanosa	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Calectasia browneana	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Calytrix harvestiana	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.

Species	Recovery Actions[1]	Recovery Descriptions
Calytrix paucicostata	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Calytrix purpurea	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Chamelaucium oenanthum ms	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Chorizema humile	i, ii, iii, vi, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds possibly required. Control of herbivores required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Chthonocephalus tomentellus	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Comesperma rhadinocarpum	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Conostylis dielsii subsp. *teres*	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (rabbits) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Conostylis micrantha	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (rabbits) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Cryptandra glabriflora	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Cryptandra nola	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Cryptandra scoparia var. *microcephala*	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Cuphonotus humistratus	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Dampiera krauseana	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Desmocladus glomeratus	i, ii, iii, vi	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Dicrastylis incana	i, ii, iii, vi, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds possibly required. Control of herbivores required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Drakaea concolor ms	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Drummondita ericoides	i, ii, iii, vi	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Epitriche demissus	i, ii, iii, vi, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds possibly required. Control of herbivores required. Understanding of life history requirements for all rare flora very limited and needs additional research.

Species	Recovery Actions[1]	Recovery Descriptions
Eremaea acutifolia	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Eremophila brevifolia	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (rabbits, pigs) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Erymophyllum hemisphaericum	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Eucalyptus beardiana	i, ii, iii, ix, x, xii	Habitat retention through reserves or on other State lands or on private lands. Fire ecology needs determination and then management of the area to suit. Translocation. Understanding of life history requirements for all rare flora very limited and needs additional research.
Eucalyptus blaxellii	i. ii. iii, ix, x, xii	Habitat retention through reserves or on other State lands or on private lands. Fire ecology needs determination and then management of the area to suit. Translocation. Understanding of life history requirements for all rare flora very limited and needs additional research.
Eucalyptus cuprea	i, ii, iii, v, vii, x, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Translocation. Understanding of life history requirements for all rare flora very limited and needs additional research.
Eucalyptus impensa	i, ii, iii, ix, xii	Habitat retention through reserves or on other State lands or on private lands. Fire ecology needs determination and then management of the area to suit. Understanding of life history requirements for all rare flora very limited and needs additional research.
Eucalyptus sargentii subsp. *fallens*	i, ii, iii, xi, xii	Habitat retention through reserves or on other State lands or on private lands. Research into most appropriate method of dealing with hydrological issues required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Frankenia bracteata	i, ii, iii, vi, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds possibly required. Control of herbivores required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Frankenia confusa	i, ii, iii, vi, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds possibly required. Control of herbivores required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Gastrolobium hamulosum	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Gastrolobium propinquum	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Gnephosis cassiniana	i, ii, iii, vi, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds possibly required. Control of herbivores required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Grevillea bracteosa	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Grevillea christineae	i. ii. iii, ix, xii	Habitat retention through reserves or on other State lands or on private lands. Fire ecology needs determination and then management of the area to suit. Understanding of life history requirements for all rare flora very limited and needs additional research.
Grevillea fililoba	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Grevillea stenomera	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Guichenotia quasicalva ms	i, ii, iii, vi	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.

Species	Recovery Actions[1]	Recovery Descriptions
Hemigenia pimelifolia	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Homalocalyx inerrabundus	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Hydatella leptogyne	i, ii, iii, xi, xii	Habitat retention through reserves or on other State lands or on private lands. Research required into hydrological requirements and techniques for managing changes in hydrology. Understanding of life history requirements for all rare flora very limited and needs additional research.
Hypocalymma longifolium	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Lechenaultia chlorantha	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Leucopogon oblongus ms	i, ii, iii, xii ix,	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.
Leucopogon teretostylus ms	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Macarthuria georgeana	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Malleostemon sp. Erangy Springs (M Trudgen 12030)	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Malleostemon sp. Hardabutt Rapids (Bellairs 1654A)	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Malleostemon sp. Kalbarri (LA Craven 7083)	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Malleostemon sp. Moonyoonooka (RJ Cranfield 2947)	i, ii, iii, xii, ix	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.
Malleostemon sp. Mullewa (B Winson B7365)	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Malleostemon sp. Unmade Road (Griffin 7537)	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Malleostemon sp. Yerina (SJ Patrick 2728)	i, ii, iii, ix, xii	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.
Melaleuca filifolia	i, ii, iii, xii, ix	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.
Melaleuca huttensis	i, ii, iii, ix, xii	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.
Species	Recovery Actions[1]	Recovery Descriptions
Melaleuca oldfieldii	i, ii, iii, xii, ix	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.
Microcorys tenuifolia	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores and stock required (possibly with exclosures). Understanding of life history requirements for all rare flora very limited and needs additional research.
Micromyrtus rogeri ms	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores and stock required (possibly with exclosures). Understanding of life history requirements for all rare flora very limited and needs additional research.
Micromyrtus sp. Arrowsmith River (LA Craven 6873 & C Chapman)	i, ii, iii, ix, xii	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.
Micromyrtus sp. Three Springs (Cranfield 7885)	i, ii, iii, ix, xii	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.
Millotia jacksonii	i, ii, iii, ix, xii	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.

Murchisonia fragrans	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research. Tourism uses require monitoring and remedial action if required.
Persoonia brachystylis	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Persoonia papillosa	i, ii, iii, vi	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Persoonia pentasticha	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Philotheca kalbarriensis	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Platysace sp. Kalbarri (D & B Bellairs 1383)	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research. Tourism uses require monitoring and remedial action if required.
Prostanthera scutata	i, ii, iii, vi, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Control of herbivores required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Pterostylis sp. Northampton (SD Hopper 3349)	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Control of herbivores (pigs, rabbits) required. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Ptilotus chortophytum	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Schoenia filifolia subsp. *arenicola*	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Schoenia filifolia subsp. *subulifolia*	i, ii, iii, vi	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Schoenus badius	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Species	Recovery Actions[1]	Recovery Descriptions
Schoenus griffinianus	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Schoenus sp. Kalbarri (K Newbey 9352)	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Scholtzia cordata ms	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Scholtzia sp. Binnu (M Trudgen 2218)	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Scholtzia sp. Binnu East Road (ME Trudgen 12013)	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Scholtzia sp. East Yuna (AC Burns 6)	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Control of herbivores (rabbits) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Scholtzia sp. Eradu (RD Royce 8016)	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Scholtzia sp. Eurardy (JS Beard 6886)	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Scholtzia sp. Folly Hill (ME Trudgen 12097)	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Scholtzia sp. Galena (WE Blackall 4728)	i, ii, iii, v, vii, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Scholtzia sp. Geraldton (F Lullfitz 3216)	i, ii, iii, vi	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Scholtzia sp. Kojarena (AM	i, ii, iii, vi	Habitat retention through reserves or on other State lands or on private lands. Control of weeds

Ashby 1904)		required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Scholtzia sp. Murchison River (AS George 7098)	i, ii, iii, v, vii, vi, xii, xiv	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research. Recreation activities in the area need to be monitored and remedial actions carried out as required.
Scholtzia sp. Nolba (E Place s.n. Jan 1964)	i, ii, iii, vi	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Scholtzia sp. Ross Graham Lookout (S Maley 6)	i, ii, iii, v, vii, vi, xii, xiv	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research. Recreation activities in the area need to be monitored and remedial actions carried out as required.
Scholtzia sp. Valentine Road (S Patrick 2142)	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Scholtzia sp. Whelarra (ME Trudgen 12018)	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.

Species	Recovery Actions[1]	Recovery Descriptions
Scholtzia sp. Z-Bend (Bellairs-Kalflora 912A)	i, ii, iii, v, vii, xii, xiv	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research. Recreation activities in the area need to be monitored and remedial actions carried out as required.
Stenanthemum bilobum	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Stenanthemum gracilipes	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Stenanthemum poicilum	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs, goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Stylidium pseudocaespitosum	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Stylidium wilroyense	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Stylidium xanthopis	i, ii, iii, xii, ix	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.
Synaphea oulopha	i, ii, iii, xii, ix	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.
Synaphea sparsiflora	i, ii, iii, xii, ix	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.
Thryptomene johnsonii	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Thryptomene sp. Eagle Gorge (AG Gunness 2360)	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Thryptomene sp. East Yuna (JW Green 4639)	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (rabbits) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Thryptomene sp. Eneabba (RJ Cranfield 8433)	i, ii, iii, xii, ix	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.
Thryptomene sp. Eurardy (Bellairs 1649)	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Thryptomene sp. Yuna Reserve (AC Burns 100)	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (rabbits) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Thryptomene stenophylla	i, ii, iii, vi, vii, v, xiii	Habitat retention through reserves or on other State lands or on private lands. Control of herbivores required. Control of weeds possibly required. Fencing and capacity building required to prevent damage during roadworks.

Species	Recovery Actions[1]	Recovery Descriptions
Thysanotus kalbarriensis ms	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Thysanotus sp. Badgingarra (EA Griffin 2511) *[aff. sparteus]*	i, ii, iii, xii, ix	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.
Tricoryne thiniigena ms	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (rabbits) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Verticordia aereiflora	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (rabbits) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Verticordia argentea	i, ii, iii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Control of weeds required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Verticordia blepharophylla	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (rabbits) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Verticordia dasystylis subsp. kalbarriensis	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Verticordia eurardyensis x	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Verticordia galeata	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Verticordia lepidophylla var. *quantula*	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (goats) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Verticordia muelleriana subsp. *minor*	i, ii, iii, v, vii, vi, xii	Habitat retention through reserves or on other State lands or on private lands. Fencing. Control of herbivores (pigs) required. Control of weeds possibly required. Understanding of life history requirements for all rare flora very limited and needs additional research.
Vittadinia cervicularis var. *occidentalis*	i, ii, iii, xii, ix,	Habitat retention through reserves or on other State lands or on private lands. Understanding of life history requirements for all rare flora very limited and needs additional research. Fire ecology needs determination and then management of the area to suit.

[1]Appendix B, key h

Ecosystems and existing recovery plans

System	Beard Vegetation Association	Specific Recovery Plan	General Recovery Plan
Acacia rostellifera low forest with scattered *Eucalyptus camaldulensis* on Greenough River Alluvial Flats (Beard 1976e, Beard 1976g)	371 – Low forest: *Acacia rostellifera.*	IRP	Declared Rare and Poorly Known Flora in the Geraldton District
Clay Flat assemblages of the Irwin River (Beard 1976e)	NVIS 29 – Mallee heath and shrublands	No	Declared Rare and Poorly Known Flora in the Geraldton District
Melaleuca megacephala and *Hakea pycnoneura* thicket on stony slopes of Moresby Range (Beard 1976g, G. Keighery and N. Gibson pers. comm.)		No	Declared Rare and Poorly Known Flora in the Geraldton District

System	Beard Vegetation Association	Specific Recovery Plan	General Recovery Plan
Eucalyptus macrocarpa over Proteaceous sandplain community (M. Fitzgerald pers. comm.)	352 – Medium woodland: York gum.	No	Declared Rare and Poorly Known Flora in the Geraldton District
Plant assemblages of the Irwin River Headwater flats (Beard 1976e)	675 – Scrublands: mixed thicket (melaleuca & hakea).	No	Declared Rare and Poorly Known Flora in the Geraldton District
Plant assemblages of Hutt Lagoon (G. Keighery pers. comm.)	380 – Shrublands: scrub-heath on sandplains.	No	Declared Rare and Poorly Known Flora in the Geraldton District
Verticordia dominated low heath on Moresby Range (Beard 1976e, G. Keighery and N. Gibson pers. comm.)	352 – Medium woodland: York gum.	No	Declared Rare and Poorly Known Flora in the Geraldton District
Allocasuarina campestris and *Melaleuca uncinata* thicket on superficial laterite on Moresby Range (Beard 1976e, G. Keighery and N. Gibson pers. comm.)	371 – Low forest: *Acacia rostellifera*; 440 – Shrublands: Acacia ligulata open scrub.	No	Declared Rare and Poorly Known Flora in the Geraldton District
Eucalyptus mallee sp. and *Acacia* scrub with scattered *E. loxophleba* (Hopkins *et al.* 1996)	675 - Scrublands: mixed thicket (melaleuca & hakea).	No	Declared Rare and Poorly Known Flora in the Geraldton District
Acacia rostellifera low forest (Hopkins *et al.* 1996)	675 - Scrublands: mixed thicket (melaleuca & hakea).	No	Declared Rare and Poorly Known Flora in the Geraldton District
Vegetation of Gorges of Murchison River lower reaches. Includes Endangered flora such as *Drakaea concolor, Caladenia wanosa, Lechenaultia chlorantha,* and *Hypocalymma longifolium*. Vulnerable flora such as *Calytrix harvestiana*, *Malleostemon* sp. Kalbarri, *Murchisonia fragrans*.	353 – Shrublands: mallee & acacia scrub with scattered York gum	No	Declared Rare and Poorly Known Flora in the Geraldton District
Vegetation of the Northampton block - Beard's Hutt System. Vegetation type species rich and appears different, reservation rate extremely low, 3 Critically Endangered, 3 Endangered and 8 Vulnerable flora species occur in the area.	371 - Low forest: *Acacia rostellifera*	No	Declared Rare and Poorly Known Flora in the Geraldton District
Burma Rd Sandplain. Species rich proteaceous sandplains communities containing 3 endangered flora, 7 vulnerable flora.	17 – Shrublands: *Acacia rostellifera* thicket	No	Declared Rare and Poorly Known Flora in the Geraldton District
Critical weight range mammals (extant species) *Trichosurus vulpecula hypoleucus, Macropus eugenii derbianus, Macropus irma;* locally extinct species *Parantechinus apicalis, Dasyurus geoffroii, Isoodon obesulus, Petrogale lateralis lateralis.*	Various	Interim Recovery plans prepared for some species but not for the Ecosystem.	Action Plan for Australian Marsupials and Monotremes
Houtman Abrolhos islands mangrove communities (including seabird nesting sites and Australian Sea lion nursery sites)	379 – Shrublands: scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region	Interim Recovery plans prepared for some species but not for the Ecosystem.	Action Plan for Australian Birds; Recovery Plan for Albatrosses and Giant Petrels; The Action Plan for Australian Seals.
Houtman Abrolhos *Atriplex cinerea* dwarf shrubland including nesting burrows of seabirds such as shearwaters and petrels.	Various	No	Action Plan for Australian Birds; Recovery Plan for Albatrosses and Giant Petrels; The Action Plan for Australian Marsupials and Monotremes
Pavement limestone, dunes and consolidated dunes on North Island and East and West Wallabi Islands	NVIS 40 – Mangroves, tidal mudflats and coastal samphire	No	Action Plan for Australian Birds
Eucalyptus oraria on East Wallabi Island	NVIS 31 – Chenopod shrublands		Action Plan for Australian Birds; Declared Rare and Poorly Known Flora in the Geraldton District

System	Beard Vegetation Association	Specific Recovery Plan	General Recovery Plan
Saltlake and saltbush flats on islands such as North and West Wallabi	NVIS 39 – Mixed chenopod, samphire and forblands	No	Declared Rare and Poorly Known Flora in the Geraldton District
Eucalyptus macrocarpa over Proteaceous sandplain community (M. Fitzgerald pers. comm.)	NVIS 39 – Mixed chenopod, samphire and forblands	No	Declared Rare and Poorly Known Flora in the Geraldton District
Endangered flora of sandplain areas.	379 – Shrublands: scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region	No	Declared Rare and Poorly Known Flora in the Geraldton District
Melaleuca megacephala – Allocasuarina campestris river heath (Lower Chapman River) part of Beard Vegetation Association 359	359 – Shrublands: acacia and banksia scrub	No	Declared Rare and Poorly Known Flora in the Geraldton District.
Verticordia low heath (Chapman River Regional Park) part of Beard Vegetation Association 359	359 - Shrublands: acacia and banksia scrub	No	Declared Rare and Poorly Known Flora in the Geraldton District.

Appropriate ecosystem recovery actions

System	Recovery Actions[1]	Recovery Descriptions
Acacia rostellifera low forest with scattered *Eucalyptus camaldulensis* on Greenough River Alluvial Flats (Beard 1976e, Beard 1976g)	xii, vi, i	Further survey and research to find other occurrences. Weed control. Research original plant species. Add any further occurrences to conservation estate.
Clay Flat assemblages of the Irwin River (Beard 1976e)	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits and goats. Fire management, especially for species with generations greater than 5 to 8 years.
Melaleuca megacephala and *Hakea pycnoneura* thicket on stony slopes of Moresby Range (Beard 1976g, G. Keighery and N. Gibson pers. comm.)	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits and goats. Fire management, especially for species with generations greater than 5 to 8 years.
Eucalyptus macrocarpa over Proteaceous sandplain community (M. Fitzgerald pers. comm.)	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits and goats. Fire management, especially for species with generations greater than 5 to 8 years.
Plant assemblages of the Irwin River Headwater flats (Beard 1976e)	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits and goats. Fire management, especially for species with generations greater than 5 to 8 years.
Plant assemblages of Hutt Lagoon (G. Keighery pers. comm.)	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits and goats. Fire management, especially for species with generations greater than 5 to 8 years.
Verticordia dominated low heath on Moresby Range (Beard 1976e, G. Keighery and N. Gibson pers. comm.)	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits and goats. Fire management, especially for species with generations greater than 5 to 8 years.

System	Recovery Actions[1]	Recovery Descriptions
Allocasuarina campestris and *Melaleuca uncinata* thicket on superficial laterite on Moresby Range (Beard 1976e, G. Keighery and N. Gibson pers. comm.)	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other state lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits and goats. Fire management, especially for species with generations greater than 5 to 8 years.
Eucalyptus mallee sp. and *Acacia* scrub with scattered *E. loxophleba* (Hopkins *et al.* 1996)	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits and goats. Fire management, especially for species with generations greater than 5 to 8 years.
Acacia rostellifera low forest (Hopkins *et al.* 1996)	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits and goats. Fire management, especially for species with generations greater than 5 to 8 years.
Vegetation of Gorges of Murchison River lower reaches. Includes Endangered flora such as *Drakaea concolor, Caladenia wanosa, Lechenaultia chlorantha,* and *Hypocalymma longifolium*. Vulnerable flora such as *Calytrix harvestiana, Malleostemon* sp. Kalbarri, *Murchisonia fragrans*.	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits, goats and pigs. Fire management, especially for species with generations greater than 5 to 8 years.
Vegetation of the Northampton block - Beard's Hutt System. Vegetation type species rich and appears different, reservation rate extremely low, 3 Critically Endangered, 3 Endangered and 8 Vulnerable flora species occur in the area.	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits and goats. Fire management, especially for species with generations greater than 5 to 8 years.
Burma Rd Sandplain. Species rich proteaceous sandplains communities containing 3 endangered flora, 7 vulnerable flora.	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits and goats. Fire management, especially for species with generations greater than 5 to 8 years.
Critical weight range mammals (extant species) *Trichosurus vulpecula hypoleucus, Macropus eugenii derbianus, Macropus irma;* locally extinct species *Parantechinus apicalis, Dasyurus geoffroii, Isoodon obesulus, Petrogale lateralis lateralis.*	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits and goats. Fire management, especially for species with generations greater than 5 to 8 years.
Houtman Abrolhos islands mangrove communities (including seabird nesting sites and Australian Sea lion nursery sites)	i, iii, ii, vi, ix	Habitat protection through reserves, on other State lands and on private lands. Weed control for critical habitats. Fire management, especially for species with generations greater than 5 to 8 years.
Houtman Abrolhos *Atriplex cinerea* dwarf shrubland including nesting burrows of seabirds such as shearwaters and petrels.	i, iii, ii, vi, ix	Habitat protection through reserves, on other State lands and on private state lands. Weed control for critical habitats. Fire management, especially for species with generations greater than 5 to 8 years.
Pavement limestone, dunes and consolidated dunes on North Island and East and West Wallabi Islands	i, iii, ii, vi, ix	Habitat protection through reserves, on other State lands and on private lands. Weed control for critical habitats. Fire management, especially for species with generations greater than 5 to 8 years.
Eucalyptus oraria on East Wallabi Island	i, iii, ii, vi, ix	Habitat protection through reserves, on other State lands and on private lands. Weed control for critical habitats. Fire management, especially for species with generations greater than 5 to 8 years.

System	Recovery Actions[1]	Recovery Descriptions
Saltlake and saltbush flats on islands such as North and West Wallabi	i, iii, ii, vi, ix	Habitat protection through reserves, on other State lands and on private lands. Weed control for critical habitats. Fire management, especially for species with generations greater than 5 to 8 years.
Eucalyptus macrocarpa over Proteaceous sandplain community (M. Fitzgerald pers. comm.)	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits, goats and foxes. Fire management, especially for species with generations greater than 5 to 8 years.
Endangered flora of sandplain areas.	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits, goats and foxes. Fire management, especially for species with generations greater than 5 to 8 years.
Melaleuca megacephala – Allocasuarina campestris river heath (Lower Chapman River) part of Beard Vegetation Association 359	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits, goats and foxes. Fire management, especially for species with generations greater than 5 to 8 years.
Verticordia low heath (Chapman River Regional Park) part of Beard Vegetation Association 359	i, iii, ii, v, vi, vii, ix	Habitat protection through reserves, on other State lands and on private lands. Fencing as exclosures where feral herbivores are present. Weed control for critical habitats. Feral animal control of rabbits, goats and foxes. Fire management, especially for species with generations greater than 5 to 8 years.

[1]Appendix B, key h

Most communities have various component species covered by recovery or action plans, but these are not yet available for the community unit.

Subregion priority for off reserve conservation

The subregional priority for off park conservation in GS2 has a rank of (ii) (see Appendix C, rank 6) indicating a large off-park effort is required.

Conservation actions as an integral part of NRM

Existing NRM actions

NRM Action	Description	Effectiveness
Legislation	Soil conservation and land clearing legislation.	Low. Not rigorously enforced, penalties ineffective.
Incentives	Covenanting of bushland by landholders	Incentives are inadequate (e.g. rate or tax deductibility, lack of management advice and assistance).
Capacity Building	Bushcare Programme, leadership training for volunteer organizations.	Uptake low.
Other Planning Opportunities	Batavia Coast Regional Strategy, Local Government strategies for controlling development and assessing proposals	Low to moderate. Frequently discussion of NRM is minimal.
Integration with Property Management Planning, Catchment Planning and Landcare	Number of Land Conservation District Committees; Northern Agriculture Catchment Council (NACC) is the Regional NRM group (mixed Government, landholders and community representation).	Low to moderate. LCDCs are largely inactive or focused on enterprise activities. NACC is poorly representative and with limited capacity but is improving. NACC strategy will set priorities for future funding opportunities with NHT2 and the National Action Plan for salinity

Feasible opportunities for NRM

Legislation: Requires more rigorous control.

Institutional Reform: Rural reconstruction, industry reconstruction, new tenure and management arrangements.

Tradable Rights: Carbon credits would provide impetus to new revegetation efforts.

Other Planning Opportunities: Including local government planning and National Action Plan for Water Quality and Salinity. NACC strategy will set priorities for future funding opportunities with NHT2 and the National Action Plan for salinity. As fragmentation and decline of remnant vegetation is the top priority in this strategy, it provides an excellent opportunity to obtain funding for biodiversity.

Integration with Property Management Planning, Catchment Planning and Landcare

Other: Increasing the role of NRM in all agricultural activities.

Impediments or constraints to opportunities

A number of impediments exist. The current role of Government Departments in NRM and policing of activities such as land clearing is fragmented and unclear. Departments who have responsibility for resource exploitation may also have resource protection roles. Penalties for undertaking activities such as land clearing are comparatively minor and do not have the support of the greater rural community. Need to increase awareness of conservation values through education of various industries (mining, agricultural) 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 GS2 (i) (see Appendix C, rank 7), indicating that there are major constraints. It is a similar situation as AW1 & MAL2.

Data gaps

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

Vegetation and Regional Ecosystem Mapping: Regolith mapping availability limited to very small areas (less than 5%) of the subregion at a scale of 1:50 000. Beards vegetation is mapped at a resolution of 1:250 000 at best. This data is critical, without more data further analysis and prioritisation can't occur.

Systematic Fauna Survey: Although a regional fauna survey has been completed, it was sparse (18 terrestrial quadrats and 4 wetland quadrats across subregion), with quadrats only positioned on 10 of the most widespread surface-types and only 1-2 quadrats per surface-type. Also, it was confined to vertebrates and selected invertebrate taxa, and few quadrats were sampled on more than two occasions. There is no long-term survey data on species population trends in most reserves, even for vertebrates.

Floristic Data: Although regional survey of flora has been completed, it is based on very sparse sampling (71 quadrats across subregion), with the quadrats confined to the 11 most widespread surface-types.

Ecological and Life History Data: 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 a regional context on life-history(including population-trend) of most species, including CWR mammals and introduced pests such as rabbits, goats, cats and foxes.

Other Data Gaps Include: There is little quantitative data on the affect of exotic predators, and no quantitative data on the affect of weed colonisation, fragmentation, fire and introduced herbivores.

Sources

References cited

No.	Author	Date	Title	Publication Details	Pub. Type
069	Beard, J.S.	(1976e).	Vegetation Survey of Western Australia. The Vegetation of the Geraldton Area, Western Australia. 1:250,000 series.	Vegmap Publications: Applecross.	O
071	Beard, J.S.	(1976g).	The vegetation of the Ajana Area Western Australia. Vegetation Survey of Western Australia.	National Library of Australia.	O
090	Benshemesh, J.	(2000).	National Recovery Plan for Malleefowl.	Department of Environment and Heritage, South Australia.	R
142	Cale, B.	(2000a).	Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*). Draft Recovery Plan Recovery Plan No. //.	Department of Conservation and Land Management.	R
181	Cogger, H., Cameron, E., Sadlier, R. and Eggler, P.	(1993).	The Action Plan for Australian Reptiles.	Australian Nature Conservation Agency, Canberra.	R
274	Environmental Protection Authority	(1976).	Conservation Reserves for Western Australia. Systems 1,2,3,4.	Environment Protection Authority, Perth.	R
270	Environmental Protection Authority	(1974).	Conservation Reserves for Western Australia.	Environmental Protection Authority, Perth.	R
814	Evans, R., Brown, A. and English, V.	(1999).	Mallee box (*Eucalyptus cuprea*) Interim Recovery Plan 1999-2002 (IRP No 43)	Department of Conservation and Land Management, Perth	O
298	Garnett, S.T. and Crowley, G.M.	(2000).	The Action Plan for Australian Birds.	Environment Australia, Canberra.	R
813	Holland, E., Kershaw, K. and Brown, A.	(1997).	Small flowered Conostylis (*Conostylis micrantha*) Interim Recovery Plan 1996-1999 (IRP No 29)	Department of Conservation and Land Management, Perth	O
371	Hopkins, A.J.M., Coker, J., Beeston, G.R., Bowen, P. and Harvey, J.M.	(1996).	Conservation Status of Vegetation Types throughout Western Australia, Australian Nature Conservation Agency National Reserves Systems Co-operative Program Project No N703 Final Report May 1996.	Department of Conservation and Land Management, Western Australia and Department of Agriculture, Western Australia.	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
537	Patrick, S.J.	(2001).	Declared Rare and Poorly Known Flora in the Geraldton District. Wildlife Management Program No. 26.	Department of Conservation and Land Management.	R
815	Phillimore, R. and English, V.	(2001).	Long-leaved myrtle (*Hypocalymma longifolium*) Interim Recovery Plan 2001-2004 (IRP No 88)	Department of Conservation and Land Management, Perth	O
812	Phillimore, R., Brown, A., Kershaw, K., Holland, E. and English, V.	(2000).	Elegant spider orchid (*Caladenia elegans* ms) Interim Recovery Plan 2000-2003 (IRP No 63)	Department of Conservation and Land Management, Perth	O
781	Shaugnessy, P.D.	(1999).	The action plan for Australian seals	Environment Australia, Canberra.	O
731	Stack, G. and English, V.	(1999).	Prostrate Flame Flower (*Chorizema humile*) Interim Recovery Plan 1999-2002 (IRP No 31)	Department of Conservation and Land Management	O

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

Other relevant publications

See reference numbers 026, 065, 070, 083, 094, 101, 114, 118, 128, 137, 162, 241, 267, 268, 273, 277, 285, 294, 299, 326, 335, 341, 347, 369, 381, 387, 406, 412, 419, 429, 451, 459, 476, 526, 531, 562, 731, 633, 647, 648, 685, 686 and 811 in Appendix A.