

**FITZGERALD
BIOSPHERE**



**Threatened Species
Profiles**

FITZGERALD BIOSPHERE ▪ Threatened Species Profiles

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ABBREVIATIONS

DEC ▪ Western Australia Department of Environment and Conservation

IUCN ▪ International Union for the Conservation of Nature and Natural Resources

Mt ▪ Mount

NP ▪ National Park

NR ▪ Nature Reserve

NSW ▪ New South Wales

NT ▪ Northern Territory

SA ▪ South Australia

spp. ▪ multiple species belong to single genus

subsp. ▪ subspecies

VIC ▪ Victoria

WA ▪ Western Australia

ACKNOWLEDGEMENTS

These threatened species profiles were prepared by Saul Cowen for DEC South Coast Region. The following people assisted in the preparation of these profiles:

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Carnaby's Black-Cockatoo ▪ *Calyptorhynchus latirostris* (Psittacidae)
(White-tailed or Short-billed Black-Cockatoo)

Conservation Status

- IUCN Red List 2010: **Endangered**
- Environment Protection & Biodiversity Conservation Act 1999: **Endangered**
- Western Australian Wildlife Conservation Act 1950: **Endangered**



Photo: © Raana Scott

Description

Large black cockatoo (53-58cm), with white cheek patch and white interior to tail feathers. Males distinguishable by black (rather than grey) bill and red (not grey) eye-ring. Heavy bill structure differs slightly from very similar Baudin's Black-Cockatoo (*C. baudinii*) in that the upper mandible is shorter but this can be difficult to observe in the field. Gregarious and outside the breeding season forms large flocks.

Distribution and Habitat

Occurs patchily throughout much of the south-west land division, from the Murchison River in the north-west to the Esperance region in the south-east.

References

- BirdLife International (2009) Species factsheet: *Calyptorhynchus latirostris*. Downloaded from <http://www.birdlife.org> on 16/2/2010
- Cale, B. (2003) Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan 2002-2012 for Carnaby's Black-Cockatoo Recovery Team. Department of Conservation and Land Management, Perth, Western Australia.
- Department of the Environment, Water, Heritage and the Arts (2010) *Calyptorhynchus latirostris* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra. <http://www.environment.gov.au/sprat>. Accessed 23/2/2010

Several nesting sites known with Fitzgerald Biosphere.

Mainly occurs in uncleared or remnant eucalypt woodland or heath. Outside the breeding season, may occur in *Banksia* woodland, coastal heathland as well as pine (*Pinus* spp.) plantations. Feeding habitat needs to be within 20km of nesting site for successful breeding to occur. Larger eucalypts (e.g. Marri (*Corymbia callophylla*); Karri (*Eucalyptus diversicolor*)) are believed to be less important but may frequently be seen in these habitats.

Biology and Ecology

Generalist seed-eaters, feeding on a wide range of both native and introduced flora. Usually arboreal but will occasionally feed on the ground. Will also feed on the nectar of native Proteaceae, as well as extracting insect larvae from the fruits and flowers of *Banksia* species.

Socially monogamous and pairs retain strong pair bonds for the duration of their reproductive lives (>4-5yrs for females). A hollow-nester, requiring suitably sized hollows for breeding.

Threats

Loss of both breeding and feeding habitat; illegal harvesting of nestlings for cage-bird trade; competition for nesting hollows with other cockatoo species and feral Honeybees (*Apis mellifera*).

Western Bristlebird ▪ *Dasyornis longirostris*

(Dasyornidae)

Conservation Status

- IUCN Red List 2010: **Vulnerable**
- Environment Protection & Biodiversity Conservation Act 1999: **Vulnerable**
- Western Australian Wildlife Conservation Act 1950: **Vulnerable**



Photo: © Ray Smith

Description

A medium-sized (c.17cm) ground-dwelling bird with short wings and long, graduated tail. Colouration is generally rufous-brown with fine dark-brown scalloping. The underparts brownish-grey. An elusive species and often difficult to observe.

Distribution and Habitat

Endemic to south-west WA and occurs in two disjunct areas: from Two Peoples' Bay NR to Cheynes Beach and in the

Fitzgerald River NP as far east as East Mt Barren. Not recorded between these populations, which are themselves fragmented.

Favours diverse areas of closed coastal heathland, usually with abundant sedges and low eucalypt thickets. May reoccupy burnt areas 2-3 yrs post-fire but in drier areas it may take 11-14 yrs.

Biology and Ecology

Ground-foraging species with diet consisting mainly of seeds and invertebrates. Weak flier and generally terrestrial but will occasionally make short flights.

Song is distinctive and antiphonal, i.e. 'male' call is answered by 'female' call. Little is known of breeding biology but pairs appear to hold territories together.

Threats

Stochastic events especially extensive or high frequency wildfires; reduction of floristic diversity through 'dieback' caused by *Phytophthora cinnamomi* pathogen; predation by feral predators; fragmentation of existing habitat.

References

- BirdLife International (2009) Species factsheet: *Dasyornis longirostris*. Downloaded from <http://www.birdlife.org> on 23/2/2010
- Department of the Environment, Water, Heritage and the Arts (2010) *Dasyornis longirostris* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra. <http://www.environment.gov.au/sprat> - Accessed 23/2/2010
- Gilfillan, S., Comer, S., Burbidge, A., Blyth, J. & Danks, A. (2009) South Coast Threatened Birds Recovery Plan 2009-2018 for South Coast Threatened Birds Recovery Team. Department of Environment and Conservation, Perth, Western Australia. (Unpublished)

Chuditch ▪ *Dasyurus geoffroii*
(Western Quoll)

(Dasyuridae)

Conservation Status

- IUCN Red List 2010: **Near Threatened**
- Environment Protection & Biodiversity Conservation Act 1999: **Vulnerable**
- Western Australian Wildlife Conservation Act 1950: **Vulnerable**



Photo: © Cameron Tiller (DEC)

Description

Australia's largest carnivorous marsupial, with mature adults attaining the size of a small domestic cat and weighing up to 1.3kg. Pelage reddish-brown with white spots. Long tail graduates to black at distal end.

Distribution and Habitat

Formerly occupied up to 70% of Australian mainland but since mid-20th century has been confined to south-western WA. Has been translocated to various sites between Cape Arid and Kalbarri NPs and ranges widely so exact

distribution difficult to assess. However, appears to occur patchily throughout the south-west land division and appears to utilise a wide range of habitats from sclerophyll woodlands to beaches and deserts. Riparian systems may hold higher than normal densities.

Biology and Ecology

Opportunistic omnivore and consumes large invertebrates as well as small birds, mammals and reptiles. Plant material (e.g. *Zamia* (*Macrozamia riedlei*) seed pulp) occasionally eaten and may also scavenge from humans. Mainly terrestrial and nocturnal but will occasionally climb trees and forage diurnally.

Males and females reach sexual maturity in first year and rarely live longer than four years. Both sexes are promiscuous. Young spent first 2 months in pouch, after which they reside in a den.

Threats

Loss/alteration of habitat including den sites (e.g. hollow logs); high wildfire frequency; competition with and predation by feral predators; conflict with humans (e.g. illegal hunting, poisoning etc).

References

- Department of the Environment, Water, Heritage and the Arts (2010) *Dasyurus geoffroii* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra. <http://www.environment.gov.au/sprat>. - Accessed 23/2/2010
- Morris, K., Burbidge, A. & Hamilton, S. (2008) *Dasyurus geoffroii*. IUCN 2009. IUCN Red List of Threatened Species. Version 2009.2. <http://www.iucnredlist.org> - Accessed 23/2/2010.
- Orell, P. & Morris, K. (1994) Chuditch Recovery Plan (1992-2001) for Chuditch Recovery Team. Department of Conservation and Land Management, Perth, Western Australia.

Malleefowl ▪ *Leipoa ocellata*

(Megapodiidae)

Conservation Status

- IUCN Red List 2010: **Vulnerable**
- Environment Protection & Biodiversity Conservation Act 1999: **Vulnerable**
- Western Australian Wildlife Conservation Act 1950: **Vulnerable**



Photo: © Alan Danks

Description

Large, ground-dwelling bird up to 60cm long and 2.5kg in weight. Adult birds have grey necks with black medial stripe and upperparts are chestnut brown with mottled brown, black and white ocellations on the wings.

Distribution and Habitat

In Australia, occurs in a wide distribution (approximately 900,000 km²) from the Great Dividing Range in the east to Shark Bay in the west. In WA, occurs south-west of a line from Carnarvon to Eyre Bird

References

- BirdLife International (2009) Species factsheet: *Leipoa ocellata*. Downloaded from <http://www.birdlife.org> on 23/2/2010
- Department of the Environment, Water, Heritage and the Arts (2010) *Leipoa ocellata* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra. Available from: <http://www.environment.gov.au/sprat>. - Accessed 23/2/2010
- Short, J. & Parson, J. (2008) Malleefowl Conservation – informed and integrated community action. A final report to WWF Australia and Avon Catchment Council.

Observatory, often patchily especially in remnant bush in the Wheatbelt. Absent from far south-west.

In WA, occurs mainly in arid mallee/shrubland habitats on sandy soils. Abundant leaf-litter is key for the construction of mounds for reproduction.

Biology and Ecology

Generalist forager and will consume invertebrates, a variety of plant material (especially seeds) as well as fungi but may also utilise artificial sources of food (e.g. spilt grain). Terrestrial and usually forages around dawn and dusk.

A mound-nester and builds mounds 4-5m in diameter and 1m high. Pairs may raise 8-10 chicks per year. Sexually mature at 4-5 yrs and the average lifespan may be c.15 yrs.

Threats

Loss of habitat and fragmentation through land clearance; predation by feral predators; large-scale or high frequency of wildfire; competition with grazing herbivores; increased risk of predation/mortality from foraging from artificial food sources (e.g. spilt grain along roadsides).

Numbat ▪ *Myrmecobius fasciatus*

(Myrmecobiidae)

Conservation Status

- IUCN Red List 2010: **Endangered**
- Environment Protection & Biodiversity Conservation Act (1999): **Vulnerable**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Stephanie Hill (DEC)

Description

Small marsupial, with distinctive white transverse stripes on the lower back and rump over the reddish-brown pelage. Has large brush-like tail and single black and white lateral stripes on the head between the eye and lower jaw. Mature adult body length is around 200-250mm, with the tail adding 150-180mm.

Distribution and Habitat

Formerly widespread across semi-arid and arid southern Australia from western NSW and southern NT to the south-west of WA. Just two natural populations remain, at Dryandra Woodland (near

Narrogin) and Perup NR (near Manjimup). Translocated populations now exist in a number of reserves throughout the south-west, including Cocanarup Timber Reserve in the Fitzgerald Biosphere. Historically, habitat preferences were varied but currently the species is restricted to eucalypt woodland, especially Wandoo (*E. wandoo*), Jarrah (*E. marginata*) and Marri (*Corymbia callophylla*).

Biology and Ecology

Feeds almost exclusively on termites (Isoptera), extracted by digging to intercept galleries (rather than nests) and using extremely long tongue, coated in adhesive saliva. Unusually for a small marsupial is a diurnal species. Solitary and territorial, females raise young in burrows until mature enough to forage further afield. May live up to 5 yrs. Sexual maturity in first year for females; second for males.

Threats

Predation by feral predators; altered fire regimes and frequencies; loss of habitat; competition with European Rabbits (*Oryctolagus cuniculus*); predation by native avian predators, elevated in numbers by latter species.

References

- Department of the Environment, Water, Heritage and the Arts (2010) *Myrmecobius fasciatus* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra.
<http://www.environment.gov.au/sprat> - Accessed 1/4/2010
- Friend, J.A. (1989) Fauna of Australia Volume 1B (Mammalia) Chapter 22 Myrmecobiidae, Published by AGPS, Canberra, Australia.
- Friend, J.A. (1994) Recovery Plan for the Numbat (*Myrmecobius fasciatus*) 1995-2004 for the Numbat Recovery Team, Department Conservation and Land Management, Perth, Western Australia.
- Friend, T. & Burbidge, A. (2008) *Myrmecobius fasciatus*. IUCN 2010. IUCN Red List of Threatened Species. Version 2010.1. <http://www.iucnredlist.org> - Accessed 1/4/2010

Dibbler ▪ *Parantechinus apicalis*
(Southern Dibbler)

(Dasyuridae)

Conservation Status

- IUCN Red List 2010: **Endangered**
- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Endangered**



Photo: © Tim Button (DEC)

Description

Small (up to 14cm long) marsupial, with grizzled grey-brown pelage above and grey-white below as well as distinctive white orbital ring and unusually tapering hairy tail. Males 25% heavier than females and may weigh up to 100g.

Distribution and Habitat

Previously occurred throughout south-west WA and in Eyre Peninsula, SA, but until 1967 was thought extinct. Presently occurs naturally in Fitzgerald River NP and Boullanger and Whitlock Islands off Jurien Bay and translocated populations are

found on Escape Island, Peniup NR near Jerramungup and Stirling Range NP.

Likely to exploit a wide range of habitats over its range but in Fitzgerald Biosphere occurrence is associated with long-unburnt heathland, particularly with sandy or lateritic substrates, with a dense canopy >1m high.

Biology and Ecology

Carnivorous marsupial, feeding primarily on invertebrates as well as small reptiles, birds and mammals. Will also consume vegetable matter and has been recorded on flowering *Banksia* species.

Mainly crepuscular and during inactive periods rests both above and below ground. Females may live for up to 4 yrs but male life expectancy varies from 1 to 3+ yrs depending on the incidence of 'facultative male die-off' which may be experienced in some populations. Sexually mature at 10-11 months and produce one litter per year in spring.

Threats

Predation by feral predators; high frequency/intensity of wildfire; habitat loss/modification; modification of habitat through 'dieback' caused by *Phytophthora cinnamomi* pathogen.

References

- Department of the Environment, Water, Heritage and the Arts (2010) *Parantechinus apicalis* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra.
<http://www.environment.gov.au/sprat> - Accessed 1/4/2010
- Friend, J.A. (2003) Dibbler Recovery Plan July 2003 – June 2013 for the Dibbler Recovery Team, Department of Conservation and Land Management, Perth, Western Australia
- Friend, T., Burbidge, A. & Morris, K. 2008. *Parantechinus apicalis*. IUCN 2010. IUCN Red List of Threatened Species. Version 2010.1. <http://www.iucnredlist.org> - Accessed 1/4/2010

Western Ground-Parrot ▪ *Pezoporus (wallicus) flaviventris* (Psittacidae)

Conservation Status

- IUCN Red List 2010: **Not Listed***
- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Critically Endangered**

* IUCN assessment of conservation status pending review of this taxon's specific status.



Photo: © Brent Barrett (DEC)

Description

Medium-small parrot with bright green plumage and long strongly graduated tail. Extensive barring on head, wings, tail and belly. Mature adults have a crimson frons. Recent taxonomic work suggests is sufficiently distinct from Eastern Ground-Parrot (*P. (w.) wallicus*) to be afforded species status. Main distinguishing feature from *P. (w.) wallicus* is yellow hue to belly. Rarely seen except when flushed and has distinctive zig-zag flight on stiff wing-beats.

Distribution and Habitat

Formerly widespread in coastal heathland throughout south-west WA from Israelite Bay to near Dongara. Now confined to Fitzgerald River and Cape Arid NPs (and adjacent areas of Nuytsland NR). Waychinicup NP population not recorded since 2003 and presumed extinct.

Requires long-unburnt (5-40+yrs) near-coastal heathland with high floristic diversity. Vegetation is usually low (<1m high) with abundant sedges (>40% cover). May utilise more recently burnt habitat if long-unburnt habitat exists nearby.

Biology and Ecology

Generalist herbivore, consuming seeds, fruits and flowers of a range of native flora species and foraging on ground or on low shrubs. Diurnal but peak calling and flight activity before dawn and after dusk. Vocalisations distinctive series of high-pitched whistles, often combined with other discrete call types. Generally solitary but forms pairs during breeding season (Jul-Dec).

Threats

Predation by feral predators; increased frequency/intensity of wildfire; loss of floristic diversity through 'dieback' caused by *Phytophthora cinnamomi* pathogen.

References

- Burbidge, A.H., Blyth, J., Danks, A., Gillen, K., Newbey, B. (1997) Western Ground Parrot Interim Recovery Plan 1996-1999 for South Coast Threatened Birds Recovery Team. Department of Conservation and Land Management, Perth, Western Australia.
- Gilfillan, S., Comer, S., Burbidge, A., Blyth, J. & Danks, A. (2009) South Coast Threatened Birds Recovery Plan 2009-2018 for South Coast Threatened Birds Recovery Team. Department of Environment and Conservation, Perth, Western Australia. (Unpublished)
- Murphy, S.A., Joseph, L., Burbidge, A.H. & Austin, J. (Unpublished) A Cryptic And Critically Endangered Species Revealed By Mitochondrial DNA Analyses – The Western Ground Parrot.

Red-tailed Phascogale ▪ *Phascogale calura*

(Dasyuridae)

(Wambenger)

Conservation Status

- IUCN Red List 2010: **Near Threatened**
- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Endangered**



Photo: © Babs & Bert Wells (DEC)

Description

Small, arboreal marsupial, ash-grey above and cream-white below. Male body length can be up to 12.2cm, with females attaining 10.5cm in body length. The distinctive tail is reddish on proximal half and black and brush-like on distal half and may reach a length of 14.5cm.

Distribution and Habitat

Formerly widespread across much of arid and semi-arid Australia from western NSW to central NT and south-west WA. Now restricted to isolated reserves and

remnant bushland in WA wheatbelt from Ravensthorpe to Beverley.

Prefers *Allocasuarina* woodland with hollow-containing *Eucalyptus* spp. (e.g. Wandoo (*E. wandoo*)) and *Gastrolobium* spp.. Also found in Moort (*E. platypus*) and Swamp Oak (*Casuarina obesa*) woodland. Most abundant in areas unburnt for 20+ yrs and tree hollows are utilised as refuge from fire.

Biology and Ecology

Opportunistic carnivores and will consume a range of invertebrates, small birds and mammals. Nocturnal and despite arboreal habits, will often forage on ground.

Breeding occurs from Jul-Oct and young reach sexual maturity by May-Jun of following year. As with some other small dasyurids, males exhibit seasonal die-offs after mating period but females may live up to 3 yrs. Population dynamics believed to be strongly related to rainfall in the previous 12 months, i.e. high numbers associated with high rainfall.

Threats

Predation from feral predators; increased frequency of wildfires; habitat loss and fragmentation associated with land clearing; climate change (and associated reduction in rainfall).

References

- Department of the Environment, Water, Heritage and the Arts (2010) *Phascogale calura* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra.
<http://www.environment.gov.au/sprat> - Accessed 6/4/2010
- Friend, T. (2008) *Phascogale calura*. IUCN 2010. IUCN Red List of Threatened Species. Version 2010.1.
<http://www.iucnredlist.org> - Accessed 6/4/2010.

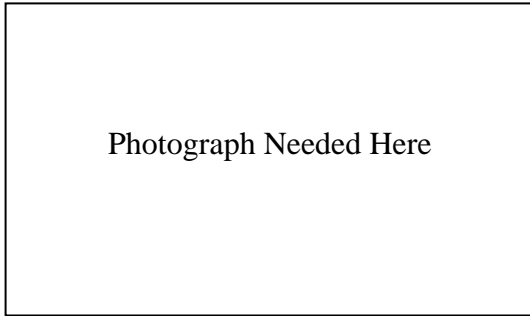
Heath Mouse ▪ *Pseudomys shortridgei*

(Muridae)

(Heath Rat)

Conservation Status

- IUCN Red List 2010: **Near Threatened**
- Environment Protection & Biodiversity Conservation Act (1999): **Vulnerable**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Description

Small grey-brown rodent, superficially similar to more common and widespread *Rattus* spp. but distinguished by scales on tail which do not occur in ring formation. Pelage flecked with buff and black above and paler below. Tail is bicoloured (dark on top, pale below).

Distribution and Habitat

Formerly distributed in coastal heathland and mallee on west and south coasts of WA as well as south-west VIC and south-east SA (including Kangaroo Island).

References

- Cockburn A., (1995) Heath Rat *Pseudomys shortridgei*. The Mammals of Australia, edited by R. Strahan, pp617-618. Reed New Holland, Sydney, Australia.
- Department of the Environment, Water, Heritage and the Arts (2010) *Pseudomys shortridgei* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra.
<http://www.environment.gov.au/sprat> - Accessed 6/4/2010
- Menkhorst, P. & Morris, K. (2008) *Pseudomys shortridgei*. IUCN 2010. IUCN Red List of Threatened Species. Version 2010.1. <http://www.iucnredlist.org> - Accessed 6/4/2010

Previously thought to be extinct in WA but rediscovered in 1987. Currently known from Ravensthorpe Range, Lake Magenta NR, Dragon Rocks NR and Fitzgerald River NP in WA along with a few sites in mainland SA and VIC.

In WA, this species inhabits long unburnt (30+ yrs) mallee scrub and 'mixed' scrub (e.g. *Banksia* spp.) on loamy soils.

Biology and Ecology

Based on studies of the species in VIC, it is mainly herbivorous will feed on all manner of vegetable matter (flowers, seeds, fruits etc) with a preference for leaves and stems of monocotyledonous plants. May also feed on subterranean fungi (truffles).

Breeding occurs in late spring/summer and up to two litters of usually 3 young are produced. Females are sexually mature at 10-12 months.

Threats

Habitat loss and fragmentation; changes in fire regimes, no longer favouring mosaics of differing fire ages; predation by feral predators.

Acacia rhamphophylla
(Kundip Wattle)

(Fabaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Critically Endangered**



Photo: © Anne Cochrane (DEC)

Description

Low spreading shrub, 200-400cm high with globular yellow flowers (2.5-3mm) and dense greyish-green phyllodes (11-17mm long) which are prominently grooved with round ends but have short points below the tips. Stems appear black due to short hairs and recurved, bristly stipules. Seed pods are 10-15mm and are hard, thin and brittle and blackish in colouration.

Distribution and Habitat

Discovered in Ravensthorpe Range in 1992 and the single population occupies approximately 5ha comprising c.1,500 mature plants.

References

Hartley, R. & Barrett, S. (2005) Kundip Wattle (*Acacia rhamphophylla*) Recovery Plan 2005-2010. Department of Conservation and Land Management, Perth, Western Australia.

Occurs in open shrub mallee vegetation on stony slopes in well-drained sandy clay. Associated geology is on or near points of contact between serpentine and banded iron formation. Most common in disturbed areas but will occur in more mature vegetation types.

Biology and Ecology

Flowers prolifically in Aug-Sep. Juvenile period unknown. Regenerates well after disturbance and fire and thought to be capable of production large numbers of viable seed. Significant deaths of mature individuals may be linked to senescence, suggesting need for germination stimulants (e.g. fire). Resistance to *Phytophthora cinnamomi* unknown although majority of *Acacia* spp. are resistant.

Threats

Impacts from mining industry (e.g. loss of habitat, soil compaction, dust, weeds and pathogen introduction, increased fire risk and potential for introduction of poisonous chemicals); inappropriate fire regimes; small population size and risks associated with low genetic diversity and environmental stochasticity; climate change and associated reduction in annual rainfall.

Adenanthos dobagii

(Fitzgerald Woollybush or Jugflower)

(Proteaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Sarah Barrett (DEC)

Description

Diffuse shrub, up to 50cm high. Leaves are silvery, have three segments and are concentrated at ends of branchlets. Branches are covered in flattened hairs. Flowers small (11mm long) and cream or pale pink in groups of three. Similar to

Adenanthos flavidiflorus which also occurs in the Fitzgerald River NP.

Distribution and Habitat

Endemic to Fitzgerald River NP and restricted to seven populations in the south-central region of the park, numbering c.125,000 individual plants. The estimated area of occupancy is c.21.9km². All populations appear to be stable in the absence of wildfire. Good regeneration observed following wildfire in 1998 and 2008.

Occurs in low-lying areas among low shrubby open heath or mallee vegetation in sandy soils.

Biology and Ecology

Flowers Aug-Nov. Lacks lignotuber; killed by fire and regenerates from seed. Thought to be susceptible to *Phytophthora cinnamomi*. Juvenile period is 4 yrs.

Threats

Frequent and extensive wildfire; habitat degradation through track maintenance; risk from *Phytophthora* 'dieback'.

References

- Barrett, S., Comer, S., McQuoid, N., Porter, M., Tiller, C. & Utber, D. (2009) Identification and Conservation of Fire Sensitive Ecosystems and Species of the South Coast Natural Resource Management Region. Department of Environment and Conservation, South Coast Region, Western Australia.
- Department of the Environment, Water, Heritage and the Arts (2010). *Adenanthos dobagii* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra. <http://www.environment.gov.au/sprat> - Accessed 7/4/2010
- Robinson, C.J. & Coates, D.J. (1995) Declared Rare and Poorly Known Flora in the Albany District, Wildlife Management Program No 20. Department of Conservation and Land Management, Perth, Western Australia.
- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Adenanthos dobagii (Fitzgerald Woollybush)*. Department of the Environment, Water, Heritage and the Arts. <http://www.environment.gov.au/biodiversity/threatened/species/pubs/21253-conservation-advice.pdf> - Accessed 7/4/2010

Adenanthos ellipticus
(Oval-leaved Adenanthos)

(Proteaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Vulnerable**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Sarah Barrett (DEC)

Description

Erect, tall and open shrub that grows to 5m. Leaves 2-5cm long, 5-15mm wide, some with lobular tips. Flowers solitary, 2-5cm long, cream to orange-red in colour and held on 8mm stalks in leaf axils.

Distribution and Habitat

Endemic to Fitzgerald River NP, with 3 known populations in the vicinity of major coastal peaks within the park (East and West Mts Barren and Thumb Peak). The

species occurs over approximately 89km² although the area of occupancy is probably <0.31km² with c.40,000 mature flowering plants. Insufficient data exist to determine trends.

Favours shallow, siliceous humus-rich soils over quartzite outcrops and in dense scrub. May occur with *Adenanthos cuneatus* and *A. venosus* but prefers higher slopes than these species.

Biology and Ecology

Flowers Aug-Jan and Apr-May (possibly all year round). Lacks lignotuber; killed by fire but regenerates from soil-stored seed with seedlings exhibiting slow growth. May hybridise with *A. cuneatus*. Presumed susceptible to *Phytophthora cinnamomi*. Juvenile period is 4 yrs.

Threats

High frequency/intensity wildfire; competition from invasive weeds (e.g. climbing species); *Phytophthora* 'dieback'; habitat modification due to Hamersley Drive upgrade.

References

- Barrett, S., Comer, S., McQuoid, N., Porter, M., Tiller, C. & Utber, D. (2009) Identification and Conservation of Fire Sensitive Ecosystems and Species of the South Coast Natural Resource Management Region. Department of Environment and Conservation, South Coast Region, Western Australia.
- Department of the Environment, Water, Heritage and the Arts (2010). *Adenanthos ellipticus* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra.
<http://www.environment.gov.au/sprat> - Accessed 7/4/2010
- Robinson, C.J. & Coates, D.J. (1995) Declared Rare and Poorly Known Flora in the Albany District, Wildlife Management Program No 20. Department of Conservation and Land Management, Perth, Western Australia.
- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Adenanthos ellipticus (Oval-leaf Adenanthos)*. Department of the Environment, Water, Heritage and the Arts.
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/4570-conservation-advice.pdf> - Accessed 7/4/2010.

Anigozanthos bicolor (subspecies *minor*)
(Small Two-coloured Kangaroo Paw)

(Haemodoraceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Mike Fitzgerald (DEC)

Description

Small rhizomatous perennial herb. Leaves flattened and 5-10cm long. Flowers hairy and held on 5-20cm high scapes, with green perianth, 30-45mm long and strongly constricted in middle, and red ovary. Usually has several scapes with solitary flowers. Four subspecies of *A. bicolor* recognised and *A. b. minor* can be distinguished by strong perianth constriction and relatively short leaves.

Distribution and Habitat

Known from 14 populations on the south coast of WA between Fitzgerald River NP, Lake King and Condingup Peak (290km

range). 9 populations within Fitzgerald Biosphere. Many locations not confirmed or resighted since initial discovery. Distribution disjunct from other subspecies of *A. bicolor*.

Favours moist sandy soils in heathland communities but also occurs in shallow soils over granite outcrops.

Biology and Ecology

Flowers Aug-Oct. Flowers once in first year and then disappears, making difficult to survey. Fire presumed to be primary germination stimulus but other stimuli may include washouts caused by heavy rain and runoff.

Hermaphroditic flowers and has been observed being pollinated by honeyeaters (Meliphagidae). Juvenile period from 1-2 yrs. Presumed not susceptible to *Phytophthora cinnamomi* but is susceptible to fungal pathogens e.g. *Alternaria alternata*.

Threats

Low frequency disturbance mechanisms (including fire); habitat clearance for farmland; inappropriate fire regimes (including seasonality); modification of habitat by European Rabbit (*Oryctolagus cuniculus*); grazing by stock and feral and native herbivores; altered hydrology and salinisation of groundwater; invasive weeds.

References

- Barrett, S., Comer, S., McQuoid, N., Porter, M., Tiller, C. & Utber, D. (2009) Identification and Conservation of Fire Sensitive Ecosystems and Species of the South Coast Natural Resource Management Region. Department of Environment and Conservation, South Coast Region, Western Australia.
- Patten, J., Butler, R., Stack, G. & Brown, A. (2008) Small Two-coloured Kangaroo Paw (*Anigozanthos bicolor* subsp. *minor*) Recovery Plan 2006-2011. Interim Recovery Plan No. 223. Department of Environment and Conservation, Perth, Western Australia
- Western Australian Herbarium (1998) Florabase - The Western Australia Flora, *Anigozanthos bicolor* subsp. *minor* (Benth.) Hopper - <http://florabase.calm.wa.gov.au/browse/profile/12102> - Accessed on 7/4/2010

Beyeria cockertonii

(Euphorbiaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Not Listed**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Sarah Barrett (DEC)

Description

Small under-shrub to 25cm high with upright stems. New growth yellow and resinous with short glandular hairs, older growth with grey tessellated bark. Leaves 6-7mm long and held upright with recurved margins. Flowers yellow,

solitary and 1-2mm in diameter. Fruit dark-green and glabrous with three lobes.

Distribution and Habitat

Restricted to 2 populations south-west of Bandalup Hill near Ravensthorpe. Area of occupancy of this population is estimated at 17.2ha. Location lies within mining tenement. Overall population estimated at 318,000.

Grows in mallee-heath in smectite clay over komatiite geology on rocky slopes and hilltops.

Biology and Ecology

Killed by fire and regenerates from soil-stored seed. Stands are typically uneven-aged suggesting some inter-fire recruitment occurs.

Threats

Loss/modification of habitat through mining activity.

References

- Cockerton, G. & Eveleigh, N. (2005) Habitats, Vegetation and Flora of the Ravensthorpe Nickel Operation Tenements for BHP Biliton Ltd, Perth, Western Australia.
- Department of Environment and Conservation (2009a) Priority Ecological Communities for Western Australia. Species and Communities Branch, Department of Environment and Conservation, Perth, Western Australia.
- Department of Environment and Conservation (2009b) SAP 1. *Beyeria* sp. Bandalup Hill (G. Cockerton 7553) Department of Environment and Conservation, Perth, Western Australia. (Unpublished)

Boronia clavata
(Bremer Boronia)

(Rutaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Endangered**



Photo: © Sarah Barrett (DEC)

Description

Upright, slender shrub, 0.5-1.5m (up to 2.1m) high. Leaves 10-20mm long on short stem and flowers yellow-green.

Distribution and Habitat

Endemic to the Bremer Bay area of the south coast of WA. Known from 5 populations all within 18km of each other in a continuous area of uncleared vegetation, with all but one population on

unvested Crown reserves or within Fitzgerald River NP. Extent of occurrence is approximately 76km² and area of occupancy unknown but predicted to be <5km². 97 mature plants known to exist. Other populations may remain unsurveyed due to access difficulties. Favours alluvial sand and loam on floodplains and is associated with shrubby thickets. Largely confined to alluvial flats on Bremer River between spongolite cliffs, where populations remain healthy.

Biology and Ecology

Flowers Aug-Oct. Germination may be stimulated by flooding, when scarification (removal of hard coating) of seed takes place. Susceptibility to salinity unknown. Floral structure suggests insect-pollinated species. Presumed not to be susceptible to *Phytophthora cinnamomi*.

Threats

Potential risk from increased salinity; competition from invasive weeds; habitat loss and fragmentation; climate change and associated reduction in rainfall and sea-level rise (i.e. increased salinity of near-coastal riparian habitats).

References

- Department of the Environment, Water, Heritage and the Arts (2010). *Boronia clavata* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra.
<http://www.environment.gov.au/sprat> - Accessed 7/4/2010
- Robinson, C.J. & Coates, D.J. (1995) Declared Rare and Poorly Known Flora in the Albany District, Wildlife Management Program No 20. Department of Conservation and Land Management, Perth, Western Australia.
- Threatened Species Scientific Committee (TSSC) (2008). *Commonwealth Conservation Advice on Boronia clavata*. Department of the Environment, Water, Heritage and the Arts
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/5538-conservation-advice.pdf> - Accessed 7/4/2010

Caladenia bryceana (subspecies *bryceana*)
(Dwarf Spider Orchid)

(Orchidaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Endangered**



Photo: © Sarah Barrett (DEC)

Description

One of the smallest spider orchids in WA, rarely exceeding 5cm in height. Leaves 4-6cm long; broadly lanceolate and semi-prostrate. Flowers are usually borne singly on erect stems, are 1-1.5cm wide and are generally green although can occasionally be apricot. A glossy, dark, globular band of calli run down the centre of the labellum. Colour and size makes this species difficult to survey.

Distribution and Habitat

Known from 10+ populations spanning a range of 190km between Boyup Brook and Boxwood Hill. 8 populations occur within Fitzgerald Biosphere with approximately 330 plants.

References

- Department of Environment and Conservation (2009). Dwarf Spider Orchid (*Caladenia bryceana* subsp. *bryceana*) Recovery. Commonwealth Department of the Environment, Water, Heritage and the Arts, Canberra.
- Holland, E., Brown, A. & Kershaw, K. (1999) Dwarf Spider Orchid (*Caladenia bryceana* subsp. *bryceana* MS) Interim Recovery Plan 1999-2002. Department of Conservation and Land Management, Perth, Western Australia.

Habitat variable across range but favours sandy clay to red loam over granite geology. General habitat preference is open woodland in association with species including *Allocasuarina huegeliana*, *Eucalyptus occidentalis*, *E. wandoo* and *Acacia acuminata*, as well as other low shrubs, grasses and sedges.

Biology and Ecology

Flowers Aug-Sep. Pollination by male Thynnine wasps (Tiphiidae) through sexual attraction cues. Seeds dispersed by wind. Germination requires specific soil-borne fungi and the number of years from seedling to maturity varies with growing conditions. Killed by fire during growing season. Presumed not susceptible to *Phytophthora cinnamomi*.

Threats

Competition and habitat modification by invasive weeds; grazing by native and feral herbivores; high intensity, frequency and inappropriate seasonality of fire; habitat degradation through recreation and tourism; small population size and risks associated with low genetic diversity and environmental stochasticity; changes in hydrology; climate change and associated reduction in rainfall; habitat fragmentation.

Conostylis lepidospermoides
(Sedge *Conostylis*)

(Haemodoraceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Mike Fitzgerald (DEC)

Description

Tufted, sedge-like, rhizomatous perennial up to 35cm high and 40cm wide. Leaves 20-35cm long, flat and narrow, yellow-green and edged with two rows of short, dark bristles. Up to 6 lemon yellow flowers held in loose inflorescence on 1-4cm stalk. Floral whorl is up to 20mm long and the flowers are among the largest of this genus.

Distribution and Habitat

Recorded from 17 populations from Ravensthorpe north to 90 Mile Tank in southern WA. 1 population which occurs in Fitzgerald Biosphere has not been seen in recent years. The extent of occurrence is approximately 4,400km².

Favours verges adjacent to cleared farmland on flat or gently undulating plains in yellow or grey sand over laterite clay. Grows in low heath or sedge communities with scattered emergent shrubs.

Biology and Ecology

Flowers Sep-Oct. Pollinated by both birds and insects.

Threats

Modification of roadside verge habitat; competition from invasive weeds; grazing by native and feral herbivores (especially European Rabbit (*Oryctolagus cuniculus*); changes in hydrology (e.g. waterlogging of soil); loss of habitat (e.g. gravel extraction and clearing for agriculture).

References

- Department of the Environment, Water, Heritage and the Arts (2010). *Conostylis lepidospermoides* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra. <http://www.environment.gov.au/sprat> - Accessed 7/4/2010
- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Conostylis lepidospermoides (Sedge Conostylis)*. Department of the Environment, Water, Heritage and the Arts. <http://www.environment.gov.au/biodiversity/threatened/species/pubs/9254-conservation-advice.pdf> - Accessed 7/4/2010

Cooperhooia georgei
(Mauve Cooperhooia)

(Goodeniaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Endangered**



Photo: © Sarah Barrett (DEC)

Description

Slender, erect shrub up to 1.5m high. Leaves 2-5cm long and shallowly denticulate. Flowers solitary, up to 2cm long, varying from mauve to pink or blue in colouration and held in leaf axils at ends of branches. Two outer petals more deeply split than middle three.

Distribution and Habitat

Endemic to Fitzgerald River NP with 4 known populations comprising <500 mature individuals. Extent of occurrence is approximately 65km² and area of occupancy predicted to be <0.2ha. Populations appear stable and fire may stimulate recruitment.

Occurs in thick scrub in shallow siliceous soils over quartzite geology in stony gullies.

Biology and Ecology

Flowers Sep-Oct. Germinates after fire but sensitive during vegetative and flowering phases of life cycle. Susceptibility to *Phytophthora cinnamomi* unknown.

Threats

High frequency/intensity wildfire events; potential risk from *Phytophthora* 'dieback'; modification/loss of habitat.

References

Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Cooperhooia georgei (Mauve Cooperhooia)*. Department of the Environment, Water, Heritage and the Arts.
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/21218-conservation-advice.pdf> - Accessed 7/4/2010

Daviesia megacalyx
(Long-sepalled *Daviesia*)

(Fabaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Endangered**



Photo: © Stephen Kern (DEC)

Description

Erect, bushy shrub to 1.5m high. Branches angular and leaves are dull green, 4-8cm long and flat, broad and erect. Flowers have yellow standard petals with yellow centre, surrounded by red with red keel and are 1cm long arranged in clusters in leaf axils. Fruits are triangular; 1.5cm long with large calyx that becomes black and remains long after pods are shed.

Distribution and Habitat

Restricted to Ravensthorpe Range and occurs over a range of approximately 25km with estimated area of occupancy

References

Hartley, R. & Barrett, S. (2005) Long-sepalled *Daviesia* (*Daviesia megacalyx*) Recovery Plan. Department of Conservation and Land Management, Perth, Western Australia.

of 85ha. Total population is estimated at <109,477 mature plants in 9 populations. Confined to heavy red gravelly-clay over laterite geology on slopes and ridges, in mallee-heath.

Biology and Ecology

Flowers Jul-Sep and has juvenile period of 4 years. Presumed to be hermaphroditic and bee-pollinated as for other *Daviesia* spp. which also set seed around 3 months after flowering. Seed high in starch and oil content and attractive to animals. Killed by fire and regenerates from soil-stored seed after disturbance events. Such regeneration can be prolific. Susceptibility to *Phytophthora cinnamomi* is unknown but related *Daviesia* spp. are known to be susceptible.

Threats

Insufficient intervals in disturbance/fire events to allow seed bank regeneration; loss or modification of habitat through mining activities; *Phytophthora* 'dieback'; small population size and risks associated with low genetic diversity and environmental stochasticity; drought; climate change and associated reduction in rainfall.

Daviesia obovata
(Paddle-leaved *Daviesia*)

(Fabaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Endangered**

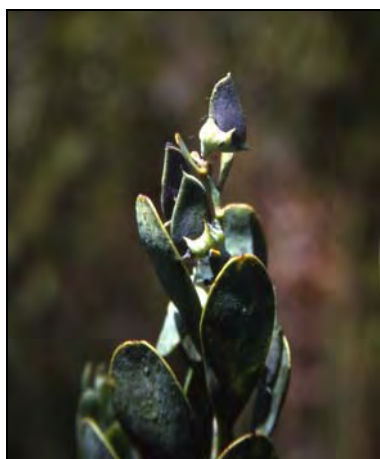


Photo: © Sarah Barrett (DEC)

Description

Distinctive, erect, slender shrub up to 1.5m high. Leaves erect and paddle-shaped. Flowers yellow and black. Fruits woody.

Distribution and Habitat

Endemic to South Coast region of WA and known from 11 small populations in Stirling Range NP and Fitzgerald River NP. Known from 2 populations in Fitzgerald

Biosphere, on Thumb Peak and Mid Mt Barren in Fitzgerald River NP, comprising c.500 mature plants. Extent of occurrence is approximately 500km² and the area of occupancy is estimated at 0.3km².

Favours stony or sandy loam but also grows on hill-slopes and outcrops.

Biology and Ecology

Flowers Sep-Oct. May mature at early age. Presumed to be hermaphroditic and bee-pollinated as for other *Daviesia* spp. which also set seed around 3 months after flowering. Seed high in starch and oil content and attractive to animals. May resprout after fire but also recruits from seed. Known to be susceptible to *Phytophthora cinnamomi*.

Threats

Phytophthora 'dieback'; insufficient intervals in wildfire events to allow seed bank regeneration; climate change and associated modification of habitat; small population size and risks associated with low genetic diversity and environmental stochasticity.

References

Department of the Environment, Water, Heritage and the Arts (2010). *Daviesia obovata* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra.
<http://www.environment.gov.au/sprat> - Accessed 8/4/2010

Threatened Species Scientific Committee (TSSC) (2008). *Commonwealth Listing Advice on Daviesia obovata*. Department of the Environment, Water, Heritage and the Arts.
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/17311-listing-advice.pdf> - Accessed 8/4/2010

Eremophila denticulata (subspecies *denticulata*) (Scrophulariaceae)
(Fitzgerald Eremophila)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Vulnerable**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Damien Rathbone (DEC)

Description

Erect shrub to 2.5m high. Leaves (50mm long) and stem resinous. Buds are orange-yellow and mature flowers are carmine-red, tubular and arranged on S-shaped stalks. Sepals 3.5-9mm long and lower corolla lip reflexed. Fruits ovoid (10-11 x 8-9mm) with 1-2 seeds. Leaf margins denticulate and prominently 'beaked' fruit, distinguishing it from *E. denticulata* subsp. *trisulcata*.

References

- Craig, G.F. & Coates, D.J. (2001) Declared and Poorly Known Flora in the Esperance District, Wildlife Management Program No 21. Department of Conservation and Land Management, Perth, Western Australia.
- Robinson, C.J. & Coates, D.J. (1995) Declared Rare and Poorly Known Flora in the Albany District, Wildlife Management Program No 20. Department of Conservation and Land Management, Perth, Western Australia.
- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Eremophila denticulata* subsp. *denticulata*. Department of the Environment, Water, Heritage and the Arts.
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/64569-conservation-advice.pdf> - Accessed 8/4/2010

Distribution and Habitat

The nominate form is known from 4 populations to the south and east of Ravensthorpe, 3 of which occur in Fitzgerald Biosphere. Approximate extent of occurrence is 70km² with c.5,000 mature plants, although this is likely to fluctuate with fire (S. Barrett, *pers. comm.*).

Recorded growing on both alluvial soils along riverbanks and sandy clay loam plains over granite geology. Favours tall open woodland over shrubland.

Biology and Ecology

Flowers Oct-Jan. Plants begin to senesce after 10 years. Regenerates in large numbers from soil-stored seed-bank after fire. Presumed not susceptible to *Phytophthora cinnamomi*.

Threats

Grazing/trampling by native and feral herbivores; competition from invasive weeds.

Eremophila subteretifolia

(Scrophulariaceae)

(Lake King *Eremophila*)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Critically Endangered**



Photo: © Sarah Barrett (DEC)

Description

Prostrate, mat-like plant up to 10cm high and 1.5m in diameter. Leaves glossy green. Flowers erect and orange in colouration.

Distribution and Habitat

Known from 8 populations in Lake King-Ravensthorpe area, 1 of which occurs in

Fitzgerald Biosphere, with an extent of occurrence of approximately 530km² and <50 mature individuals. Area of occupancy is estimated at 2ha.

Grows in slightly saline, light, sandy loam over clay and favours open woodland over open scrub and low sedge on margins of samphire flats and salt lakes. Grows under range of *Eucalyptus* spp.

Biology and Ecology

Flowers Jul-Mar (possibly throughout year). Probable disturbance opportunist. Presumed to be killed by fire and regenerates from soil-stored seed-bank.

Threats

Inappropriate fire regimes affecting recruitment and regeneration; increased salinity of habitat; modification/loss of habitat through recreational and vehicle activity; grazing by European Rabbit (*Oryctolagus cuniculus*); mining activity (specifically gypsum).

References

- Graham, M & Mitchell, M. (2000) Declared Rare Flora in the Katanning District. Department of Conservation and Land Management, Perth, Western Australia.
- Phillimore, R., Stack, G. & Brown, A. (2002) Lake King *Eremophila* (*Eremophila subteretifolia* ms) Interim Recovery Plan 2002-2005. Department of Conservation and Land Management, Perth, Western Australia.
- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Eremophila sp. subteretifolia* (K.R.Newbey 10924) WA Herbarium. Department of the Environment, Water, Heritage and the Arts. <http://www.environment.gov.au/biodiversity/threatened/species/pubs/82039-conservation-advice.pdf> - Accessed 8/4/2010

Eucalyptus burdettiana
(Burdett Gum)

(Myrtaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Endangered**



Photo: © Sarah Barrett (DEC)

Description

Multi-stemmed mallee or shrub to 4m high. Bark dark-grey over dark orange. Mature leaves (6-9 x 1-1.7cm) glossy green to blue-green, have a dense vein network and numerous small oil glands. Buds (4-5 x 0.7-1cm) have erect stamens. Flowers usually arranged in sessile clusters of 7-11 (on flattened peduncle with unfused hypanthia and long horn-shaped opercula) and are cream to yellow

References

- Robinson, C.J. & Coates, D.J. (1995) Declared Rare and Poorly Known Flora in the Albany District, Wildlife Management Program No 20. Department of Conservation and Land Management, Perth, Western Australia.
- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Eucalyptus burdettiana*. Department of the Environment, Water, Heritage and the Arts.
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/13505-conservation-advice.pdf> - Accessed 8/4/2010.

in colouration. Valves of fruit often united at tip and seeds black, irregular or ovoid in shape or sometimes flat or flanged.

Distribution and Habitat

Known from 1 population in Fitzgerald River NP of 4,000 individuals. Favours shallow sandy soils over quartzite geology and grows in association with other mallee species (*Eucalyptus* spp.). Occurs on slopes and ridges of mountains but 1 sub-population on roadside verge.

Biology and Ecology

Flowers intermittently throughout year, often Jan-Mar and July-Aug. Resprouts from lignotubers after fire or disturbance. Seedlings not observed to date. Susceptibility to *Phytophthora cinnamomi* unknown.

Threats

Inappropriate fire regimes; modification of habitat.

Eucalyptus coronata
(Crowned Mallee)

(Myrtaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Vulnerable**
- Western Australian Wildlife Conservation Act (1950): **Endangered**



Photo: © Sarah Barrett (DEC)

Description

Multi-stemmed mallee or shrub to 2.5m high. Leaves blue-green and 12 x 3cm. Buds 5cm long and 3cm in diameter, strongly ribbed and in threes on broad flattened stalk 1.5cm long. Fruits are large (5cm long) with broad disc crown-like protruding valves.

References

- Robinson, C.J. & Coates, D.J. (1995) Declared Rare and Poorly Known Flora in the Albany District, Wildlife Management Program No 20. Department of Conservation and Land Management, Perth, Western Australia.
- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Eucalyptus coronata*. Department of the Environment, Water, Heritage and the Arts.
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/2308-conservation-advice.pdf> - Accessed 8/4/2010

Distribution and Habitat

Known from 3 populations in Fitzgerald River NP with an estimated 2,000 individuals occurring over 47km², although total numbers have fluctuated with occurrence of wildfire.

Favours shallow soils over quartzite geology on slopes and summits of peaks in the east of Fitzgerald River NP.

Biology and Ecology

Flowers Jul-Aug. Resprouts from lignotubers following fire. Seedlings not observed to date. Susceptibility to *Phytophthora cinnamomi* unknown.

Threats

Inappropriate fire regimes; modification to habitat through road maintenance activity; potential risk from *Phytophthora* 'dieback'.

Eucalyptus nutans

(Myrtaceae)

(Bremer or Red-flowered Moort)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Not Listed**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Sarah Barrett (DEC)

Description

Erect mallet to 10m high. Leaves (52-73 x 34-48mm) ovate or orbicular and glossy dark green. Buds (9-15 x 4-5mm) obtusely conical and slightly warty with broad, strap-like down-curved peduncle. Flowers red (rarely cream). Fruit sessile and four-winged with descending valves

in wheel-like arrangement. Seed black and compressed obovoid to ovoid.

Distribution and Habitat

Restricted to single wild population near Bremer Bay in South Coast region of WA, with c.20,000 plants over several hectares. Has been cultivated elsewhere in WA (e.g. Perth and Albany).

Grows on gravelly-clay over spongolitic marine sediments near coast at Bremer Bay.

Biology and Ecology

Flowers Nov-Apr. Non-lignotuberous and killed by fire. Regenerates from canopy-stored seed (serotinous). Hybridises with *Eucalyptus occidentalis*. Only recently described as separate species from *Eucalyptus cernua*. Juvenile period unknown.

Threats

Insufficient intervals in wildfire events to allow seed bank regeneration.

References

McQuoid, N.K. & Hopper, S.D. (2007) The rediscovery of *Eucalyptus nutans* F. Muell. from the south coast of Western Australia, *Journal of the Royal Society of Western Australia*, 90: 41-45.

Eucalyptus purpurata

(Myrtaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Not Listed**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**

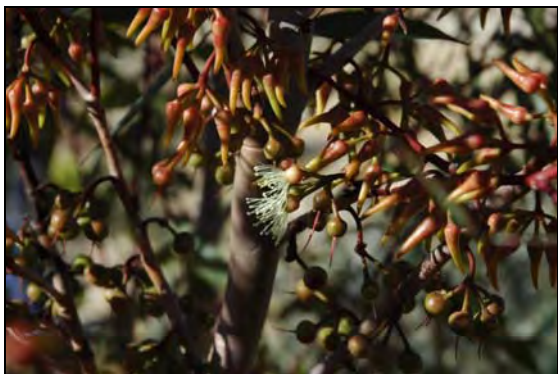


Photo: © Anne Cochrane (DEC)

Description

Erect mallet to 10m high. Bark dull grey over cream, smooth, decorticating into long strips. Flowers cream. Recently recognised as distinct species from *Eucalyptus argyphaea* and differs by red-

purple new growth and smaller buds and fruits.

Distribution and Habitat

Restricted to single population in 4 areas around Bandalup Hill near Ravensthorpe with an extent of occurrence of 16.5ha. Age classes of this population vary from c.19 to c.124 yrs.

Grows on white powdery loam over magnesite geology on eastern/north-eastern slopes and ridges.

Biology and Ecology

Flowers Nov. Fire sensitive species and regenerates from canopy-stored seed (serotinous).

Threats

Inappropriate fire regimes; habitat modification/loss due to mining activity.

References

- Department of Conservation and Land Management (2004) Proposed Change to the Database of Threatened Ecological Communities (TECs) – *Eucalyptus purpurata* woodlands on magnesite soils of the ridge-tops and upper slopes of the Ravensthorpe Range. Department of Conservation and Land Management, Perth, Western Australia. (Unpublished)
- Nicolle, D. (2002) Two new species of silver mallet (*Eucalyptus* – Myrtaceae) of very restricted distribution in south-western Western Australia. *Nuytsia* 15(1): 77-83
- Western Australian Herbarium (1998) Florabase - The Western Australia Flora, *Eucalyptus purpurata* D.Nicolle - <http://florabase.calm.wa.gov.au/browse/profile/20050> - Accessed 8/4/2010

Grevillea infundibularis
(Fan- or Funnel-leaved Grevillea)

(Proteaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Sarah Barrett (DEC)

Description

Sprawling or decumbent shrub to 1m high. Leaves are 3cm wide and hemispherical to fan-shaped, almost lacking stalks with the leaf-base clasping the stem with new leaves are conical in shape. Leaves denticulate with 8 large, short-pointed teeth on each leaf and are prominently veined. Flowers bright red and irregular, forming small terminal

raceme. Two forms may be distinguished which differ in habitat preferences as dune form has cuneate (not stem-clasping) leaves and a prostrate shape.

Distribution and Habitat

Endemic to central coastal region of Fitzgerald River NP around Mid-Mt Barren and Thumb Peak with 2 populations comprising c.5,500 mature plants. Prefers shallow sandy or loamy soils amongst quartzite boulders, in open shrub-mallee.

Biology and Ecology

Flowers irregularly throughout the year. Susceptibility to *Phytophthora cinnamomi* unknown. Killed by fire and regenerates from soil-stored seed-bank. Juvenile period of 4 yrs.

Threats

Inappropriate fire regimes; risk from *Phytophthora* 'dieback'.

References

- Australian Biological Resources Study (1995-2000) Flora of Australia, Volumes 16, 17A & 17B, Commonwealth of Australia - <http://www.anbg.gov.au/abrs/online-resources/flora/stddisplay.aspx?pnid=2753> – Accessed 8/4/2010
- Barrett, S., Comer, S., McQuoid, N., Porter, M., Tiller, C. & Utber, D. (2009) Identification and Conservation of Fire Sensitive Ecosystems and Species of the South Coast Natural Resource Management Region. Department of Environment and Conservation, South Coast Region, Western Australia.
- Robinson, C.J. & Coates, D.J. (1995) Declared Rare and Poorly Known Flora in the Albany District, Wildlife Management Program No 20. Department of Conservation and Land Management, Perth, Western Australia.
- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Grevillea infundibularis*. Department of the Environment, Water, Heritage and the Arts. <http://www.environment.gov.au/biodiversity/threatened/species/pubs/5772-conservation-advice.pdf> - Accessed 8/4/2010

Hibbertia abyssa
(Bandalup Buttercup)

(Dilleniaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Not Listed**
- Western Australian Wildlife Conservation Act (1950): **Critically Endangered**



Photo: © Damien Rathbone (DEC)

Description

Erect shrub up to 1.2m high and can be single- or multi-stemmed. Leaves linear to subulate with strongly recurved margins and pungent tips. Young branchlets have distinct glabrous ribs but covered in dense hairs between them. Flower bright yellow with five stamens on

one side of carpals and held on slender and glabrous stalks (6-14mm long). Sepal surface has hooked and branched hairs. May be confused with similar *Hibbertia mucronata* and *H. atrichosepala*.

Distribution and Habitat

Restricted to Bandalup Hill area near Ravensthorpe Range, where part of one population was cleared in 2008 through mining activity.

Occurs in shallow red-brown light clay in open mallee-shrubland.

Biology and Ecology

Flowering recorded in Oct, Nov and Mar. Observations suggest that it regenerates after fire from soil-stored seed. Susceptibility to *Phytophthora cinnamomi* unknown but other *Hibbertia* spp. can be susceptible.

Threats

Habitat modification/loss, dust impacts and changes to hydrology through mining activity; inappropriate fire regimes and post-fire competition from invasive weeds; risk from *Phytophthora* 'dieback'.

References

- Luu, R., Rathbone, D., Barrett, S & Cochrane, A. (2010) *Hibbertia abyssa* Interim Recovery Plan 2010-2015 (Draft). Department of Environment and Conservation, Perth, Western Australia.
- Wege, J. & Markey, A. (2009) A new, rare *Hibbertia* discovered on Bandalup Hill. Information Sheet 31/2009. Department of Environment and Conservation, Perth, Western Australia.
- Wege, J.A. & Thiele, K.R. (2009) Two new species of *Hibbertia* (Dilleniaceae) from near Ravensthorpe in Western Australia. *Nutysia* 19(2): 303-310.

Kunzea similis (subspecies *mediterranea*)

(Myrtaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Not Listed**
- Western Australian Wildlife Conservation Act (1950): **Endangered**



Photo: © Stephen Kern (DEC)

Description

Woody shrub to 3m high with several stiffly erect main stems, moderately to little branched. Basal branches prostrate and usually without flowers. Young branches densely covered in silky hairs. Flowers pink with prominent stamens and striking pale anthers. Distinguished from

nominate form by larger bracteoles (3.8-4.4mm) and with (usually) exposed apex often longer than hypanthium.

Distribution and Habitat

Confined to 1 population on Bandalup Hill, east of Ravensthorpe with extent of occurrence of 21.9ha. Surveys in 2007 found c.350,000 mature plants. Mining has removed 6% of population. Favours grey loamy sandy soil over laterite geology in open shrub mallee and dense heath.

Biology and Ecology

Flowers Sep-Nov. Killed by fire and regenerates from seed. Pollinated by native bees.

Threats

Habitat loss/modification through mining activity.

References

- Department of Environment and Conservation (2008) SAP 2008 *Kunzea similis* subsp. *mediterranea*. Department of Environment and Conservation, Perth, Western Australia. (Unpublished)
- Toelken, H.R. & Craig, G.F. (2007) *Kunzea acicularis*, *K. strigosa* and *K. similis* subsp *mediterranea* (Myrtaceae) – new taxa from near Ravensthorpe, Western Australia. *Nutysia* 17: 385-396.
- Western Australian Herbarium (1998) Florabase - The Western Australia Flora - *Kunzea similis* subsp. *mediterranea* Toelken & G.F.Craig - <http://florabase.calm.wa.gov.au/browse/profile/31151> - Accessed 9/4/2010

Kunzea similis (subspecies *similis*)

(Myrtaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Not Listed**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Sarah Barrett (DEC)

Description

Woody shrub to 1.5m. Similar to *K. similis* (subsp. *mediterranea*) but differs with smaller bracteoles (3.2-3.7mm) hidden between flowers and usually shorter than hypanthium.

Distribution and Habitat

References

Toelken, H.R. & Craig, G.F. (2007) *Kunzea acicularis*, *K. strigosa* and *K. similis* subsp *mediterranea* (Myrtaceae) – new taxa from near Ravensthorpe, Western Australia. *Nutysia* 17: 385-396.

Restricted to single location in Fitzgerald River NP at East Mt Barren near Hopetoun, with mature population of c.3,600.

Favours fine sandy-clay soil on quartzite wave-cut bench on lower slopes of East Mt Barren in low heath.

Biology and Ecology

Flowers Sep-Oct. Killed by fire and regenerates from seed. Poor regeneration after fire in 2006. Presumed susceptible to *Phytophthora cinnamomi*. Drought stress observed in February 2010 (S. Barrett & S. Cowen *pers. obs.*).

Threats

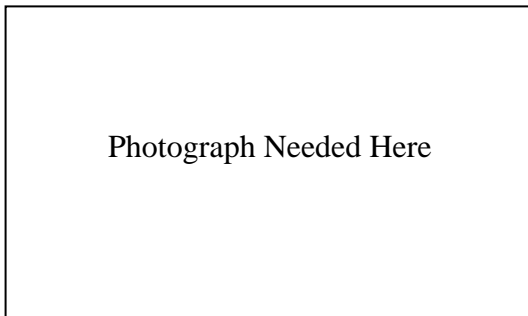
Insufficient intervals in wildfire events to allow seed bank regeneration; habitat modification through upgrade and maintenance of Hamersley Drive; drought.

Lepidium aschersonii
(Spiny Peppergrass)

(Brassicaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Vulnerable**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Description

Small, erect, perennial herb up to 30cm with intricate branched, erect stems covered in deflexed hairs. Branches become woodier and spicier with age or in dry conditions. Basal leaves (up to 12cm) are fleshy and pinnately lobed but rarely persist and stem leaves are lanceolate to narrowly tapering, hairy, becoming smaller with increasing height. Flowers small with four sepals 0.8mm long and are greenish in colour. Fruit (3.5-4.5 x 2.5-3mm) ovate to obovate two chambered pod borne on 2-4mm pedicel (hairy above, hairless below).

References

- Department of Sustainability and Environment (2009) Spiny Peppergrass *Lepidium aschersonii*, Action Statement – Flora and Fauna Guarantee Act 1988 No.111. Department of Sustainability and Environment, Melbourne, Victoria.
- Robinson, C.J. & Coates, D.J. (1995) Declared Rare and Poorly Known Flora in the Albany District, Wildlife Management Program No 20. Department of Conservation and Land Management, Perth, Western Australia.
- Western Australian Herbarium (1998) Florabase - The Western Australia Flora – *Lepidium aschersonii* Thell.
<http://florabase.calm.wa.gov.au/browse/profile/3019> - Accessed 9/4/2010

Distribution and Habitat

Occurs in fragmented populations in NSW and VIC where previously more widespread and was considered extinct in WA (when last recorded from Pallinup River in 1903) until 1976 when reported from Corackerup Creek.

Wetland species in eastern states preferring heavy black or clay soils in swamps and salt-marshes. In VIC critical habitat parameters related to seasonal flooding events and waterlogged soils.

Biology and Ecology

Flowers spring-autumn. Tolerant of a range of saline conditions. Highly productive seeder and regenerates prolifically during drought conditions, possibly due to greater soil exposure. May tolerate some levels of grazing pressure.

Threats

Modification/loss of habitat; grazing by feral/domestic herbivores; competition from invasive weeds; changes in hydrology.

Marianthus mollis
(Hairy-fruited *Marianthus*)

(Pittosporaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Stephen Kern (DEC)

Description

Low, spreading shrub up to 50cm high. Stems reddish-brown with white hairs when young but in mature plants are grey and hairless. Leaves (2 x 1.1cm) also lose their hairs with age (except on margins and mid-rib) and are almost sessile. Flowers usually solitary, deep blue in colouration with 3-4 distinct lines on each petal and pale throat, and held on slender stalks (1.5-2.5cm long) in leaf axils.

References

- Barrett, S., Comer, S., McQuoid, N., Porter, M., Tiller, C. & Utber, D. (2009) Identification and Conservation of Fire Sensitive Ecosystems and Species of the South Coast Natural Resource Management Region. Department of Environment and Conservation, South Coast Region, Western Australia.
- Hartley, R. & Barrett, S. (2005) Hairy-fruited *Marianthus* (*Marianthus mollis*) Recovery Plan. Department of Conservation and Land Management, Perth, Western Australia.

Distribution and Habitat

Confined to area of approximately 30ha in Ravensthorpe Range and eastwards along Rabbit Proof Fence, possibly sharing the same underlying geological feature. 6 populations comprise >50,000 individuals and area of occupancy estimated at 12ha. Is not highly specific in its habitat requirements but favours gravelly sands over laterite or ironstone geology and sand over laterite, preferring open mallee-heath with disturbed areas of soil.

Biology and Ecology

Flowers Aug-Sep, but also recorded flowering in summer. Regenerates prolifically after fire from soil-stored seed. Juvenile period is 3 yrs. Since flowers are small, self- or insect-pollination is most likely. Seed dispersal by animals. Probable soil-disturbance opportunist. Susceptibility to *Phytophthora cinnamomi* unknown.

Threats

Impacts from mining industry (e.g. loss of habitat, soil compaction, dust, weeds and pathogen introduction, increased fire risk and potential for introduction of poisonous chemicals).

Myoporum cordifolium
(Jerramungup *Myoporum*)

(Scrophulariaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Vulnerable**
- Western Australian Wildlife Conservation Act (1950): **Endangered**



Photo: © Sarah Barrett (DEC)

Description

Twiggy, spreading shrub up to 1m high. Leaves very small (2mm), dark green and heart-shaped. Stem warty and resinous. Flowers solitary and white with corolla tubes growing up to 5mm long with 5 lobes, which have prominent purple spotting. Fruit (1.5-2.5 x 1-2.2mm) brown or green and ovoid-oblong. Seed tiny, ovoid and white. Unique habit and shape within genus *Myoporum*.

Distribution and Habitat

Occurs between Ongerup and Jerramungup on south coast of WA. Extent of occurrence is approximately 1,550km² and 7 populations comprising c.9,000 individuals occur in Fitzgerald Biosphere.

Favours disturbed, open habitats over sandy loam or clay loam in mallee or moort areas where, prior to disturbance, open *Eucalyptus* spp. existed over an open or tall shrub understorey, including road verges. Can be scattered through mallee by flood events.

Biology and Ecology

Usually flowers Jun-Nov with juvenile period of 3 yrs but observed flowering in February 2010 in Fitzgerald River NP, 2 yrs after wildfire (S. Barrett, S. Comer & S. Cowen *pers. obs.*). Short-lived (c.10 yrs) but disturbance opportunist with fire, flood or other disturbance (e.g. 'chaining' for fire management/suppression) stimulating germination. Longevity of soil-stored seed suggested to be >30 yrs.

Threats

Loss/modification of habitat through land clearance or road maintenance activity; competition with invasive weeds; grazing by European Rabbit (*Oryctolagus cuniculus*); disturbance events.

References

- Barrett, S., Comer, S., McQuoid, N., Porter, M., Tiller, C. & Utber, D. (2009) Identification and Conservation of Fire Sensitive Ecosystems and Species of the South Coast Natural Resource Management Region. Department of Environment and Conservation, South Coast Region, Western Australia.
- Chinnock, R.J. (2007) *Eremophila* and Allied Genera: a monograph of the plant family Myoporaceae – 30: *Myoporum cordifolium*, pp156-159 – Rosenberg Publishing, Dural, New South Wales, Australia.
- Department of the Environment, Water, Heritage and the Arts (2010). *Myoporum cordifolium* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra.
<http://www.environment.gov.au/sprat> - Accessed 9/4/2010
- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Myoporum cordifolium*. Department of the Environment, Water, Heritage and the Arts.
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/24223-conservation-advice.pdf> - Accessed 9/4/2010

Ricinocarpus trichophorus
(Barrens Wedding-bush)

(Euphorbiaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Sarah Barrett (DEC)

Description

Erect, openly branching shrub up to 1.6m high. Leaves (25-80 x 1.5mm) dark green above and grey below. Stem covered in grey felt-like hairs. Buds also covered in dense ferruginous hairs. Flowers creamy-yellow to white, arranged in groups of 6-10 on a 2cm stalk at the end of a branch.

Distribution and Habitat

Occurs in disjunct populations along the south coast of WA, from Fitzgerald River NP to Lake Tay (east of Frank Hann NP)

References

- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Ricinocarpus trichophorus*. Department of the Environment, Water, Heritage and the Arts.
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/19931-conservation-advice.pdf> - Accessed 9/4/2010
- Western Australian Herbarium (1998) Florabase - The Western Australia Flora - *Ricinocarpus trichophorus* Muell.Arg.-
<http://florabase.calm.wa.gov.au/browse/profile/4702> - Accessed 9/4/2010

and Mts Beaumont and Heywood north-east of Esperance. 5 populations in Fitzgerald Biosphere comprising 4,500 individuals.

Favours sandy-clay loam along breakaways or watercourses among sandstone rocks.

Biology and Ecology

Flowers Mar-May and Aug-Nov. Killed by fire and regenerates from soil-stored seed. Thought to take four years to flower and seed although it was reproductive only 2 yrs post-fire in Fitzgerald River NP in February 2010 (S. Barrett & S. Cowen, *pers. obs.*). Also observed to be affected by drought. Susceptibility to *Phytophthora cinnamomi* unknown.

Threats

Loss/modification/fragmentation of habitat through land clearance; grazing by domestic and feral herbivores; competition with invasive weeds; inappropriate fire regimes; risk from *Phytophthora* 'dieback'.

Stylidium galioides

(Stylidiaceae)

(Yellow Mountain or Yellow Fitzgerald Triggerplant)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Vulnerable**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Sarah Barrett (DEC)

Description

Creeping to semi-scandent perennial herb up to 30cm high and spreading to 50cm diameter. Leaves (2.5-40 x 0.7-6mm) in whorls of 8+ at base and on trailing stems, the latter of which may be rooted at nodes. Inflorescences racemose and

flowers pale-yellow and clustered at branch ends.

Distribution and Habitat

Restricted to 3 populations in Fitzgerald River NP with an estimated 220 mature plants occurring over approximately 9km². Populations believed to be stable. Favours shallow gravelly soils over and among quartzite geology on slopes and summits, in heath, mallee and shrubland.

Biology and Ecology

Flowers Sep-Jan. Killed by fire and regenerates from soil-stored seed. Susceptibility to *Phytophthora cinnamomi* unknown. Juvenile period is <4 yrs.

Threats

Inappropriate fire regimes; modification of habitat due to recreational activities; risk from *Phytophthora* 'dieback'.

References

Barrett, S., Comer, S., McQuoid, N., Porter, M., Tiller, C. & Utber, D. (2009) Identification and Conservation of Fire Sensitive Ecosystems and Species of the South Coast Natural Resource Management Region. Department of Environment and Conservation, South Coast Region, Western Australia.

Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Stylidium galioides*. Department of the Environment, Water, Heritage and the Arts. <http://www.environment.gov.au/biodiversity/threatened/species/pubs/4666-conservation-advice.pdf> - Accessed 9/4/2010

Western Australian Herbarium (1998) Florabase - The Western Australia Flora - *Stylidium galioides* C.A.Gardner.- <http://florabase.dec.wa.gov.au/browse/profile/7730> - Accessed 9/4/2010

Thelymitra psammophila
(Sandplain Sun-orchid)

(Orchidaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Vulnerable**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**

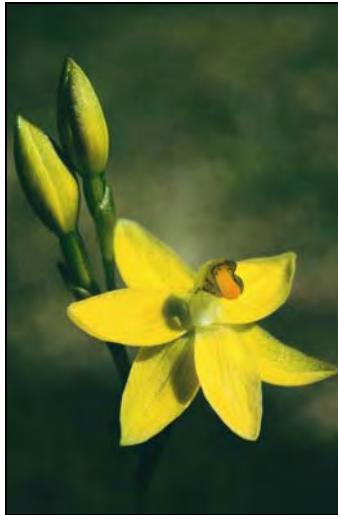


Photo: © Andrew Brown (DEC)

Description

Small, herbaceous perennial up to 25cm high. Leaves narrow and up to 8cm long. Flowers lemon-yellow and 18mm wide with 2 to 4 on each plant in a loose raceme. Column yellow with two

triangular, brown, lateral lobes. Backs of perianth segments tinged with red.

Distribution and Habitat

Restricted to 12 populations between Stirling Range NP and Ravensthorpe with an extent of occurrence of 10,000km². 8 populations occur in Fitzgerald Biosphere comprising c.400 individuals.

Favours wet sandy-clay soils in open heath and sedge.

Biology and Ecology

Flowers Sep-Oct. Tuberosus in association with a mycorrhizal fungus. Presumed not susceptible to *Phytophthora cinnamomi*. Vulnerable to fire during growing season.

Threats

Competition with invasive weeds; modification/loss of habitat through change of land use or clearance for industry, fire suppression and road maintenance; grazing by domestic stock; drought and inappropriate fire regimes (including season).

References

- Barrett, S., Comer, S., McQuoid, N., Porter, M., Tiller, C. & Utber, D. (2009) Identification and Conservation of Fire Sensitive Ecosystems and Species of the South Coast Natural Resource Management Region. Department of Environment and Conservation, South Coast Region, Western Australia.
- Department of the Environment, Water, Heritage and the Arts (2010). *Thelymitra psammophila* in Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra.
<http://www.environment.gov.au/sprat> - Accessed 12/4/2010
- Graham, M. & M. Mitchell (2000). *Declared Rare Flora in the Katanning District*. Western Australia Department of Conservation and Land Management.
http://www.dec.wa.gov.au/pdf/nature/flora/flora_mgt_plans/katanning/katanning_drf_mp25.pdf - Accessed 12/4/2010
- Robinson, C.J. & Coates, D.J. (1995) Declared Rare and Poorly Known Flora in the Albany District, Wildlife Management Program No 20. Department of Conservation and Land Management, Perth, Western Australia.
- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Thelymitra psammophila*. Department of the Environment, Water, Heritage and the Arts.
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/4908-conservation-advice.pdf> - Accessed 12/4/2010

Verticordia crebra

(Myrtaceae)

(Crowded or Twertup Featherflower)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Vulnerable**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Sarah Barrett (DEC)

Description

Small, spreading shrub to 75cm. Leaves 15mm long, dark-green and fine. Flowers yellow with 3mm long petals and unusually prominent yellow style and are

held in leaf axis towards ends of branches.

Distribution and Habitat

Endemic to Fitzgerald River NP and known from 4 populations with an estimated total population of 7,000. Approximate extent of occurrence is 150km². 1 population not surveyed since 1981 and number of plants not recorded then. Prefers heavy red-loam over spongolite on or above breakaways and drainage lines in open areas surrounded by scrub and mallee.

Biology and Ecology

Flowers May-Oct. Killed by fire and regenerates from soil-stored seed. Presumed to be susceptible to *Phytophthora cinnamomi*. Juvenile period is 29 months.

Threats

Insufficient intervals in wildfire events to allow seed bank regeneration; potential risk from *Phytophthora* 'dieback'; drought.

References

- Barrett, S., Comer, S., McQuoid, N., Porter, M., Tiller, C. & Utber, D. (2009) Identification and Conservation of Fire Sensitive Ecosystems and Species of the South Coast Natural Resource Management Region. Department of Environment and Conservation, South Coast Region, Western Australia.
- Environment Australia (EA) (2001). *Threat Abatement Plan for Dieback Caused by the Root-rot Fungus Phytophthora cinnamomi*.
<http://www.environment.gov.au/biodiversity/threatened/publications/tap/phytophthora.html> - Accessed 12/4/2010
- Robinson, C.J. & Coates, D.J. (1995) Declared Rare and Poorly Known Flora in the Albany District, Wildlife Management Program No 20. Department of Conservation and Land Management, Perth, Western Australia.
- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Verticordia crebra*. Department of the Environment, Water, Heritage and the Arts.
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/55678-conservation-advice.pdf> - Accessed 12/4/2010

Verticordia helichrysantha
(Coast Featherflower)

(Myrtaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Vulnerable**
- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Sarah Barrett (DEC)

Description

Small, sprawling shrub up to 20cm high. Leaves small (6mm long), linear with revolute margins. Flowers (7mm diameter) pale-yellow with minutely-dentate oval petals, a hairy calyx tube

(3mm long) and long, prominent, slightly hooked pale-pink style (15mm long).

Distribution and Habitat

Known from 5 current populations on south coast of WA, 1 of which occurs in Fitzgerald Biosphere, in Fitzgerald River NP, comprising c.35,000 plants.

Occurs in grey-brown sandy soils over laterite gravel over spongolite geology in low coastal heath.

Biology and Ecology

Flowers Sep-Oct. Killed by fire and regenerates from soil-stored seed. However, regenerates poorly after other disturbance. Presumed to be susceptible to *Phytophthora cinnamomi*. Juvenile period is >4 yrs.

Threats

Modification/loss of habitat through land clearance, road maintenance and recreational activities; high frequency wildfire events; risk from *Phytophthora* 'dieback'; drought.

References

- Barrett, S., Comer, S., McQuoid, N., Porter, M., Tiller, C. & Utber, D. (2009) Identification and Conservation of Fire Sensitive Ecosystems and Species of the South Coast Natural Resource Management Region. Department of Environment and Conservation, South Coast Region, Western Australia.
- Environment Australia (EA) (2001). *Threat Abatement Plan for Dieback Caused by the Root-rot Fungus Phytophthora cinnamomi*.
<http://www.environment.gov.au/biodiversity/threatened/publications/tap/phytophthora.html> - Accessed 12/4/2010
- Robinson, C.J. & Coates, D.J. (1995) Declared Rare and Poorly Known Flora in the Albany District, Wildlife Management Program No 20. Department of Conservation and Land Management, Perth, Western Australia.
- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Verticordia helichrysantha*. Department of the Environment, Water, Heritage and the Arts.
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/8204-conservation-advice.pdf> - Accessed 12/4/2010

Verticordia pityrhops
(Mount Barren Featherflower)

(Myrtaceae)

Conservation Status

- Environment Protection & Biodiversity Conservation Act (1999): **Endangered**
- Western Australian Wildlife Conservation Act (1950): **Endangered**



Photo: © Saul Cowen (DEC)

Description

Erect, single stemmed shrub up to 150cm high. Leaves 14mm, dark-green and fine. Flowers small and range from white to bright pink in colour with finely fringed sepals and petals and a honey-like scent.

Distribution and Habitat

Restricted to single population on southern slopes of East Mt Barren, near Hopetoun in Fitzgerald River NP. Approximately 3,000 mature individuals occur in this area.

Occurs in white sandy soil over and among quartzite geology on wave-cut bench approximately 100m above sea-level, in an open heath and shrubland community.

Biology and Ecology

Flowers Feb-Jun. Killed by fire and regenerates very slowly from soil-stored seed, e.g. no regeneration seen after 2006 in fire age vegetation (S. Barrett & S. Cowen *pers. obs.*). Juvenile period is 7 yrs. Presumed to be susceptible to *Phytophthora cinnamomi*.

Threats

High frequency wildfire events; habitat loss/modification due to upgrade of Hamersley Drive; risk from *Phytophthora* 'dieback'.

References

- Barrett, S., Comer, S., McQuoid, N., Porter, M., Tiller, C. & Utber, D. (2009) Identification and Conservation of Fire Sensitive Ecosystems and Species of the South Coast Natural Resource Management Region. Department of Environment and Conservation, South Coast Region, Western Australia.
- Robinson, C.J. & Coates, D.J. (1995) Declared Rare and Poorly Known Flora in the Albany District, Wildlife Management Program No 20. Department of Conservation and Land Management, Perth, Western Australia.
- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Verticordia pityrhops*. Department of the Environment, Water, Heritage and the Arts.
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/55798-conservation-advice.pdf> - Accessed 12/4/2010

Eucalyptus acies mallee-heath
(Central Barren Ranges – Fitzgerald River NP)

(Community)

Conservation Status

- Western Australian Wildlife Conservation Act (1950): **Vulnerable**



Photo: © Sarah Barrett (DEC)

Description

Mallee-heath dominated by *Eucalyptus acies* (Woolbernup Mallee), a straggly shrub or low mallee (up to 3m high) with broad, thick sub-opposite leaves, angular branchlets and rigidly down-curved inflorescences.

Distribution and Habitat

References

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Restricted to Central Barren Ranges in Fitzgerald River NP, specifically Thumb Peak, Mid-Mt Barren and Woolbernup.

Occurs on sandy skeletal soils on quartzite hills. Associated Declared Rare Flora* species are *Cooperookia georgei* (Endangered*), *Daviesia obovata* (Endangered*) and *Grevillea infundibularis* (Vulnerable*). *E. acies* listed as Priority 4* (Rare).

* WA Wildlife Conservation Act (1950)

Biology and Ecology

Community considered to be Vulnerable to infestation by the pathogen *Phytophthora cinnamomi* as is dominated by highly susceptible plant spp.

Also dominated by serotinous obligate seeders and therefore sensitive to fire.

Threats

Inappropriate fire regimes; risk from *Phytophthora* 'dieback'.