

Action Statement

Flora and Fauna Guarantee Act 1988

No. 218

Grampians Bitter-pea

Daviesia laevis

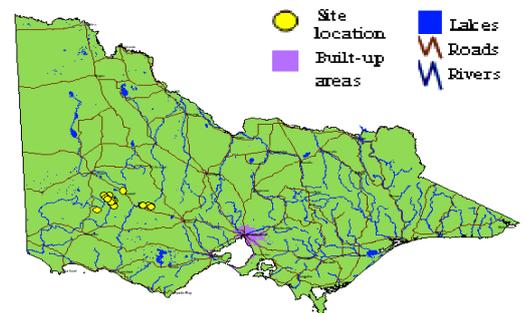
This Action Statement is based on a draft Recovery Plan prepared for this species by DSE under contract to the Australian Government Department of the Environment, Water, Heritage and the Arts.

Description

The Grampians Bitter-pea (*Daviesia laevis*) is a perennial, slender, erect shrub which grows to 2–4 m in height. It has hairless, somewhat glaucous branches with ascending to arching angular-terete branchlets. The phyllodes (modified leaves) are attached to 2–10 mm long stalk-like bases. The phyllodes are grey-green, leathery, linear to narrow, elliptic, slightly flexible and pointed at the end; the margins are entire and the midrib is prominent. A series of five to fifteen evenly spaced pea-flowers, 20–30 mm in length, are attached by 1.5–4 mm long pedicels to a peduncle, 2–10 mm in length. There are one to three inflorescences per axil. The inflorescence rachis is generally 20–30 mm long. The flower consists of a largely orange-yellow corolla and a depressed-ovate, orange-yellow standard with brownish-red markings. Flowering occurs from October to December. The fruits appear in January, and are straw to light-brown, strongly compressed, obliquely triangular to broadly triangular, and 7–10 mm in length and 5–6 mm in width. The mottled black and red-brown seeds are compressed ovoid, and approximately 2.5–3 mm long, 1.6–2 mm broad and 1 mm thick. (Description adapted from Crisp (1991) and Walsh and Entwisle (1996)).



Grampians Bitter-pea (Photo: DSE/Pritchard)



Distribution in Victoria
(Flora Information System DSE 2007)

Distribution

Little is known about the distribution of the Grampians Bitter-pea. Herbarium records indicate that the species was found in the Grampians, Mount Cole and Black Ranges in Western Victoria. Prior to searching in 2004, the most recent records were from the Grampians National Park at Bovine Creek (1998), and Mt Cole (1991).

Populations have been recorded from the Grampians (Mount Cassell, Grevillea Creek, Lake Wartook Road, Mt William, Stoney Creek Track, Mt Difficult Range, Long Gully Creek and Bovine Creek), Mt Cole State Park, Langi Ghiran State Park, Mt Buangor State Park and The Black Range State Park. In 2002, searches of known sites in the Grampians and at Langi Ghiran were undertaken as part of the development of a Recovery Plan for the species. Unfortunately there were no sightings of Grampians Bitter-pea.

Searches in 2004 identified populations at Langi Ghiran, both relocating the known site and extending the species' distribution. A seedling was found in 2004 in the Grampians on Silverband Falls Road, near the site of a previously observed adult plant which is no longer present.

Abundance

The current known abundance of the Grampians Bitter-pea is one seedling in the Grampians and approximately 30 plants at Langi Ghiran (of which at least eight are seedlings). It is hoped that more plants will be found following further searches in Langi Ghiran, the Grampians and other previously recorded locations. The species' former abundance is likely to have been in the thousands.

Important populations

Important populations necessary to the long term survival and recovery of the Grampians Bitter-pea are Grampians National Park, Mount Cole State Forest, Mount Buangor State Park, Black Range State Park and Langi Ghiran State Park.

Habitat

Few reports exist of Grampians Bitter-pea habitat. The species was initially described by Crisp (1991) who defined its habitat as protected montane sites such as gullies on sandstone or granite skeletal or sandy soils, sometimes amongst boulders and alongside creeks. Messmate Stringybark (*Eucalyptus obliqua*) and Grampians Grey-gum (*E. alaticaulis*) were reported to be the dominant species in an open forest where the Grampians Bitter-pea occurred along the borders of the forest and the adjacent Tea-tree (*Leptospermum*), Honey-myrtle (*Melaleuca*) and Saw-sedge (*Gahnia*) thicket. Searches undertaken for this species during the compilation of the National Recovery Plan were unsuccessful. This may be due to a lack of complete site data. The species has, however, been confirmed at two previously recorded sites.

The recent populations of Grampians Bitter-pea found at Langi Ghiran are in habitat quite different to that described previously. They are typically situated among south-facing granite outcrops, sparsely distributed and often amongst boulders.

The altitude at these sites is 800 - 900 m. Overstorey species include Messmate Stringybark (*Eucalyptus obliqua*), Bundy (*E. goniocalyx*) and Snow Gum (*E. pauciflora*). At the extreme of their range at Mt Langi Ghiran, plants have been observed in close proximity to Snow Gums. At lower altitudes, Blackwood (*Acacia melanoxylon*), Spike Wattle (*A. oxycedrus*) and Hedge Wattle (*A. paradoxa*) are also present, as well as ground covers including Grey Everlasting (*Ozothamnus obcordatus*), Soft Tussock-grass (*Poa morrisii*), Common Tussock-grass (*Poa labillardierei*), Spiny-headed Mat-rush (*Lomandra longifolia*) and Weeping Grass (*Microlaena stipoides*). Plants are predominately observed scattered through granitic boulders; these boulders potentially offer germinating seedlings some protection against grazing.

Life history and ecology

The biology and ecology of the Grampians Bitter-pea are poorly known. Herbarium records indicate that the species was frequently found in low numbers. There is some suggestion that the species regenerates well after fire, although there is currently no evidence to support this. Seedlings have been found in areas without recent fire activity (Langi Ghiran 2004), and an individual seedling was located at an unburnt site within the Grampians National Park. Populations located near Mt Langi Ghiran show an age structure consistent with a relatively short-lived species.

Conservation status

National conservation status

The Grampians Bitter-pea is listed as vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Victorian conservation status

Grampians Bitter-pea is listed as threatened under the Victorian *Flora and Fauna Guarantee Act 1988*.

It is considered vulnerable in Victoria according to DSE's *Advisory List of Rare or Threatened Plants in Victoria - 2005* (DSE 2005).

Potentially threatening processes

Crisp (1991) suggests that frequent burning at Mount Cole State Forest may have led to the decline of populations at this site. Intense browsing by macropods has been observed in this area (F. Coates pers. comm.), and there is evidence of browsing of seedlings at Mt Langi Ghiran. Fencing to exclude such herbivory will be considered if populations are found and protection from browsing deemed necessary. Cinnamon Fungus (*Phytophthora cinnamomi*) may be a risk at one of the sites in Langi Ghiran, near an area

previously used by hang glider enthusiasts, which shows potential signs of infection.

Small population size

The number of mature plants is low, and these plants occur in isolated populations. The presence of Cinnamon Fungus within the Grampians National Park is a direct threat to this species (N Reiter pers. comm. 2004). There is a lack of genetic variability within the Silverband Road population. The proximity of individuals to roadside and picnic areas may be an issue.

Inappropriate burning regimes

The effect of fire on this species is unknown. Crisp (1991) suggests that burning at Mount Cole has been too frequent. Conversely, burning at Langi Ghiran may be too infrequent. Prescribed fires are difficult to maintain at Mt Langi Ghiran and are unlikely to be implemented. Lightning strikes do

Long term objective

To ensure that the Grampians Bitter-pea can survive, flourish and retain its potential for evolutionary development in the wild.

Specific objectives, actions and targets

The intended management actions listed below are further elaborated in DSE's Actions for Biodiversity Conservation (ABC) system. Detailed information about the actions and locations, including priorities, is held in this system and will be provided annually to land managers and other authorities.

Objective I To increase knowledge of biology, ecology and management requirements

| <i>Action</i> | <i>Targets</i> | <i>Responsible</i> |
|---|--|---------------------|
| 1. Acquire baseline population data by conducting detailed field and desk top surveys including identification of the area and extent of the population; estimates of the number, size and structure of the population; and inference or estimation of population change. | <ul style="list-style-type: none"> ▪ Updated records on all state databases (Flora Information System, VROTPop and Herbarium). ▪ Target populations accurately mapped. | DSE, Parks Victoria |
| 2. Assess habitat characteristics and/or condition. Accurately survey known habitat and collect and analyse floristic and environmental information relevant to community ecology and condition. | <ul style="list-style-type: none"> ▪ Ecological requirements identified for the completion of essential life history stages, recruitment and dispersal. ▪ Core habitat mapped. | DSE |
| 3. Conduct survey to locate suitable habitat. Identify and survey potential / historical habitat, using ecological and bioclimatic information that may indicate habitat preference. | <ul style="list-style-type: none"> ▪ Predictive model for potential habitat developed and tested. | DSE |
| 4. Identify disturbance regimes to maintain habitat or promote regeneration and recruitment. | <ul style="list-style-type: none"> ▪ Preparation of management prescriptions for ecological burning at key sites. | DSE, Parks Victoria |

not appear to have been sufficient to carry fires in the past.

Timber harvesting

It is likely that timber harvesting at Mount Cole could stress existing populations if they are found in close proximity to such activity.

Browsing by macropods

Browsing by macropods is a possible risk to seedling recruitment.

Previous management action

- Seed collected and stored for propagation.
- Plants (including seedlings) monitored and tagged.
- Potential habitat surveyed.

| | | |
|---|--|-------------------------------|
| 5. Undertake research to identify key biological functions. Evaluate current reproductive/regenerative status, seed bank status and longevity, fecundity and recruitment levels by conducting field-based experimental trials. Determine seed germination requirements by conducting laboratory and field trials aimed to identify key stimuli, and determine stimuli for vegetative regeneration | <ul style="list-style-type: none"> ▪ Seed bank/regenerative potential quantified for target populations. ▪ Stimuli for recruitment/regeneration identified. ▪ Management strategies identified to maintain, enhance or restore regenerative processes fundamental to reproduction and survival. | DSE, Royal Botanic Gardens |
| 6. Analyse population trends. Measure population trends and responses against recovery actions by collecting demographic information including recruitment and mortality, timing of life history stages and morphological data. Collate, analyse and report on census data and compare with management histories. | <ul style="list-style-type: none"> ▪ Techniques for monitoring developed and implemented. ▪ Census data for target populations. ▪ Population growth rates determined. ▪ Population Viability Analysis completed for targeted populations. | DSE |

Objective II To secure populations or habitat from potentially incompatible land use or catastrophic loss.

| <i>Action</i> | <i>Targets</i> | <i>Responsible</i> |
|--|--|------------------------|
| 7. Establish Management Areas or Special Protection Zones. | <ul style="list-style-type: none"> ▪ Formal conservation measures (e.g. Special Protection Zone) established for Mount Cole State Forest. | DSE |
| 8. Develop, provide input to or implement park, reserve or land management plan. | <ul style="list-style-type: none"> ▪ Appropriate recognition of populations and habitat in management plans for Grampians National Park, Mount Cole State Park and Mount Langi-Ghiran State Park. | DSE, Parks Victoria |
| 9. Establish cultivated plants <i>ex situ</i> to safeguard from the unforeseen destruction of the wild population. | <ul style="list-style-type: none"> ▪ Development of effective propagation and cultivation techniques. ▪ At least 25 mature plants in cultivation. | Royal Botanic Gardens |

Objective III To improve the condition of habitat

| <i>Action</i> | <i>Targets</i> | <i>Responsible</i> |
|--|--|------------------------|
| 10. Erect /maintain cages, fences or other structures to exclude native animals. Control threats once determined. Consider caging juvenile plants in areas where browsing is a known or perceived threat | <ul style="list-style-type: none"> ▪ Measurable seedling recruitment/vegetative regeneration at all known sites. ▪ Measurable reduction in plant mortality at all known sites. | DSE, Parks Victoria |

Objective IV To increase the number of populations or individuals

| <i>Action</i> | <i>Targets</i> | <i>Responsible</i> |
|--|--|-------------------------------|
| 11. Store reproductive material. Establish a seed bank | <ul style="list-style-type: none"> ▪ Long-term storage facility identified. ▪ Seed from target populations in storage. | DSE, Royal Botanic Gardens |
| 12. Determine seed viability. | <ul style="list-style-type: none"> ▪ Seed viability determined. | Royal Botanic Gardens |
| 13. Prepare a plan for reintroduction / translocation. Determine feasibility and select sites. | <ul style="list-style-type: none"> ▪ Translocation plan completed. | DSE |

| | | |
|--|--|----------------------------------|
| 14. Establish and maintain a reintroduced / translocated population. Prepare site(s) to achieve maximum survival of translocated plants and implement translocation plan. Maintain and monitor translocated plants | <ul style="list-style-type: none"> ▪ Development of successful translocation techniques. ▪ At least 40% survival of translocated plants. | DSE, Royal Botanic Gardens |
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Objective V To increase community awareness and support

| <i>Action</i> | <i>Targets</i> | <i>Responsible</i> |
|---|---|--------------------|
| 15. Involve community groups and volunteers in recovery activities. | <ul style="list-style-type: none"> ▪ Opportunities for involvement identified, promoted and supported. | DSE |

References

- Australian and New Zealand Conservation Council and Biological Diversity Advisory Committee (2001) 'Biodiversity Conservation Research: Australia's Priorities.' Environment Australia, Canberra.
- Crisp MD (1991) Contributions towards a revision of *Daviesia* Smith (Fabaceae: Mirbelieae). 11. The *D. latifolia* group. *Australian Systematic Botany* 4, 284-286.
- DSE (2005) *Advisory List of Rare or Threatened Plants in Victoria - 2005*. Department of Sustainability and Environment, East Melbourne, Victoria.
- Environment Australia (2000) 'Revision of the Interim Biogeographic Regionalisation of Australia (IBRA) and the Development of Version 5.1. - Summary Report.' Department of Environment and Heritage, Canberra.
- International Union for the Conservation of Nature (2001) 'IUCN Red List Categories and Criteria: Version 3.1.' (IUCN: Gland)
- Walsh NJ, Entwisle TJ (1996) 'Flora of Victoria.' (Inkata Press: Melbourne)

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