

Action Statement

Flora and Fauna Guarantee Act 1988

No. 137

Basalt Greenhood

Pterostylis basaltica

Description and distribution

The Basalt Greenhood (*Pterostylis basaltica* D.L. Jones & M.L. Clements, *Muelleria* 8:75 (1993)) is a summer dormant terrestrial orchid, 9-25 cm tall, slender to moderately stout with 3-5 closely sheathing, ovate-lanceolate, acuminate stem leaves. Rosette leaf 8-15 elliptic, 1.5-2.8 cm long, 6-9 mm wide, usually withered by time of flowering. Flowers 1-15, to 1.4 cm long, translucent white with green and brown stripes and suffusions; dorsal sepal straight or up-curved with a filiform point 6-9mm long; lateral sepals deflexed and joined near the base, ovate and shallowly concave with slightly incurved margins having short white basal cilia; lateral sepals narrow to free, points up to 20mm long, deflexed and running nearly parallel, spreading apart at the tips; labellum narrowly ovate, generally 4.5-5.5mm long and about 3 mm wide, brownish green, fleshy and channelled with 6-8 pairs of distinctive coarse white marginal hairs to 3 mm long; basal lobe swollen, whitish, with 4 short hairs about 1.5 mm long (Jones & Clements 1993, Backhouse & Jeanes 1995, Walsh & Entwisle 1994).

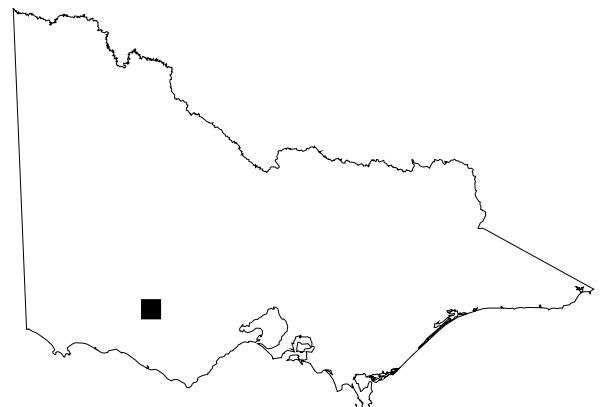
The Basalt Greenhood has a very localised distribution and considered to be endemic to western basalt plains grassland in south western Victoria (Jones & Clements 1993, SAC 1994). It is now only known from one locality in western Victoria, growing amongst basalt rocks, on 'stony rises', in native grassland (Kirkpatrick *et al.* 1995).

Habitat

The current classification of the community is Ecological Vegetation Class (EVC) 649 Stony Knoll Shrubland/Plains Grassy Woodland/ Plains Grassy



Basalt Greenhood *Pterostylis basaltica*
(Photo: Yvonne Ingeme)



Distribution in Victoria (DSE 2004)

Wetland (VicRFASC 1999), which is listed as an endangered and priority EVC (GHCMA 2000). It has also been referred to as 'Plains Stony Knoll Shrubland/Grassland - no. 16' by Frood (1998) and as 'Stony Rise Kangaroo Grassland (Community B3)' by Kirkpatrick *et al.* (1995) and McDougall *et al.* (1995). The vegetation is characterised as a tussock grassland, shrubland or low open woodland with Acacia species, which may include *A. paradoxa*, *A. melanoxylon* and *A. mearnsii*. Other species may include *Allocasuarina verticillata*, *Bursaria spinosa*, *Hymenanthera dentata* and rarely *Banksia marginata*. The ground flora is dominated by *Themeda triandra*, *Austrodanthonia* spp. *Austrostipa* spp., and a diverse range of forbs (Frood 1998). In the annually burnt areas *Chrysocephalum apiculatum* may also dominate (Kirkpatrick *et al.* 1995). At this stage, the orchid is known to occur in the 500 – 700 mm rainfall distribution.

The Basalt Greenhood occupies a very narrow habitat range within the 'stony rise', occurring in shallow soil overlying or surrounding basalt rocks. The specific habitat occupied by the orchid is dominated by a mixture of bare soil and a variety of mosses and occasionally small ferns. The vegetation becomes dominated by *Themeda triandra* and *Chrysocephalum apiculatum* further from the edge of the rocks as the soils become slightly deeper.

Three other *Pterostylis* species also occur at the main Basalt Greenhood site, these include *Pterostylis* sp. aff. *bicolor* (which is also very significant and threatened), *Pterostylis. mutica*, *Pterostylis. cynocephala* (Kirkpatrick *et al.* 1995) and *Pterostylis. sp. aff. cynocephala* (A. Pritchard *pers. comm.*).

Life history and ecology

Basalt Greenhood commences growth late summer/early autumn in anticipation of autumn rains. The summer dormant 'mother tuber' is replaced during the growing season by a replacement tuber and the 'mother tuber' then dies (G.W.Carr *pers. comm.*). The rosette of the orchid actively grows between May and September/October, then it begins to lose its colour and wither. At the same time the flowering stem begins to grow. It flowers between November and January depending on the season (Jones & Clement 1993).

'Rufa' group species are pollinated by small flies. Male fungus gnats have been observed landing on the labellum of Rufa group of *Pterostylis* with their genitalia exposed (David Jones *pers.comm.*). Prior to this pollinators were thought to be attracted by the smell of decomposing material that the orchid emitted as a pheromone.

Conservation status

National conservation status Endangered (ANZECC 1999)

Victorian conservation status endangered (DSE 2003)

Pterostylis basaltica has been listed as 'Endangered' under the Commonwealth **Environment Protection and Biodiversity Conservation Act 1999** and threatened under the **Flora and Fauna Guarantee Act 1988**.

Decline and threats

The Basalt Greenhood was first collected in 1989 (Goss *et al.* 1990) (this population is now believed to be extinct), but was not described until 1993. Searches have occurred since it was first discovered, three populations have since been discovered, a large population on a roadside and a small population on private land consisting of 5 plants located within 3 kilometres of the large population (DSE 2004b).

It is believed that the Basalt Greenhood would have been more wide spread than current records suggest. Suitable habitat may have existed in stony rise country from Colac to Nerrin Nerrin and south west to Port Fairy. Unfortunately much of this suitable habitat has been lost through agricultural activities including application of fertilisers and sowing introduced pasture species and heavy grazing by stock and rabbits. The threat posed by intensive agricultural activities will increase as aerial sowing of pasture and fertiliser becomes more wide spread.

The decline of this orchid's habitat is reflected in the overall decline of the Western Basalt Plains Grasslands (CNR 1994). No population of Basalt Greenhood has been located within conservation reserves.

Weed invasion poses a serious threat to the survival of the Basalt Greenhood. The Basalt Greenhood occurs in a very restricted and limited ecological niche within the stony rise, which is particularly vulnerable to weed invasion, especially by introduced annuals. Activities that promote weed invasion are therefore a threat, this includes road works, road maintenance, droving of stock and spraying for fire-breaks.

The orchid also suffers from vertebrate and invertebrate predation. Illegal orchid collection is regarded as a strong potential threat as the location of the site has already been made public.

Other ecological processes are also impacting on the orchid's conservation. The orchid exists in such a restricted habitat range that natural pollination is probably an extremely rare event, or its pollinator may not be present in sufficient

numbers to ensure adequate pollination rates. Very little natural seed production has been evident over the last few years of monitoring.

Natural catastrophes could also spell disaster to the species as the majority of the population is growing in the two small locations.

Existing conservation measures

- The road reserve containing the Basalt Greenhood population has been listed on the National Estate for its Natural Heritage Values (AHC 1995). The road reserve is signposted with VicRoads 'Significant Native Vegetation' signs.
- Detailed population monitoring of the site has occurred since 1996. Population numbers appear to have slightly increased with evidence of some seedling recruitment, but very little natural seed production has been found. The orchids are most likely increasing by the establishment of multiple daughter tubers.
- Hand pollination of suitable healthy individual plants has occurred since the 1999/2000 season and the resulting seed capsules have been collected. Some of the seeds were dispersed at the 2 wild populations and the remaining seed was put into storage for other propagation purposes.
- Weed control, funded by Endangered Species Program, was undertaken. This involved both spot-spraying of weeds such as *Phalaris* growing in close proximity to the site as well as sensitive hand weeding of many of the invasive introduced annuals growing within the site, this often involved cutting off the seeding heads to prevent disturbance to the soil. Some of the most threatening species include *Vulpia* sp., *Briza* sp, *Avena* sp.
- The burning of the road reserve population by the local Rural Fire Brigade has occurred in consultation with NRE. In 1997, the Rural Fire Brigade was awarded a 'Certificate of Distinction' as part of the Landcare Awards for their assistance in managing both the population of Basalt Greenhood and the significant grassland remnant on the roadside.
- Searching and surveying for the Basalt Greenhood continues to be conducted on both public and private land, funded by the Endangered Species Program. A very small population of only five plants of the Basalt Greenhood was located on private land during the 1998 survey. Another new population located on the same road reserve but 1.4km from the existing site was found in 2000
- Adjoining landholder to the main population has established an internal laneway system

reducing the amount of movement of stock on the road reserve and soil disturbance.

- Successful translocation trials have been undertaken.
- Ex situ conservation trials are being conducted at the Melbourne Royal Botanic Gardens, initial results with Basalt Greenhood seed being sown onto mycorrhiza isolated from the orchid collars are encouraging.
- The Museum of Victoria has carried out some invertebrate survey work, spanning the four seasons, on the road side with the main population (Yen *et al.* 1994, Yen *et al.* 1995)

Conservation objectives

Long term objective

To achieve a down listing from endangered to vulnerable or lower within the next 10 years

Objectives of this Action Statement

1. Protect and increase the population numbers at the existing populations
2. Determine the habitat, distribution and abundance of the Basalt Greenhood
3. Identify potential relocation sites for new populations within public and private land tenures.
4. Establish the Basalt Greenhood in cultivation and establish new populations, including translocation
5. Investigate factors affecting plant recruitment and population viability

Intended management actions

The intended management actions listed below are further elaborated in DSE's Actions For Biodiversity Conservation database. 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.

Protection and enhancement of existing populations

1. Provide information and advice, including maps, regarding the location and management of Basalt Greenhood sites to landholders, land managers and other authorities, especially Catchment Management Authorities and local government authorities.

Responsibility: DSE (SW Region)

2. Incorporate actions to protect the Basalt Greenhood into the Glenelg Hopkins Regional Catchment Strategy or its subordinate

strategies via the relevant Biodiversity Action Plans. Implement these actions, according to priority, as resources become available, in conjunction with other agencies, community groups and landholders.

Responsibility: Glenelg Hopkins Catchment Management Authority

3. Incorporate information regarding the location and management of Basalt Greenhood sites into local planning schemes, including environmental significance overlays, and apply the Victorian Planning Provisions so as to protect these sites.

Responsibility: Moyne Shire Council

4. Negotiate a formal agreement to protect the populations on road reserves.

Responsibility: DSE (SW Region), Moyne Shire Council

5. Develop and implement a weed control plan will be for the main population site. It will involve a full evaluation of the weed flora on site as well as an evaluation of all weed management options, taking into consideration the species involved, population sizes, locations, proximity to the orchids, etc..

Responsibility: DSE (SW Region), Moyne Shire Council

Search suitable habitat for further populations

6. Determine habitat preferences, identify potential suitable habitat and conduct searches in an effort to locate additional populations. Searches will target private land, and the assistance of landholders and the community will be sought. An information brochure on the Basalt Greenhood will be prepared to publicise the plight of the species and encourage community participation in searches and protection.

Responsibility: DSE (SW Region), Glenelg Hopkins Catchment Management Authority.

Establish Basalt Greenhood in cultivation

7. Undertake hand pollination of wild populations and collected seed for propagation by the Royal Botanic Gardens.

Responsibility: DSE (SW Region)

Monitoring, research and information management

8. Continue to monitor populations, collecting information on total number of plants, number of flowering plants and pollination success/seed pod development. Photo points will also be established at the site which will provide more useful information on

recruitment success and orchid development. A monitoring protocol, specifically dealing with this site, the Basalt Greenhood and the other *Pterostylis* populations will also be prepared to ensure protection of the populations whilst undertaking the monitoring.

Responsibility: DSE (SW Region), Australasian Native Orchid Society, Hamilton Field Naturalists Club.

9. Investigate the feasibility of, and options for, establishment of new populations of Basalt Greenhood at secure sites.

Responsibility. DSE (SW Region, Biodiversity & Natural Resources Division)

10. Undertake and/or support research, including the following priorities:

- specific ecological conditions required for natural regeneration
- mycorrhizal fungi association
- genetic health and viability of the remnant populations
- ecological tolerances
- identity and habitat requirements of the pollinator
- moisture trials, in relation to flowering, seeding and seedling recruitment

Responsibility. DSE (Biodiversity & Natural Resources Division)

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Further information can be obtained from
Department of Sustainability and Environment
Customer Service Centre on 136 186.

Flora and Fauna Guarantee Action Statements are
available from the Department of Sustainability and
Environment website: <http://www.dse.vic.gov.au>

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