

Pterostylis setifera Bristly Greenhood

Taxonomy

Pterostylis setifera M.A. Clem., Matthias & D.L. Jones

The taxon forms sporadic hybrids with *Pterostylis boormanii* (VicFlora, 2018).

Current conservation status

Categorised as Rare in the 2014 Advisory list of rare or threatened flora (DEPI 2014).

Proposed conservation status

Endangered in Victoria

Criteria A2ace+4ace; B1ab(iii,v)+2ab(iii,v); C2a(i)

Species Information

Description and Life History

The taxon is a flowering plant to 30 cm tall, stem leaves 5-8, closely sheathing. Rosette leaves 5-10, obovate to oblong, 2-4 cm long, 6-12 mm wide, margins glabrous or minutely ciliate. Flowers 2-10, erect, c. 1.8 cm long, transparent with green and light brown suffusions; dorsal sepal with an upcurved filiform point 4-5 mm long; lateral sepals deflexed, conjoined part elliptic in outline when flattened, shallowly concave, margins flat, ciliate, free points filamentous, 7-10 mm long, curved or hooked forwards, divergent, c. 12 mm apart at the tips; petals with a well-developed proximal flange nearly blocking off the base of the galea. Labellum lanceolate, 4-4.5 mm long, 2-2.5 mm wide, thick, protruding prominently; marginal hairs in 10-15 pairs, 1-4.5 mm long, white, spreading; basal lobe hardly raised, with numerous white hairs to 1.5 mm long. The taxon flowers from September to December (VicFlora 2018).

Most subpopulations have low numbers of flowering plants each year, with some subpopulations not flowering in dry years.

Generation Length

The generation length of *Pterostylis setifera* is estimated to be 20 to 40 (midpoint 30) years. Generation time for non-colonial terrestrial orchids is estimated to be a nominal 30 years based on the annual replacement of the mother tuber by daughter tubers. Whilst somatically immortal, each individual is susceptible to endogenous exhaustion or environmental causes of mortality at rates likely to result in replacement at intervals of several decades only. Such orchids are classed as obligate seed regenerators as they are reliant on seed-based recruitment for population maintenance.

Distribution

The taxon occurs in north central and western Victoria, from Rushworth to Stawell (Backhouse *et al.* 2016; VicFlora 2018). A generally rare taxon, it is known only from a few widely separated, general small subpopulations. However, its small pale flowers make it surprisingly difficult to find in the field, and it may be underreported.

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Habitat

The taxon grows in mallee and dry Box-Ironbark forest, on fairly heavy well-drained clay loam, often gravelly soils. The altitude ranges from 150-240 metres above sea level (Backhouse *et al.*, 2016; VicFlora, 2018). In central Victoria, it can be encountered growing on the margins of the patches of mallee eucalypts scattered through the surrounding box ironbark forest. The taxon usually grows in mixed populations with several other rustyhood *Pterostylis* spp.

Threats

There has almost certainly been a historic decline in distribution and abundance from widespread loss and degradation of habitat through clearing, weed invasion and extensive disturbance from gold-mining and eucalyptus oil production, that has most likely resulted in the loss of subpopulations. Remaining subpopulations are mostly small and highly fragmented. Subpopulations and habitat are considered at risk from disturbance, weed invasion and increasingly dry conditions from declining rainfall. Several groups of plants occur at sites that are still subject to harvesting of mallee gums for eucalyptus oil production. Very small subpopulations are highly susceptible to stochastic events causing major decline or local extinction within a very short time frame.

IUCN Criteria

Criterion A. Population size reduction. Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	Critically Endangered	Endangered	Vulnerable
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3, A4	≥ 80%	≥ 50%	≥ 30%

<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.</p> <p>A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3]</p> <p>A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.</p>	<p>based on any of the following:</p>	<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>
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Evidence:

Eligible under Criterion A2 as Endangered

The population reduction over the past 60 to 120 years is inferred to be 40 to 50%, based on (a), (c) and (e) above. Past decline is based on a loss of subpopulations and extensive loss and degradation of habitat.

The causes of the reduction may not have ceased, be understood or be reversible.

Eligible under Criterion A4 as Endangered

The population reduction over any 60 to 120 year period, including both past and future (up to 100 years in the future), is inferred to be 10 to 50%, based on (a), (c) and (e) above.

Future decline is based on ongoing disturbance at several subpopulation localities and habitat degradation.

Criterion B. Geographic range in the form of either B1 (extent of occurrence) and/or B2 (area of occupancy)			
	Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited
B1. Extent of occurrence (EOO)	< 100 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
AND at least 2 of the following 3 conditions:			
(a) Severely fragmented OR Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

Evidence:

Eligible under Criterion B1 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 1,473 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to have 1 location based on the uniform impact of the identified threats in the central Victorian goldfields where all subpopulations occur.

The taxon is estimated to be severely fragmented, based on its limited dispersal ability, the barriers to dispersal and/or the lack of habitat separating them. Such fragmentation precludes the possibility of recolonisation in the event of local extinction.

The taxon is estimated to have a continuing decline in (iii) and (v) above, based on the current and projected impact of the identified threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 52 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, the taxon is severely fragmented, has 1 location and has a continuing decline in (iii) and (v) above.

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Criterion C. Small Population size and decline		Critically Endangered	Endangered	Vulnerable
Number of mature individuals		< 250	< 2,500	< 10,000
AND at least one of C1 or C2				
C1	An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future):	25% in 3 years or 1 generation (whichever is longer)	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)
C2	An observed, estimated, projected or inferred continuing decline AND least 1 of the following 3 conditions:			
(a)	(i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
	(ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%
(b)	Extreme fluctuations in the number of mature individuals			

Evidence:

Eligible under Criterion C2 as Endangered

It is estimated that there are 560 to 1,250 mature individuals, based on sporadic surveys and VBA records.

The number of mature individuals is projected to continue to decline, based on ongoing disturbance at several subpopulation localities, and habitat degradation.

The estimated number of mature individuals in each subpopulation is fewer than 250.

Criterion D. Very small or restricted populations		Critically Endangered	Endangered	Vulnerable
Number of mature individuals (observed or estimated)		< 50	< 250	< 1,000
D2. Only applies to the VU category Restricted area of occupancy or number of locations with a plausible future threat that could drive the species to critically endangered or Extinct in a very short time.		-	-	D2. Typically: AaO < 20 km ² or number of locations ≤ 5

Evidence:

Eligible under criterion D as Vulnerable

The taxon is estimated to be very restricted.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

References

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