Threatened Species Assessment

Pterostylis laxa
Antelope Greenhood

Taxonomy

Pterostylis laxa Blackmore

The taxon is known to hybridise with *P. fischii* where the two species grow together (VicFlora 2015).

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 B2ab(iii,v); C2a(i)

Species Information

Description and Life History

The taxon is a flowering plant to 40 cm tall, stem leaves 3-5. Rosette leaves 3-5, ovate, 1.2-2.5 cm long, 0.8-1.6 cm wide, petiolate, margins entire. Flower 2-2.5 cm long, partially nodding, green and white with dark green or brown suffusions in the galea; dorsal sepal with a filiform point to 8-18 mm long; petal margins slightly flared; lateral sepals erect, tightly embracing the galea, sinus flat, notched in the middle, protruding in a shallow curve when viewed from the side, free points 3-3.5 cm long, filiform, spreading, usually recurved or lax. Labellum ovate-lanceolate, obtuse, 10-13 mm long, 2.5-4 mm wide, dark red-brown, the distal quarter to third protruding prominently from the sinus in the set position. The taxon flowers from February to May (VicFlora, 2015).

The taxon is one of a suite of late summer/autumn flowering cauline *Pterostylis* taxa from the highlands of eastern Victoria, and often grows in mixed populations with *P. aestova, P. atrans, P. coccina, P. decurva* and *P. fischii.* Some populations can be fairly large, containing hundreds of plants, but even in years of food rainfall only a small proportion will flower.

Generation Length

The generation length of *Pterostylis laxa* 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 is restricted to a small area in the montane forests of far eastern and north-eastern Victoria. It also occurs in New South Wales and the Australian Capital Territory (Backhouse *et al.* 2016; VicFlora 2015). The altitude ranges from 500-1,200 metres above sea level. It appears to be an uncommon orchid that is known from only a few sites, but given its rugged, poorly accessible mountainous habitat, the taxon is undoubtedly under-reported, and is probably more common than current records suggest (Backhouse *et al*. 2016).

Habitat

The taxon grows in damp, shady sites in open grassy and shrubby montane forests of north-eastern Victoria, on well-drained clay loam soils (Backhouse *et al*, 2016; VicFlora 2015).

Threats

There has been some decline in existing subpopulations, especially in the Cobberas region, from disturbance by domestic cattle and especially feral horses and also by severe summer bushfires (during the period when this taxon normally flowers). Most habitat is protected in reserves. There is likely to be some ongoing decline in some subpopulations from damage from feral horses, and increasingly dry conditions due to declining rainfall and a subsequent increase in severity and intensity of bushfires. 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%

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

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.

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*]

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.

based on any of the following:

(a) direct observation [*except A3*]

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Evidence:

Eligible under Criterion A2 as Vulnerable

The population reduction over the past 60 to 120 years is inferred to be 20 to 45%, based on (a), (c) and (e) above.

Past decline is based on declines in several subpopulations and habitat.

Eligible under Criterion A4 as Vulnerable

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 45%, based on (a), (c) and (e) above.

Past decline is based on declines in several subpopulations and habitat, and future decline is based on ongoing habitat disturbance at several localities.

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 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²
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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 104 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

It has a continuing decline in (iii) and (v) above based on the current and projected impact of the identified threats.

It is estimated to have 1 location. The mountains of north-eastern and far eastern Victoria, where all subpopulations occur, are all subject to ongoing damage from feral horses, and increasingly dry conditions due to declining rainfall and a consequent increase in severity and intensity of bushfires.

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 1,100 to 2,500 mature individuals, based on sporadic surveys and VBA records.

The number of mature individuals is projected to continue to decline, based on recent declines in subpopulations and ongoing habitat degradation at several localities.

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

Criterion D. Very small or restricted population			
	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: AoO <20 km2 or number of locations ≤5

Evidence:

Ineligible under Criterion D

It is estimated that there are 1,100 to 2,500 mature individuals.

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

References

Backhouse, G., Kosky, B., Rouse, D., and Turner, J. (2016). *Bush Gems: A Guide to the Wild Orchids of Victoria, Australia.* Melbourne, Victoria: EBook.

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014.* Department of Environment and Primary Industries, Melbourne.

Turner, J., Bould, A., and Wilkinson, J. (2014). *Orchids of East Gippsland: A Field Guide.* Bairnsdale: Bairnsdale and District Field Naturalists Club Inc.

VicFlora (2015). Flora of Victoria, Royal Botanic Gardens Victoria: *Pterostylis laxa.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/a7489cd1-7975-4fca-b394-2a895c08a2b7