

## *Pterostylis rubescens* Inland Red-tip Greenhood

### Taxonomy

*Pterostylis rubescens* (D.L. Jones) G.N. Backh.

Basionym: *Specularantha rubescens* D.L.Jones

The taxon is characterised by its uncrowded, plump, rounded flowers that are brownish and scabrous towards the apex and its bluish green rosette leaves. The flowers turn a pinkish or reddish colour on ageing. The taxon is confused with *Pterostylis falcata*, but that species frequents different habitats, has larger flowers with a horizontal or decurved galea (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+3ce+4ace; B2ab(i,ii,iii,iv,v)

### Species Information

#### Description and Life History

The taxon is a flowering plant to 20 cm tall, stem smooth. Rosette leaves 3-5, ovate-lanceolate to elliptic, 2-6 cm long 0.8-1.5 cm wide, scattered on the basal part of the stem, sessile, margins entire. Flower 3-4.5 cm long, erect or semi-nodding, dark green and white; galea apex more or less flat to semi-erect; dorsal sepal acuminate, slightly longer than the petals; lateral sepals erect, loosely embracing the galea leaving a lateral gap, sinus deeply v-shaped when viewed from the front, protruding in a shallow curve when viewed from the side, free points linear-tapered, 2-3 cm long, erect or recurved; petals narrow, subacute. Labellum narrowly ovate-lanceolate, 15-25 mm long, 3-3.5 mm wide, brown, curved forwards in the distal half, subacute to obtuse, distal third protruding from the sinus in the set position. The taxon flowers from November to February (VicFlora 2018).

The taxon flowers from February to July. In this group of *Pterostylis*, non-flowering plants have a rosette of leaves. Flowering plants lack a stem-encircling basal rosette but may have a rosette borne on a short side shoot from the base of the flower stem, which develops as flowering finishes. The flower stem bears multiple very small green and white striped flowers, with some species having brownish tonings on the galea and lateral sepals. The lateral sepals are joined in the basal part and are erect, with short free points closely embracing the galea. The labellum is enclosed within the flower and is usually not visible or the tip may just be visible. Reproduction in this group is thought to be entirely by seed. It relies on good autumn rainfall to flower, flowering sporadically in dry years (Backhouse *et al.* 2016).

#### Generation Length

The generation length of *Pterostylis rubescens* 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

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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 widespread and common across much of inland, northern Victoria on slopes and ridges. The taxon also occurs in New South Wales and the Australian Capital Territory (VicFlora 2018).

### Habitat

While the taxon grows in a wide variety of habitats, it is especially common in dry woodland and open forest on light sandy to heavier well-drained clay loam, often gravelly, soils (Backhouse *et al.* 2016; VicFlora 2018).

### Threats

Although the taxon is well-conserved in several National Parks and in good numbers, the taxon has undoubtedly suffered significant historic decline through habitat loss to agriculture and habitat degradation through a wide range of ongoing threatening processes. Past, current, and future threats include herbivory by a wide range of exotic organisms such as slugs, snails, Red-legged Earth Mites, rabbits, goats, domestic stock (i.e., horses, sheep, cattle) and, potentially, feral deer. The taxon is also threatened by continuing incremental habitat loss and degradation through agricultural intensification, roadside management, and fire management activities. The taxon is threatened in all habitats by incremental weed invasion and increased competition. The taxon is at increasing risk of climatic drying and warming, and increasing frequency and intensity of fire, including planned burning, bushfire, and back-burning. The taxon is further threatened by soil compaction, surface erosion, leaf litter loss, destruction of cryptogamic crusts and moss beds, and by a decline in mycorrhizal fungal activity.

### 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 style="text-align: center;">based on any of the following:</p> <ul style="list-style-type: none"> <li>(a) direct observation [except A3]</li> <li>(b) an index of abundance appropriate to the taxon</li> <li>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</li> <li>(d) actual or potential levels of exploitation</li> <li>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</li> </ul>			

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## Evidence:

### Eligible under Criterion A2 as Endangered

The population reduction over the past 60 to 120 years is suspected to be 35 to 70% (midpoint 50%), based on (a), (c) and (e) above.

Past decline is based on the impact of the identified threats.

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

### Eligible under Criterion A3 as Endangered

The population reduction over the next 60 to 100 years is suspected to be 50 to 80% (midpoint 65%), based on (c) and (e) above.

Future decline is based on the impact of the identified threats.

### 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 estimated to be 50 to 80% (midpoint 65%), based on (a), (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

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 <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
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 80 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented naturally at the regional scale and both naturally and anthropogenically at the landscape scale, with geographically isolated occurrences situated at separations typically exceeding the dispersal range of the taxon which is wind-dispersed at the kilometre scale

It is estimated to have 3 locations. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the current and projected impact of the identified threats.

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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:

#### Ineligible under Criterion C

It is estimated that there are 100,000 to 200,000 mature individuals, which exceeds the thresholds for criterion C.

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: AoO < 20 km <sup>2</sup> or number of locations ≤ 5

### Evidence:

#### Eligible under criterion D2 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

Backhouse, G. N. (2010). New combinations in the terrestrial orchid genera *Caladenia* R.Br., *Corybas* Salisb. and *Pterostylis* R.Br. (Orchidaceae) for south-eastern Australia. *The Victorian Naturalist*, 127(2), 57.

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