

## *Pterostylis* sp. aff. *plumosa* (Anglesea) Large Plume-orchid

### Taxonomy

*Pterostylis* sp. aff. *plumosa* (Anglesea) sensu Bishop (1996)

This has been formally described as *Plumatichilos unicornis* D.L.Jones, (Jones 2018) but to date no combination has been made for it under *Pterostylis* (VicFlora 2019). The taxon is similar to *Pterostylis plumosa*, but generally more robust with slightly larger flowers and a green knob on the labellum apex.

### Current conservation status

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

### Proposed conservation status

Critically Endangered in Victoria

Criterion B1ab(i,ii,iii,v)

### Species Information

#### Description and Life History

The taxon is a flowering plant to 35 cm tall, stem leaves 2-4, closely sheathing. Rosette leaves 5-20, elliptic, 1-4.5 cm long, 4-12 mm wide, petiolate, margins entire. Flower 35-40 mm long, erect, translucent with dark green lines and reticulations, often shiny; galea erect in the basal two-thirds then curved forwards; dorsal sepal with an upturned filiform point 4-6 mm long; lateral sepals deflexed, conjoined part narrow, margins incurved, with a prominent thickened green pad, free points linear, 13-16 mm long, parallel or slightly divergent. Labellum 15-25 mm long, broadest near the base (c. 1.5 mm across), tapered to a linear-filiform central section and with a green apical knob c. 4.5 mm long and c. 3 mm wide, all margins, except those of the knob, bearing moderately dense bright yellow hairs 3-6 mm long, the distal two-thirds protruding from the sinus in the set position. The taxon flowers from September to October (VicFlora, 2019).

The taxon is easily recognised by its relatively large flowers with a long point to the galea, long free points to the lateral sepals and the green apical knob on the labellum (Backhouse et al., 2016).

#### Generation Length

The generation length of *Pterostylis* sp. aff. *plumosa* (Anglesea) is estimated to be 30 to 50 years. Long-term observation and monitoring of populations of terrestrial orchids in general suggests very low recruitment over decades, and individual plants may be very long-lived, possibly several decades.

#### Distribution

The taxon is endemic to Victoria, where it appears to be confined to the eastern Otway Ranges near the coast, but the exact distribution is uncertain due to confusion with similar taxa, probably in part because it continues to be misidentified as *P. plumosa*. The altitude ranges from 10-120 metres ASL.

#### Habitat

The taxon grows in coastal heath and heathy woodland on well-drained sandy to light clay loam soils (Backhouse et al., 2016; VicFlora, 2019).

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## Threats

There is evidence of previous decline in distribution and abundance from loss of subpopulations and habitat through clearing, weed invasion, and disturbance. Subpopulations and habitat have been lost in recent decades due to expanding residential development around Anglesea. Most remaining subpopulations occur on public land and there is little indication of any current decline. However, subpopulations and habitat are considered at risk from disturbance (especially from trail bike riders), weed invasion and increasingly dry conditions from declining rainfall and a consequent increase in the severity and intensity of bushfires. One subpopulation may be affected by a proposed road realignment. 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> <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>			

## Evidence:

### Eligible under Criterion A2 as Endangered

The population reduction over the past 90 to 150 years is inferred to be 15 to 70% (midpoint 50%), based on (a), (c) and (e) above.

Past decline is based on a known loss of subpopulations and habitat.

### Eligible under Criterion A4 as Endangered

The population reduction over any 90 to 150 year period, including both past and future (up to 100 years in the future), is inferred to be 30 to 70% (midpoint 50%), based on (a), (c) and (e) above.

Future decline is based on ongoing disturbance and possible habitat loss in response to the effects of the identified threats.

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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 B1 as Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 42 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas.

It is estimated to have 1 location. All subpopulations occur in a small area around Anglesea and Aireys Inlet, which is deemed as a single location. All key identified threats apply across the range of the taxon, and can rapidly affect all individuals of the taxon present.

It has a continuing decline in (i), (ii), (iii) and (v) above.

### Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 28 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has 1 location and has a continuing decline in (i), (ii), (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 290 to 600 mature individuals. The taxon is known from fewer than 600 plants, based on sporadic surveys and VBA records.

The number of mature individuals is projected to continue to decline, and the 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: AoO < 20 km <sup>2</sup> or number of locations ≤ 5

## Evidence:

### Eligible under criterion D as Vulnerable

It is estimated that there are 290 to 600 individuals, and 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.



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## References

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- Jones, D. L. (2018). Six new species of Plumatictilos (Orchidaceae: Pterostylidinae) from South-eastern Australia and a new species from New Zealand. *Australian Orchid Review*, 83(4), 26-44.
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