

## *Hybanthus vernonii* subsp. *vernonii* Erect Violet

### Taxonomy

*Hybanthus vernonii* subsp. *vernonii* (F. Muell.) F. Muell.

Subsp. *scaber* from New South Wales has scabrous stems and leaves, and all leaves lanceolate, obovate or sometimes tricuspidate (VicFlora 2019).

### Current conservation status

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

### Proposed conservation status

Vulnerable in Victoria

Criteria B1ab(iii)+2ab(iii)

### Species Information

#### Description and Life History

The taxon is a herb, to 1 m tall, glabrous. Leaves mostly lanceolate, the upper ones usually linear, 0.5-4.5 cm long; stipules linear, c. 0.5 mm long. Flowers solitary, axillary. Sepals lanceolate, 1.5-5 mm long, green; petals blue-mauve, lower petal ovate, 9-16 mm long, upper pair broadly oblong, lateral petals narrowly oblong. Capsule 6-8 cm long; seeds globose, c. 2.5 mm diam., smooth, with a prominent pale caruncle c. 1 mm long. The taxon flowers from June to October (VicFlora 2019).

#### Generation Length

The generation length of *Hybanthus vernonii* subsp. *vernonii* is estimated to be 20 to 30 years. This is based on a plausible longevity of 30 years, a pre-settlement fire interval in the 40-80 year range and the likelihood that recruitment occurs more or less continually due to small scale disturbances, but with episodic fire-induced mass recruitment also occurring.

#### Distribution

The taxon is found in coastal areas east of Marlo, extending into New South Wales up the east coast to near the border with Queensland (VicFlora 2019).

This taxon appears to be naturally restricted within Victoria and only occurs more broadly on the east coast of Australia.

#### Habitat

The taxon occurs on near-coastal heaths and damp depressions (VicFlora 2019).

#### Threats

In the long-term, the taxon is threatened by climatic drying and warming resulting in changes in vegetation structure, such as increasing shrub density, and potential changes in soil moisture and microflora, particularly where it affects mycorrhizal fungi.

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As of early January 2020, the bushfires of 2019/2020 are believed to have affected around 64% of the taxon's modelled habitat, with a further 95% of modelled habitat projected to be damaged. The overall impacts of the fire are yet to be determined.

The taxon is likely to be threatened by feral herbivores, notably Sambar Deer (*Rusa unicolor*), as well as any soil or vegetation disturbance within its habitat during fire recovery activities (e.g., machinery used to clear hazards). Drought, hot weather, and repeat fires have the potential to damage or destroy recovering plants and/or seedlings.

The taxon's short-term, post-fire recovery depends on the effective control of the effects of herbivores and on preventing soil and vegetation disturbance of its habitat during fire recovery activities.

### 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>			

### Evidence:

#### Ineligible under Criterion A

The past population reduction does not meet the threshold for eligibility under Criterion A2. There is insufficient evidence to determine whether will be a future reduction in population size (Criterion A3).

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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 Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 2,073 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

It is inferred to have up to six locations, as the identified threats short-term threats (feral herbivores, soil or vegetation disturbance, repeat fires) are likely to operate at different intensities and timing throughout the taxon's range.

It has a continuing decline in (iii) above as a result of climatic warming, which may result in reduction of moisture in its specific habitat, and may possibly lead to shrub encroachment.

### Eligible under Criterion B2 as Vulnerable

The Area of Occupancy (AoO) across the taxon's range is estimated to be 110 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon has up to six locations, and has a continuing decline in (iii) 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:

#### Ineligible under Criterion C

It is estimated that there are 5,000 to 10,000 mature individuals, but other thresholds under this criterion have not been met.

The current population estimate is based on distribution and recorded plant densities. Plants are generally recorded as scattered, but over a very large area, therefore it is estimated that, on average, each 4 km<sup>2</sup> grid contains between 200-400 mature individuals.

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:

#### Ineligible under Criterion D

It is estimated that there are 5,000 to 10,000 mature individuals, which exceeds the threshold for Criterion D.

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



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## References

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

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Hybanthus vernonii* subsp. *vernonii*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/6e80265d-baba-451f-8dd3-4c1ed0394401>