

## *Thelymitra benthamiana* Blotched Sun-orchid

### Taxonomy

*Thelymitra benthamiana* Rchb. f.

Reichenbach, H.G. (1871), Beitrage zur Systematischen Pflanzenkunde: 55

### Current conservation status

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

### Proposed conservation status

Endangered in Victoria

Criterion B2ab(iii,v)

### Species Information

#### Description and Life History

Flowering stem erect, straight, 10-55 cm tall, 1.5-5 mm diam., green. Leaf ovate-lanceolate to ovate, 5-25 cm long, 8-55 mm wide, erect or obliquely erect, base contracted, sheathing for up to half its length, blade flattish, leathery, ribbed abaxially, bright green to yellow-green. Inflorescence (1-)3-5(-15)-flowered. Sterile bracts usually 2, sometimes 3. Perianth segments thick-textured, lanceolate to ovate-lanceolate, 10-20 mm long, yellow or yellow-green with dark brown or red-brown spots or blotches. Column erect, 6-10 mm long, green or yellowish with red-brown spots, very broadly winged, the wings deeply fringed along distal margin; mid-lobe short, dorsal surface covered densely with orange hairs; supra-anther lobe 1.7-2.5 mm long, rod-like with a swollen clavate apex, decurrent on mid-lobe; lateral lobes digitiform 1-2 mm long, yellow, each with 2 similar but slightly thinner and longer basal lobes. Anther inserted towards base of column, apex produced into a fleshy, curved beak 2.5-3.5 mm long. The taxon flowers most prolifically following hot summer fires or other habitat disturbance (VicFlora 2019).

The taxon flowers from October to December. The populations usually consist mostly of non-flowering plants, especially in dense heathy habitat, with summer fires enhancing flowering in the following spring. Some plants growing in more open areas will usually flower each year. The flowers will partially open in cooler weather but open widely on only the warmest, humid days (Backhouse *et al.* 2016).

#### Generation Length

The generation length of *Thelymitra benthamiana* 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, every 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 (OSRs) reliant on seed-based recruitment for population maintenance.

#### Distribution

The taxon is sparsely distributed across southern and western Victoria, west from Wilsons Promontory to the South Australian border. The altitude ranges from 10-350 metres above sea level. The taxon also occurs in Western Australia, South Australia, and Tasmania (Backhouse *et al.* 2016).

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## Habitat

The taxon is uncommon in gravelly and heavier clay-soils, mostly in light forest. It is found mostly in heathland, heathy woodlands and open forests on well-drained sand and clay loams (Backhouse *et al.* 2016; VicFlora 2014).

## Threats

The taxon's habitat has probably undergone considerable decline due to land clearing since 1900. Currently, it is relatively well-conserved in reserves. However, fire suppression could potentially be detrimental to the long-term survival of a population by stopping flowering and, thus, recruitment.

## 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:

### Ineligible under Criterion A

The past population reduction does not meet the threshold for eligibility under criterion A2, and the future population reduction does not meet the threshold for eligibility under 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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 274 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 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.

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

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 <u>C1</u> or <u>C2</u>				
<u>C1</u>	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)	
<u>C2</u>	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			

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## Evidence:

### Ineligible under Criterion C

It is estimated that there are 8,000 to 16,000 mature individuals, but other thresholds under this criterion have not been met.

Criterion D - Very small or restricted population <sup>Ⓜ</sup>			
<sup>Ⓜ</sup>	Critically Endangered <sup>Ⓜ</sup>	Endangered <sup>Ⓜ</sup>	Vulnerable <sup>Ⓜ</sup>
Number of mature individuals (observed or estimated) <sup>Ⓜ</sup>	<50 <sup>Ⓜ</sup>	<250 <sup>Ⓜ</sup>	<1,000 <sup>Ⓜ</sup>
D2 - Only applies to the VU category <sup>¶</sup> 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. <sup>Ⓜ</sup>	- <sup>Ⓜ</sup>	- <sup>Ⓜ</sup>	D2 - Typically: <sup>¶</sup> AoO < 20 km <sup>2</sup> or number of locations ≤ 5 <sup>Ⓜ</sup>

## Evidence:

### Ineligible under Criterion D

It is estimated that there are 8,000 to 16,000 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.

VicFlora (2014). Flora of Victoria, Royal Botanic Gardens Victoria: *Thelymitra benthamiana*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/edf61618-2aec-4c5d-ae3a-34023b4364c5>