



Thelymitra simulata Graceful Sun-orchid

Taxonomy

Thelymitra simulata D.L. Jones & M.A. Clem.

Suggestions that this taxon may be a hybrid are not borne out by recent field studies in the Snowy Mountains of New South Wales and in Tasmania (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; B2ab(ii,iii,iv,v)

Species Information

Description and Life History

The taxon has a flowering stem erect, straight, 15-35 cm tall, 2-3 mm diam., brownish, pruinose. Leaf linear-lanceolate, 10-15 cm long, 4-8 mm wide, fleshy, canaliculate, ribbed abaxially, dark green, often reddish at base. Inflorescence 1-6-flowered, loose. Sterile bracts 2 or 3. Perianth segments ovate to ovate-lanceolate, 9-13 mm long, blue or pink, with small darker spots on dorsal sepal and petals. Column 6-7 mm long, bluish or white, often with a dark brown or purplish subterminal band; mid-lobe tubular, rim-like, the dorsal surface ruminant, apex shallowly crenate, yellow; accessory-lobes absent; lateral lobes 0.8-1.5 mm long, obliquely erect, ending in a mop-like white hair-tuft. Anther about half way along column, shortly beaked (VicFlora, 2018).

The taxon flowers from November to January. The taxon is not often seen in peak flower, as even on the warmest, most humid days of summer the plants seem reluctant to flower, only opening about mid-morning and closing by mid-afternoon (Backhouse et al., 2016).

Generation Length

The generation length of *Thelymitra simulata* 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 (OSRs) reliant on seed-based recruitment for population maintenance. Visible ramets essentially represent distinct genets, since a single leaf emerges each year from an annually replaced tuberoid (although very occasionally), usually in response to minor subterranean injury. Two daughter tuberoids are produced instead of the normal one tuberoid, resulting in two ramets in very close proximity. However, it is to monitor numbers since seedlings may also occur in very close proximity.

Distribution

The taxon occurs in the mountains of eastern and north-eastern Victoria, as far west as Mt Baw Baw. The altitude ranges from 700-1,500 metres ASL. It also occurs in Tasmania, ACT, and NSW (Backhouse et al., 2016).

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Habitat

The taxon is found in montane, alpine meadows, and open forests dominated by Snow Gums (*Eucalyptus pauciflora*) and in subalpine herbfield and grassland. Soils are stony loam and well-structured brown loam (Backhouse et al., 2016; VicFlora, 2018).

Threats

The taxon is likely to have suffered declines across its range from the impacts of feral herbivores, and because its habitat coincides with the favoured grazing areas of cattle and horses, impacts are continuing. Although alpine cattle grazing has mostly ceased, Cobungra State Forest is still subject to a grazing licence. Elsewhere, impacts of horses and deer are continuing, with considerable impacts to alpine habitat from grazing, pugging, trampling and soil compaction. The Cobberas area is particularly prone to impacts of feral horses, since they are not controlled in NSW and constantly move into Victoria.

In addition, the bushfires of 2019/2020 are believed to have impacted around 15% of the taxon's modelled habitat. The overall impacts of the fire are yet to be determined, but any regrowth is likely to be threatened by feral herbivores. Drought, hot weather and repeat fires have the potential to damage or destroy recovering plants and/or seedlings.

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"> (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 Endangered

The population reduction over the past 60 to 120 years is inferred to be 50%, based on (a), (c) and (e) above. This is based on the impacts of feral herbivores, which would have occurred across the taxon's range.

The causes of the 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 ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 50 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

Based on DELWP records 2018 and observations.

The taxon is inferred to be severely fragmented, and is inferred to have a continuing decline in (ii), (iii), (iv) and (v) above.

The taxon is scattered and widespread throughout the alpine region (Backhouse et al., 2016) but it is limited to islands of habitat in montane and sub-alpine environments .

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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 10,000 to 20,000 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 ² or number of locations ≤ 5

Evidence:

Ineligible under Criterion D

It is estimated that there are 10,000 to 20,000 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.

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