

Thelymitra pallidiflora Pallid Sun-orchid

Taxonomy

Thelymitra pallidiflora Jeanes

Current conservation status

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

Proposed conservation status

Critically Endangered in Australia

Criteria A2ace+4ace; C2a(i); D

Species Information

Description and Life History

The taxon is a flowering stem erect, straight, 15-45 cm tall, 1.3-3 mm diam., straw-coloured to purplish. Leaf linear to linear-lanceolate, attenuate, 10-25 cm long, 5-12 mm wide, thin-textured to fleshy, canaliculate, ribbed abaxially, sheathing at base, pale to dark green sometimes with a purplish base. Inflorescence 2-10-flowered, open. Sterile bracts usually 1, rarely 2. Pedicels of lower flowers often partially decurrent on rachis. Perianth segments lanceolate to ovate, 9-15(-21) mm long, white to very pale blue. Column 5-6.5 mm long, white or very pale blue at base; mid-lobe expanded into a hood over the anther, tubular, inflated, curving gently through c. 90 deg. yellow with a black to dark brown collar, apex usually deeply bilobed; lateral lobes converging, 1-1.7 mm long, digitiform, porrect at base then curved upwards, each with a toothbrush-like arrangement of white hairs terminating in front of the mid-lobe. Anther inserted about mid-way along column, shortly beaked. The taxon flower from October to November. The flowers are self-pollinating and only open on warm, humid days (VicFlora 2014).

Generation Length

The generation length of *Thelymitra pallidiflora* is estimated to be 20 to 40 years (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 reliant on seed-based recruitment for population maintenance.

Distribution

The taxon is endemic to southern Victoria, where it is known only from near Anglesea and Crib Point (Jeanes, 2004). The altitude ranges from 5-100 metres above sea level. It appears to be a very rare orchid that is currently known from just two regions and few populations with low numbers of plants. However, it is probably overlooked and mistaken for other taxa in the *T. pauciflora* complex and may be more common than current records suggest.

Habitat

The taxon grows in heathy and grassy woodlands on sandy loams (Jeanes, 2004; Backhouse et al., 2016).

Threats

The taxon was once almost certainly more widespread and abundant but has suffered a decline due to extensive loss of habitat, mostly for residential development. The subpopulation at Crib Point survives in a tiny habitat remnant surrounded by residential development and has suffered past extensive loss due to urban development.

Historical loss of habitat and ongoing disturbance at the Anglesea sites suggests there may have been some declines. The two largest subpopulations occur in reserves near Anglesea, although they are still at risk from disturbance, especially from illegal trail bike activity, and possible habitat changes from drying conditions due to reducing rainfall. The very small subpopulation occurring at Crib Point is at risk from habitat changes and stochastic events.

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;"><i>based on any of the following:</i></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 Critically Endangered

The population reduction over the past 60 to 120 years is suspected to be 50 to 90%, based on (a), (c) and (e) above.

Past decline is based on the extensive loss of habitat at Crib Point for urban development and the historical loss of habitat and ongoing disturbance at the Anglesea site.

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

Eligible under Criterion A4 as Critically Endangered

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The population reduction over any 60 to 120 year period, including both past and future (up to 100 years in the future), is inferred to be 10 to 90%, based on (a), (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

The remaining very small subpopulation at Crib Point is highly vulnerable to habitat changes from decreasing rainfall and stochastic events, leading to population reductions. In addition, ongoing disturbance and possible habitat changes from drying due to reducing rainfall at the Anglesea subpopulations suggest there may be ongoing declines there.

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 B as Endangered

The Extent of Occurrence (EoO) is estimated to be 245 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The Area of Occupancy (AoO) is estimated to be 12 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

The taxon is estimated to be severely fragmented, has 2 locations, and has a continuing decline in (i), (ii), (iii), (iv) 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 Critically Endangered

It is estimated that there are 40 to 100 mature individuals, based on herbarium and VBA records, sporadic survey, and monitoring.

The number of mature individuals is inferred to continue to decline, the number of mature individuals in each subpopulation is 50 or fewer.

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: AaO: < 20 km ² or number of locations ≤ 5

Evidence:

Eligible under Criterion D as Endangered

The taxon is estimated to have 40 to 100 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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Jeanes, J.A. (2004). A revision of the *Thelymitra pauciflora* R.Br. (Orchidaceae) complex in Australia. *Muelleria*, 19, 19-79.

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