



Thelymitra reflexa Gaping Sun-orchid

Taxonomy

Thelymitra reflexa Jeanes

This is a recently described, poorly known species (Backhouse et al., 2016).

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+3ce+4ace; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C1; D

Species Information

Description and Life History

The taxon has an erect flowering stem, straight, 17-45 cm tall, 0.7-2 mm diam., purplish. Leaf linear to linear-lanceolate, attenuate, 10-25 cm long, 3-10 mm wide, fleshy, canaliculate, ribbed abaxially, sheathing at base, dark green with a purplish base. Inflorescence 2-6-flowered, open. Sterile bracts usually 2, occasionally 3. Perianth segments lanceolate to ovate, 5-10 mm long, purplish blue, reflexing strongly on hot days. Column 4-5.5 mm long, pink or purplish at base; mid-lobe expanded into a hood over the anther, tubular, not inflated, often somewhat compressed dorsally, curving forward gently through c. 90 deg., dark blackish green to brown throughout, apex usually deeply bilobed; lateral lobes converging or more or less parallel, 1-1.4 mm long, digitiform, porrect at base then curving gently upwards, each with a sub-terminal mop-like tuft of white (rarely pink) hairs embracing the apex of the mid-lobe. Anther inserted above centre of column, shortly beaked (VicFlora, 2014).

The taxon flowers from mid-October to late November. Flowers open fairly readily in even mild weather, unlike most species in the *T. pauciflora* complex that open only in much warmer more humid conditions. On hot days (usually in excess of 30 degrees), the flowers open very widely., with the sepals and petals often folded backwards and even recurved against the ovary, although even then on some plants the flowers remain cupped (Backhouse et al., 2016).

This taxon is facultatively autogamous. It grows sympatrically with many other *Thelymitra* and has been observed flowering synchronously with at least 12 other taxa. On hot days, it is the only taxon in the area to display the characteristic reflexed tepals, and this feature is consistent throughout the population. The only other *Thelymitra* sp. observed by G. Backhouse to have comparably reflexed tepals is the unrelated and allopatric *Thelymitra luteociliium*, but this feature is rare for *T. luteociliium* and is not consistent throughout a population at any given time (Jeanes, 2005).

Generation Length

The generation length of *Thelymitra reflexa* is suspected 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

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decades only. Such orchids are classed as obligate seed regenerators (OSRs) reliant on seed-based recruitment for population maintenance.

Distribution

The taxon is endemic to southern Victoria, where it has been recorded only from the Crib Point area of the Mornington Peninsula, nearby Stony Point, and French Island in Western Port. It occurs at an altitude of 20 metres above sea level. It appears to be a rare orchid that is restricted to the Western Port region of Victoria. However, it is almost certainly overlooked and mistaken for *T. pauciflora* or other similar species, and is possibly more widespread than current records suggest (Backhouse et al., 2016; Jeanes, 2005).

Habitat

The taxon grows in near-coastal heathy and grassy woodland on seasonally damp sandy to clay loam soils (Backhouse et al., 2016; Jeanes, 2005).

Threats

The taxon was almost certainly more widespread and abundant but there has been extensive loss and degradation of habitat in the Crib Point and Stony Point areas, and the taxon now survives in tiny habitat remnants, which are at high risk. Both subpopulations face multiple threats including disturbance, weed invasion and drying conditions from decreasing rainfall. Very small subpopulations are at high risk of rapid decline or extinction from 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;">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>			

Evidence:

Eligible under Criterion A2 as Critically Endangered

The population reduction over the past 60 to 120 years is inferred to be 90 to 99%, based on (a), (c) and (e) above.

Past decline is based on observed declines in the remaining subpopulations and extensive loss and degradation of habitat in the Crib Point and Stony Point areas.

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

Eligible under Criterion A3 as Critically Endangered

The population reduction over the next 60 to 100 years is projected to be 65 to 99%, based on (c) and (e) above.

Future decline is based on multiple threats (including disturbance, weed invasion and drying conditions from decreasing rainfall) operating on the two remaining subpopulations at Crib Point and Stony Point.

Eligible under Criterion A4 as Critically Endangered

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 65 to 99%, based on (a), (c) and (e) above. The causes of 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 B1 as Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 8 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The EoO has been made equal to the AoO to ensure consistency with the definition of AoO as an area within EoO.

The taxon is estimated to be severely fragmented, considering its dispersal ability, the barriers or lack of habitat separating them.

It is estimated to have 1 location and has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on multiple threats including disturbance, weed invasion and drying conditions from decreasing rainfall.

Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 8 km², 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), (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 C1 as Critically Endangered

It is estimated that there are 35 to 100 mature individuals, based on VBA records, sporadic surveys and monitoring. There is an estimated continuing decline of 20 to 50% within one generation.

Eligible under Criterion C2 as Endangered

The number of mature individuals is inferred to continue to decline, the number of mature individuals in each subpopulation is 250 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: AoO < 20 km ² or number of locations ≤ 5

Evidence:

Eligible under Criterion D as Critically Endangered

The taxon is estimated to have 35 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.

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne. Retrieved from:
https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf

Jeanes, J. A. (2005). *Thelymitra reflexa* (Orchidaceae) a new rare species from Victoria, Australia. *Muelleria*, 21, 87-90.

VicFlora (2014). Flora of Victoria, Royal Botanic Gardens Victoria: *Thelymitra reflexa*. Retrieved from:
<https://vicflora.rbg.vic.gov.au/flora/taxon/f34e879a-9aec-425a-a4ce-79a4386b52f8>