Threatened Species Assessment

Thelymitra basaltica
Grassland Sun-orchid

Taxonomy

Thelymitra basaltica Jeanes

This taxon was only recently named and described. It is a member of the *Thelymitra pauciflora* complex (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

ySpecies Information

Description and Life History

The taxon has an erect flowering stem, straight, 10-30 cm tall, 1.5-3.3 mm diam., green to purplish, usually shorter than leaf. Leaf linear to linear-lanceolate, attenuate, 12-30 cm long, 5-15 mm wide, very fleshy, canaliculate, ribbed abaxially, sheathing at base, dark green with a purplish base. Inflorescence 2-8-flowered, open. Sterile bracts 1, rarely 2. Perianth segments lanceolate to ovate, 6-11 mm long, pale blue to pale purplish blue. Column slender, 4-6.5 mm long, pale blue; mid-lobe expanded into hood over the anther, tubular, slightly inflated, curved gently forward, yellow with a reddish brown collar, apex entire to shallowly bilobed; lateral lobes converging 0.8-1.3 mm long, digitiform, porrect at base then bent upwards sharply near the middle at c. 90 deg., each with a toothbrush-like arrangement of white hairs embracing the apex of the mid-lobe. Anther inserted about mid-way along column, shortly beaked. The taxon flowers late September to early November. The taxon is distinguished by the large fleshy leaf that is usually as long as the entire inflorescence. The taxon often grows in tight clumps apparently from vegetative reproduction (VicFlora 2014). It is facultatively autogamous and sometimes also cleistogamous.

The taxon appears to be a rare orchid that is known from a few small, widely separated populations. However, it almost certainly occurs elsewhere within its range, but is still overlooked and mistaken for *T. pauciflora*. Plants often grow in small, tight clumps, most likely from vegetative reproduction (Backhouse *et al*. 2016).

Generation Length

The generation length of *Thelymitra basaltica* 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 decades only. Such orchids are classed as obligate seed regenerators (OSRs) reliant on seed-based recruitment for population maintenance.

Distribution

In Victoria, the taxon occurs 10.5 km west of Rokewood towards Skipton. The taxon is currently known with certainty only from approximately 10.5 km west of Rokewood towards Skipton in the Victorian Volcanic Plains bioregion. It is known only from a few roadside remnants (Jeanes 2004; VicFlora 2014).

Habitat

The taxon grows in herb-rich native grassland, often with embedded basalt rocks, on sandy brown to heavy black basalt, volcanic clay loam soils. The altitude ranges from 120-200 metres above sea level (Backhouse *et al.* 2016; Jeanes 2004; VicFlora 2014).

Threats

The taxon was probably much more common in the south-west, but virtually all of its habitat has been lost to agriculture, and it now exists in small, isolated populations on roadsides and in a few tiny reserves (Backhouse *et al*. 2016).

Only tiny habitat remnants remain, all of which are at risk from disturbance and weed invasion. There is a high likelihood of ongoing decline in distribution and abundance due to disturbance (specifically the roadside subpopulations), heavy weed invasion and the loss of shallow freshwater marshes from increasingly dry conditions due to declining rainfall.

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%

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

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.

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*]

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.

based on any of the following:

(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 inferred to be 80 to 99%, based on (a), (c) and (e) above.

Past decline is based on widespread degradation and the historical loss of shallow freshwater marshes across the range of the taxon.

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 30 to 80%, based on (c) and (e) above.

There is a high likelihood of ongoing decline in distribution and abundance due to disturbance (specifically the roadside subpopulations) and heavy weed invasion. All remaining habitat, particularly shallow freshwater marshes, is at high risk of loss and long-term decline from increasingly dry conditions due to declining rainfall.

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 80 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 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²
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 305 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The Area of Occupancy (AoO) is estimated to be 28 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 1 location, and has a continuing decline in (v) above.

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 Endangered

It is estimated that there are 1,650 to 6,600 mature individuals based on sporadic surveys and VBA records.

There is an estimated continuing decline of 30 to 50% within two generations.

Criterion D. Very small or restricted population			
	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 km2 or number of locations ≤ 5

Evidence:

Eligible under criterion D as Vulnerable

The taxon is estimated to be very restricted.

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. (2004). A revision of the *Thelymitra pauciflora* R.Br. (Orchidaceae) complex in Australia. *Muelleria, 19*, 19-79.

VicFlora (2014). Flora of Victoria, Royal Botanic Gardens Victoria: *Thelymitra basaltica*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/dda156ce-7e9a-4fbe-9922-91366d64cdde

VicFlora (2019a). Flora of Victoria, Royal Botanic Gardens Victoria: *Tasmannia xerophila*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/1535240e-4d89-43d8-90b6-7e02fcf7f6db

VicFlora (2019b). Flora of Victoria, Royal Botanic Gardens Victoria: *Tasmannia vickeriana*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/22379aad-a065-4bd4-ba22-127dd4c8777f