Threatened Species Assessment

Thelymitra longiloba
Marsh Sun-orchid

Taxonomy

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

Thelymitra longiloba has been confused with *T. media,* but can be distinguished by its generally earlier flowering season, less robust nature, smaller flowers and longer, narrower auxiliary lobes on the column (VicFlora, 2018).

It was only recently given species status, previously being known as *T. media* var *carneo-lutea*, that was named from a pink and yellow-flowered plant from Tynong North (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 Victoria

Criterion C1+2a(i)

Species Information

Description and Life History

The taxon is a flowering stem erect, slender, straight, 15-55 cm long, 1-3.5 mm diam., green to purplish. Leaf linear to linear-lanceolate, attenuate, 10-28 cm long, 4-10 mm wide, fleshy, canaliculate, ribbed abaxially, sheathing at base, dark green with a purplish base. Inflorescence 1-8-flowered. Sterile bracts usually 2, rarely 1 or 3. Flowers pale blue to dark blue, sometimes pink; perianth segments ovate to lanceolate, 6-13 mm long. Column cylindric to quadrangular, 3-5 mm long, pinkish or pale blue; mid-lobe barely hooding, 0.5-1 mm long, c. 1 mm wide, yellow with a black subapical collar, apex with a 1-few rows of rounded calli; auxiliary lobes 0.6-1.5 mm long, converging, more or less rectangular, fleshy, porrect or obliquely erect, apex entire or shallowly toothed, yellow; lateral lobes 1-2 mm long, oblong, porrect or obliquely erect, apical margins with a toothbrush-like arrangement of white hairs. Anther inserted near middle of column, with a slender incurved beak protruding below the lateral lobes. Flowers in October and November. Flowers in open freely in warm to hot weather and are self-pollinating (VicFlora, 2018).

This taxon is rarely seen in flower, as flowers hardly ever open fully, even on hot humid days, and even then are usually closed by midday, compounding the difficulties in identification in the field (Backhouse et al., 2016).

Generation Length

The generation length of *Thelymitra longiloba* 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

The taxon occurs in southern Victoria, east from Port Phillip Bay, with a single record from the north-east at Cravensville. The altitude range is approximately 10-400 metres above sea level. It appears to be a rare orchid that

is known from a few sites and a small number of plants. Although it occurs over a fairly wide distribution it is currently known only from the Westernport region, East Gippsland and from a single record in north-eastern Victoria. Given this distribution across eastern Victoria the paucity of records is odd and is most likely due to the species being overlooked or mistaken for other sun-orchid, especially *T. media* (Backhouse et al., 2016).

Habitat

The taxon grows in seasonally damp coastal and near-coastal swampy heathland and heathy woodland in low-lying moist areas or drier sites on heavy black, sandy clay, and sometimes peaty loam soils (Backhouse et al., 2016; VicFlora, 2018).

Threats

There have been possible losses or declines in 3 subpopulations and widespread habitat loss in the Western Port catchment. A subpopulation at Tynong North has not been seen for some decades, despite sporadic surveys, and it may have been lost. The subpopulation at Cravensville is known only from a herbarium record. There have been no recent searches in the region, and its persistence is unknown, although some potentially suitable habitat remains in the district. The Crib Point subpopulation is very small, has almost certainly declined, and grows in a tenuous situation with disturbance and weed invasion the major threats.

There is the possibility of a future decline in distribution and abundance, based on the possible long-term decline and loss of seasonally damp habitats from increasingly dry conditions due to declining rainfall and attendant increase in frequency and intensity of bushfires. Very small subpopulations are highly susceptible to stochastic events causing major decline or local extinction within a very short time frame.

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 Endangered

The population reduction over the past 60 to 120 years is estimated to be 30 to 95% (midpoint 60%), based on (c) and (e) above.

Past decline is based on the probable loss of one subpopulation, the unknown status of a second, and extensive loss of habitat in the Western Port catchment.

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

Eligible under Criterion A3 as Endangered

The population reduction over the next 60 to 100 years is projected to be 30 to 90% (midpoint 60%), based on (c) and (e) above.

Future decline is based on the likely long-term decline and loss of seasonally damp habitat from increasingly dry conditions due to declining rainfall and possibly attendant increase in the frequency and intensity of bushfires.

Eligible under Criterion A4 as Endangered

The population reduction over any 60 to 120 year period, including both past and future (up to 100 years in the future), is estimated to be 30 to 95% (midpoint 60%), 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 Area of Occupancy (AoO) is estimated to be 40 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

Any two of (a), (b) or (c) above are also satisfied.

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 C as Critically Endangered

It is estimated that there are 70 to 400 mature individuals, based on sporadic surveys and VBA records. This taxon was only recently named and described, and is known from just 10 small subpopulations.

There is an estimated continuing decline of 10 to 30% within one generation.

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

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 Endangered

It is estimated that there are 70 to 400 mature individuals.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

References

Backhouse, G. and Cameron, D. (2005). Application of IUCN 2001 Red List Categories in Determining the Conservation Status of Native Orchids of Victoria, Australia. *Selbyana* 26(1,2): 58-74.

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.

Jones, D. L., and Clements, M. A. (1998). A taxonomic review of *Thelymitra* in Tasmania. *Australian Orchid Research, 3*, 191-192.

Turner, J., Bould, A., and Wilkinson, J. (2014). *Orchids of East Gippsland: A Field Guide.* Bairnsdale: Bairnsdale and District Field Naturalists Club Inc.

VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Thelymitra longiloba.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/0402f919-bcda-475a-a0a7-00e9503bff09