Threatened Species Assessment

Thomasia petalocalyx
Paper Flower

Taxonomy

Thomasia petalocalyx F. Muell.

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 A2bce; B2ab(i,ii,iii,v)

Species Information

Description and Life History

Shrub 0.3-1 m high. Leaves ovate to lanceolate or more-or-less oblong, 1-4 cm long, 0.5-1.3 cm wide, both surfaces with stellate hairs; petioles to c. 5 mm long; stipules leaf-like, sessile, 8-12 mm long, 4-8 mm wide. Inflorescence 1-5-flowered; bracteoles 3, 5-6 mm long, 2.5-3 mm wide, greenish, conspicuously stellate-hairy on the outer surface but rather sparsely so on the inner surface; calyx segments 7-8 mm long, 3.5-4.5 mm wide, papery, purplish, both surfaces variably stellate-hairy; petals less than 1 mm long, red and somewhat glandular; anthers red-brown, c. 2 mm long; style glabrous. Capsule enclosed in the calyx. Flowers September-March (VicFlora, 2019).

Generation Length

The generation length of *Thomasia petalocalyx* is suspected to be 10 to 30 years. No information on the longevity of this small shrub was located, but observations suggest that it is reasonably long-lived. Based on expert advice in relation to similar species, the NSW Threatened Species Scientific Committee (2019) estimated that *Lasiopetalum behrii* (a similarly-sized shrub from the same family as *T. petalocalyx*) reaches reproductive maturity at around two to five years with longevity estimated to be 20-50 years. On this basis, they estimated the generation length of *L. behrii* to be 11 to 28 years. In the absence of better information, the life span of *T. petalocalyx* is suspected to have a similar longevity, with a generation length in the vicinity of 10-30 years. While it has at least some capacity to resprout, the potential role of fire in triggering seed germination of *T. petalocalyx* was not determined.

Distribution

In Victoria, in scattered locations west of Port Phillip Bay to the border with South Australia but absent from the north and east of the State, with the exception of Wilsons Promontory National Park.

Habitat

The taxon occupies dry forest, heathy woodland and coastal heath.

Threats

Threats to this taxon include exposure to severe coastal storms , with increasing severity due to climate change (Wilsons Promontory N.P. populations),and inappropriate fire regimes(Wilsons Promontory, Victoria Valley, Lake

Mundie), unauthorized grazing (Lake Mundie), coastal development (Anglesea) and restriction to small areas of suitable habitat (Port Campbell).

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 30 to 90 years is inferred to be 15 to 60 percent (midpoint 45%), based on (b), (c) and (e) above.

While substantial losses are anticipated in the future, principally due to land clearing and altered fire regimes, they are difficult to quantify due to the uncertainty associated with generation time. If the shorter ten-year time-frame is used, then it is unlikely that the reduction in population exceeds 30%, but may exceed this figure if the longer, three generation (~90 years) timespan is accepted.

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 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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 208 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented both anthropogenically and naturally. It is inferred to have four locations. It has a continuing decline in (i), (ii), (iii) and (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:

Ineligible under Criterion C as Data Deficient

There is insufficient evidence to determine the number of mature individuals.

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:

Ineligible under Criterion D

There is insufficient evidence to determine the number of mature individuals.

Relevant population data are unavailable.

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

References

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne.

NSW Threatened Species Scientific Committee (2019). *Lasiopetalum behrii* - critically endangered species listing. Retrieved from: https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/nsw-threatened-species-scientific-committee/determinations/final-determinations/2008-2010/lasiopetalum-behrii-critically-endangered-species-listing

VicFlora (2019) Flora of Victoria, Royal Botanic Gardens Victoria: *Thomasia petalocalyx*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/c4e442bd-bb80-4d3a-a550-c0c27e96aaa8