

Tetratheca thymifolia Thyme Pink-bells

Taxonomy

Tetratheca thymifolia Sm.

Current conservation status

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

Proposed conservation status

Vulnerable in Victoria

Criterion D2

Species Information

Description and Life History

The taxon is an erect or straggling shrub to c. 1 m high; stems with dense tubercle-based, spreading, twisted or curled setae to c. 1.5 mm long or more sparse antrorse setae, rarely glabrous. Leaves mostly in whorls of 3-5, rarely a few opposite or alternate, narrow- to broad-elliptic, rarely almost linear or suborbicular, mostly 5-15 mm long, 1-8 mm wide, acute or obtuse, often mucronate, margins flat to revolute, surfaces variously hairy particularly on midvein and near margins. Inflorescences 1- or rarely 2-flowered; peduncles elongating, 5-23 mm long in mature flowers, densely or sparsely covered with hairs of various length, rarely glabrous. Sepals lanceolate to broad-ovate, mostly 2.5-3 mm long, often glandular-hairy, deciduous; petals c. ovate, 6-15 mm long, deep lilac-pink or white, deciduous; ovary usually densely hairy; ovules 4. Fruit cordate to obcordate, 4-6 mm long; seeds more or less ovoid, 2.5-3 mm long, turgid. The taxon flowers mostly from September to November (VicFlora 2014).

Generation Length

The generation length of *Tetratheca thymifolia* is estimated to be 45 to 90 years. By analogy with other *Tetratheca* taxa, the taxon is inferred to be long-lived, potentially capable of some resprouting following all but the most intense fires, and likely to recruit episodically following bushfire at plausible pre-settlement intervals of 35-90 years.

Distribution

The taxon is known in Victoria from only two localities: Mt Buffalo (1913 record) and near Mallacoota (1938 and 1987 records). The taxon also occurs in Queensland and New South Wales (VicFlora 2014).

Habitat

The 1987 Mallacoota collection recorded habitat information as coastal heath. The habitat range of the taxon in coastal districts of southern NSW includes Lowland Forest, as well as coastal heath. The habitat of the 1913 collection from Mount Buffalo is unknown.

Threats

Threats to the two known highly disjunct Victorian occurrences are difficult to identify with any confidence. Plausible threats to occurrences in coastal heath include the increasing frequency, intensity, and landscape scale of both bushfire and planned burns which, coupled with increasing drought stress, increase the risk of recruitment failure, seedbank depletion and, ultimately, local extinction. In the Mt Buffalo area, the taxon may be impacted by climatic

Tetratheca thymifolia

Thyme Pink-bells

warming and drying which, synergistically, increase the risk of recruitment failure in response to repeat fire events and extreme drought stress.

The bushfires of 2019/2020 are believed to have impacted around 51% of the taxon's modelled habitat. The overall impacts of the fire are yet to be determined.

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:

Ineligible under Criterion A

There is insufficient evidence to determine whether there has been or will be a reduction in population sufficient to meet any threshold for Criterion A.

Tetradheca thymifolia

Thyme Pink-bells

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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 8 km² and the Area of Occupancy (AoO) is estimated to be 8 km², but other thresholds under this criterion have not been met. There is insufficient evidence to indicate whether the identified threats currently operate with sufficient intensity to result in a continuing decline in population size, habitat or any other demographic parameter.

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

Tetratheca thymifolia

Thyme Pink-bells

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 km ² or number of locations ≤ 5

Evidence:

Eligible under Criterion D2 as Vulnerable

The taxon is estimated to be very restricted, with an AoO of 4 or 8 km² and one or two locations. This restriction makes the taxon capable of becoming Critically Endangered or Extinct within a time frame of one or two generations in response to the impacts of the identified long-term threats, notably increasing fire frequency and intensity, and increasing drought stress.

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. 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

VicFlora (2014). Flora of Victoria, Royal Botanic Gardens Victoria: *Tetratheca thymifolia*. Retrieved from:

<https://vicflora.rbg.vic.gov.au/flora/taxon/b5b18cf8-08d7-4363-86ad-64942640b6f2>