Threatened Species Assessment

Leucopogon thymifolius
Thyme Beard-heath

Taxonomy

Leucopogon thymifolius Lindl. ex Benth.

Current conservation status

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

Proposed conservation status

Vulnerable in Australia

Criteria C1; D2

Species Information

Description and Life History

The taxon is a slender shrub to c. 1.2 m. high; branchlets hispid to pilose. Leaves widely spreading to reflexed, ovate to oblong, 2.5-11 mm long, 0.5-2 mm wide, convex, concolorous or slightly discolorous, both surfaces and margins long-hispid to pilose, venation indistinct; apex acute, slightly thickened, recurved. Flowers white to pale pink, crowded to rather sparse, (3-)7-13 in spikes 7-25 mm long in upper axils, or spikes clustered on leafless branch-tips; bracteoles ovate, 0.8-1.5 mm long, acute, sparsely to moderately hispid; sepals narrowly ovate, 1.3-2.2 mm long, acute to acuminate, hispid; corolla 1.6-2.5 mm long, lobes slightly longer than tube, acute, erect or spreading, densely bearded within; anthers with short, recurved sterile tips; ovary 3-5-locular, glabrous, style 0.3-0.5 mm long. Fruit ellipsoid to obovoid, c. 2-3 mm long. Flowers from September to November (VicFlora 2019).

A variant with leaves shorter than typical (2-4 mm long), and shorter, more crowded flower spikes occurs on Mt William and nearby on the Major Mitchell Plateau, and at Mt Abrupt. It vegetatively resembles *L. microphyllus* var. *pilibundus,* but has floral characters of typical *L. thymifolius* (VicFlora 2019).

The taxon has a broader ecological amplitude than the similar Grampians endemic *L. neurophyllus* and is likely to be less fire-sensitive or at least better adapted to fire and recruiting reliably post-fire. It is also less likely to resprout post-fire.

Soil stored seedbanks are unlikely to persist for more than ten years even if they represent a significant source of seed for germination. Seed banks may be largely elevated within the canopy of the adult plant with some local dispersal by animal vectors, however, the fruit of this taxon is unlikely to be succulent compared with many taxa in cooler, wetter or coastal habitats. The fruit is also likely to be too dry for longer distance dispersal, hence it is likely to be dispersed potentially only at the metre scale by ants.

Generation Length

The generation length of *Leucopogon thymifolius* is estimated to be 30 to 40 years. This is based on an estimated longevity of 25 to 35 years, and recruitment that is likely to be more episodic and fire-cued than continuous, with pre-European settlement fire interval plausibly in the 30-50 year range.

Distribution

The taxon is confined to the Grampians and nearby Pomonal, including the Mt William, Serra, Victoria, and Mt Difficult Ranges (VicFlora 2019).

Habitat

The taxon occurs in open-forest and heathy woodland, usually in elevated sites (VicFlora 2019).

Threats

The taxon is threatened in the long-term by the impacts of climatic drying and warming and imposed fire-regimes. This results in increased risk of repeat fire events at intervals below the tolerable fire interval for the taxon, with increasing risk of drought-induced recruitment failure.

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:

Ineligible under Criterion A

The past population reduction does not meet the threshold for eligibility under criterion A2, and the future population reduction does not meet the threshold for eligibility under criterion A3.

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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 1,792 km² and the Area of Occupancy (AoO) is estimated to be 256 km², but other thresholds under this criterion have not been met.

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 Vulnerable

It is estimated that there are 2,000 to 20,000 mature individuals. This is based on field observations of representative subpopulations.

There is estimated to be a continuing decline of 10 to 20% within three generations, based on the current and projected impact of imposed fire-regimes, climatic drying and warming, extreme drought stress and the increasing risk of repeat fire events at intervals below the tolerable fire interval of the taxon.

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 D2 as Vulnerable

The taxon is estimated to be very restricted. The taxon has a restricted distribution, occurring in a single location, such that this restriction makes the taxon capable of becoming Critically Endangered or Extinct within a time frame of one or two generations. This is in response to the impact of the identified long-term threats.

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 (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Leucopogon thymifolius.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/53989af3-47f0-4355-a333-a989b828c52c