Threatened Species Assessment

Treubia tasmanica
Treubia

Taxonomy

Treubia tasmanica R.M. Schust. & G.A.M. Scott

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2008).

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

Proposed conservation status

Critically Endangered in Victoria

Criteria A3ce+4ce; B1ab(ii,iii,iv,v); C2a(i)

Species Information

Description and Life History

Treubia tasmanica is a thallose liverwort characterised by leaf-like lobes and the presence of wing-like lobules on the dorsal surface. It produces a mucus-like secretion that binds the thallus to the substratum. It reproduces by gemmae as well as spores.

Generation Length

The generation length of *Treubia tasmanica* is estimated to be 11 to 25 years. This is as proposed by Hallingbäck et al. (2000) for 'long' life taxa ('long-lived shuttles - perennial stayers') that are known to produce sporophytes.

Distribution

Six populations were recorded in Victoria: one along the Kinglake-Yea Road and five on the southern slopes of the Baw Baw Range. The Kinglake-Yea population has not been relocated despite several searches by bryologists, and is presumed extinct as a result of road widening. The Charity Creek (Baw Baws) population is extinct as a result of a landslip (D. Meagher pers. obs.). The population on the West Tyers River is very small and has declined significantly in recent years (N. Scarlett, pers. comm.). The population on Long Creek was discovered in 1997 and consists of only a very few plants (N. Scarlett pers. comm.).

Habitat

Treubia tasmanica grows on soil in humid habitats close to streams. In Victoria it is confined to Riparian Forest, Wet Forest and Cool Temperate Rainforest above 450 m elevation.

Threats

All extant subpopulations are vulnerable to stochastic events such as landslips and the effects of human activity, including roadinfg and forestry operations. The West Tyers subpopulation has been affected by the construction of a large road close by, which has caused siltation at the site and a large landslip close to the site. These events contributed to a visible decline in the population (N. Scarlett pers. comm. 2012).

Other potential threats at this site are habitat loss or alteration, weed invasion, and physical disturbance from humans because of easy access to the river from the new road. Changes in habitat caused by climate change,

particularly changes in hydrology and the risk of more frequent and more severe bushfires, are continuing threats at all sites.

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 33 to 75 years is inferred to be 33 to 50%, based on (c) and (e) above.

Two of the six known sites (Yea-Kinglake and Charity Creek in the Baw Baws) have been destroyed; the former by roadworks and the latter by a landslip. It is inferred that at least 33% of the total population has therefore been lost in the last 75 years. The continuing decline in Cool Temperate Rainforest (CTRF) habitat (DSE 2009) is likely also to have contributed to the loss of habitat for the taxon.

Eligible under Criterion A3 as Critically Endangered

The population reduction over the next 33 to 75 years is projected to be 50 to 100% (midpoint 80%), based on (c) and (e) above.

As demonstrated by the loss of two sites in the last 40 years, small-scale events such as landslips and human disturbance could destroy whole subpopulations. The continuing decline of CTRF and the associated risk of more frequent and more severe fires is also likely to affect extant populations.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 33 to 75 year period, including both past and future, is projected to be 50 to 100% (midpoint 80%), based on (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 B1 as Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 27 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas, and also on accepted AVH records.

The taxon is inferred to be severely fragmented. Although the populations are on the southern slope of the Baw Baw Range, they are several kilometres apart, with no opportunity for gene flow between them, and little or no opportunity to recolonise if a subppopulation is lost

It is projected to have one location, and has a continuing decline in (ii), (iii) and (iv) above. Cool Temperate Rainforest habitat in Victoria is threatened as a result of climate change, leading to an associated loss of individuals. Other threats at sites, particularly the risk of more frequent and more severe fires as a result of climate change, are also likely to diminish populations over time.

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 50 to 250 mature individuals, based on past surveys and monitoring.

There is an inferred continuing decline, and the number of mature individuals is each subpopulation is 20 to 100.

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 50 to 250 mature individuals.

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

References

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