

Hymenodontopsis bifaria Umbrella Thyme-moss

Taxonomy

Hymenodontopsis bifaria (Hook.) N.E.Bell, A.E.Newton and D.Quandt

This was previously known as *Pyrrhobryum bifarium* (Hook.) Manuel. *Hymenodontopsis bifaria* was transferred from *Pyrrhobryum* to *Hymenodontopsis* by Bell, Quandt, O'Brien and Newton in 2007 in *Bryologist* 110: 555.

Note that as of January 2021, a search on either of these names in AVH does not bring up this taxon. However, a search on 'Umbrella Thyme-moss' does.

Current conservation status

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

Proposed conservation status

Critically Endangered in Victoria.

Criteria A3c+4bc; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

However it has not been seen since 1961 and may be extinct in Victoria.

Species Information

Description and Life History

Hymenodontopsis bifaria is an acrocarpous moss with a dendroid or semi-dendroid habit. It is dioicous, and capsules seem to be common.

Generation Length

The generation length of *Hymenodontopsis bifaria* is estimated to be 11 to 25 years. This is based on guidelines in Hallingbäck *et al.* (2000) for long-lived shuttle / perennial stayer species.

Distribution

Gilmore (2012) stated that the Australian distribution is only from NSW and Tasmania, but there are numerous confirmed records from Victoria, ACT and Queensland. In Victoria, the taxon is known from two sites in the Otways. The only known date of collection in the Apollo Bay area is 1874, although an undated collection in MEL (Saunders s.n.) was probably made by Don Saunders in the 1960s or early 1970s (D. Meagher, pers. obs.). The only collections from The Canyon near Lorne were made in 1975 (Australian Virtual Herbarium (AVH) data). It was previously recorded in Tarra-Bulga National Park (NP) in 1961 but has not been seen since, despite visits by numerous bryologists including about 15 during the Australasian Bryological Workshop in 2003. The taxon is therefore considered likely to be extinct in Victoria.

Habitat

The taxon grows on rotting logs and stumps, and occasionally on soil and rock, in wet forest and rainforest. In Victoria the taxon is known from wet forest in the Otways and Cool Temperate Rainforest in Tarra-Bulga NP (AVH records).

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Threats

Loss of Cool Temperate Rainforest (CTRF) as a result of climate change is a key threat to the Tarra-Bulga subpopulation, if it still occurs there, not having been seen since 1961.

Drying of its habitat and the risk of more frequent and more severe fires are threats at the two Otways localities. Phantom Falls at The Canyon site was completely dry in 2015, and there have been numerous recent tree-falls at the site (D. Meagher pers. obs.).

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>based on any of the following:</p>	<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>
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Evidence:

Eligible under Criterion A3 as Critically Endangered

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

Any populations still extant in the Otways are likely to be impacted by a deterioration in habitat resulting from climate change, as well as by increased frequency and severity of bushfires.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 33 to 75 year period, including both past and future, is estimated to be 50 to 100%, based on (b) and (c) above. The causes of reduction may not have ceased, be understood or be reversible.

The Tarra-Bulga population is considered likely to be extinct. Other populations in Cool Temperate Rainforest that might exist are likely to have declined as a result of climate change since the 1950s.

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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:

Eligible under Criterion B1 as Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 8 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA). The EoO is made equal to AoO consistent with the definition of AoO as an area contained within the EoO.

The taxon is estimated to be severely fragmented, as it is known from only two widely spaced sites with no possibility of genetic exchange between them.

It is estimated to have one location. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, as a result of loss of habitat and increasing fire risk.

Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 8 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it severely fragmented, has 1 location and has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

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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

. Nothing is known about the number of individuals in the subpopulations.

Criterion D. Very small or restricted populations				
		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.

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

References

DSE (2009). Action Statement No. 238. Cool Temperate Rainforest, Dry Rainforest (Limestone), Warm Temperate Rainforest (Coastal East Gippsland), Warm Temperate Rainforest (Cool Temperate Overlap, Howe Range), Warm Temperate Rainforest (East Gippsland Alluvial Terraces), Warm Temperate Rainforest (Far East Gippsland), Human activity which results in artificially elevated levels of Myrtle Wilt within *Nothofagus-dominated* Cool Temperate Rainforest. Department of Sustainability and Environment: East Melbourne.
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