



Mesochaete undulata Jungle Thyme-moss

Taxonomy

Mesochaete undulata Lindb.

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 A2ac+3bc+4ac; B1ab(i,v)+2ab(i,v)

Species Information

Description and Life History

M. undulata is a large acrocarpous moss. It is dioicous and sporophytes are uncommon in Victorian plants. However, the leaves at the shoot tips are deciduous, so asexual reproduction is probably common.

Generation Length

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

Distribution

In Victoria the taxon is known only from five localities in far East Gippsland.

Habitat

The taxon grows on soil, rotting wood, rocks, and tree and tree-fern trunks in wet sclerophyll forest and rainforest.

Threats

More frequent and more severe fires as a result of climate change are a threat to all populations. A major fire reached close to the Brodribb locality in 2003 (Forests Victoria mapping) and the 2019/20 bushfires are likely to have affected plants in the Mallacoota, Mt Drummer areas. Drying of habitats as a result of climate change is also a threat as the taxon grows only in very wet sites, and at least one locality (Double Creek) has become dry recently (D. Meagher pers. obs. 2009).

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Jungle Thyme-moss

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:

Eligible under Criterion A2 as Endangered

The population reduction over the last 33 to 75 years is suspected to be 40 to 60%, based on (a) and (c) above.

It is assumed that at least two of the five known populations have become extinct since they were discovered, and given the fires in 2019/2020 a significant part of the taxon's range may have been lost.

The causes of reduction may not have ceased, be understood or be reversible.

Eligible under Criterion A3 as Endangered

The population reduction over the next 33 to 75 years is suspected to be 50 to 85% (midpoint 70%), based on (b) and (c) above.

All Victorian populations are in fire-prone areas of Gippsland. A drier climate under climate change is likely to impact existing populations and limit the opportunity to become established in other suitable areas.

Eligible under Criterion A4 as Endangered

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

Mesochaete undulata

Jungle Thyme-moss

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 and B2 as Endangered

The Extent of Occurrence (EoO) is estimated to be 2,008 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The Area of Occupancy (AoO) is estimated to be 16 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

The taxon is estimated to be severely fragmented. It is likely that only the Mt Drummer and Cabbage Tree FFR populations, and possibly the Brodrigg population, are extant. These are widely separated, and genetic exchange between the populations would be impossible.

The taxon is considered to occur in one location as the key threats of climate-induced drying and increased fires apply across its range and can rapidly affect all individuals of the taxon present.

It has a continuing decline in (i) and (v) above.

Mesochaete undulata

Jungle Thyme-moss

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

It is suspected that there are 220 mature individuals, but the qualifier is too weak.

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 D as Vulnerable

The taxon is observed to be very restricted.

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:



Mesochaete undulata Jungle Thyme-moss

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