

Plagiomnium novae-zealandiae Thyme Moss

Taxonomy

Plagiomnium novae-zealandiae (Colenso) T.J. Kop.

Scott and Stone (1976) referred Australian plants to *Mnium rostratum* (= *Plagiomnium rostratum* (Scrad.) Koponen), but that is a Northern Hemisphere taxa. However, their description is accurate for *P. novae-zealandiae*.

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 A3bc+4bc; B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

P. novae-zealandiae is a synoicous moss in which upright fertile branches arise from a creeping leafy stem. It is commonly polysetous.

Generation Length

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

Distribution

The taxon occurs in east Gippsland, at Little River Falls, Upper Cobungra River, Mount Buller Road, Upper Jamieson River, Den of Nargun, Bryces Gorge, Dinner Creek, and Dennisons Plain. It also occurs in NSW, Qld, New Zealand, and Norfolk Island. Some northern NSW and Qld records might be errors for *Orthomnion elimbatum*, an outwardly similar taxon.

Habitat

The taxon grows on rock and sometimes tree branches in wet sclerophyll forest, cool temperate rainforest, and alpine woodland, always immediately adjacent to running water.

Threats

Change in water availability and hydrology as a result of climate change is a threat to this taxon because of its habitat preference. The associated risk of more frequent and intense fires is also a threat.

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 A3 as Endangered

The population reduction over the next 33 to 75 years is suspected to be 30 to 70% (midpoint 50%), based on (b) and (c) above.

Drying of the riparian habitat as a result of climate change, together with an increase in the number and severity of bushfires, is likely to cause a reduction in the population of this taxon.

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 30 to 70% (midpoint 50%), based on (b) and (c) above. The causes of reduction may not have ceased, be understood or be reversible.

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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 Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 13,000 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is inferred to be severely fragmented as only plants at Bryces Gorge, Dinner Creek, and Dennisons Plains are likely to be close enough to exchange genes. The remainder are isolated, with little chance of recolonisation from interstate because of habitat loss due to climate change.

It is inferred to have a continuing decline in (i), (ii), (iii), (iv) and (v) above as a result of climate change.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 28 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon is severely fragmented, 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

It is suspected that there are 150 to 370 mature individuals, but the qualifier is too weak and other thresholds under this criterion have not been met.

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: AaO: < 20 km ² or number of locations ≤ 5

Evidence:

Eligible under Criterion D as Vulnerable

It is suspected that there are 150 to 370 mature individuals.



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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.

DSE (2009). Action Statement – Cool Temperate Rainforest, Dry Forest (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 -dominate Cool Temperate Rainforest (No. 238). Department of Sustainability and Environment: East Melbourne. Retrieved from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0016/32452/Human-activity.pdf

Hallingbäck, T., Hodgetts, N., Raeymaekers, G., Schumacker, R., Sérgio, C., Söderström, L., Stewart, N. and Váða, L. (2000). Guidelines for application of the 1994 IUCN Red List categories of threats to bryophytes. Appendix 1 in Hallingbäck T. and Hodgetts N., *Mosses, Liverworts and Hornworts. Status Survey and Conservation Action Plan for Bryophytes*. IUCN: Gland, Switzerland.

Scott, G.A.M. and Stone, I.G. (1976). *The mosses of southern Australia*. Academic Press: London.