Threatened Species Assessment

Monotoca oreophila
Mountain Broom-heath

Taxonomy

Monotoca oreophila Albr.

M. oreophila is the entity listed as *M*. sp. aff. *elliptica* (Alps) by Ross in the 4th (1993) edition of *A Census of the Vascular Plants of Victoria* (Albrecht, 1995).

Current conservation status

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

Proposed conservation status

Vulnerable in Australia

Criterion D2

Species Information

Description and Life History

The taxon is a procumbent to erect shrub 0.2-2.5 m high; branchlets puberulous or almost glabrous. Leaves dense, lanceolate to elliptic, 3.8-11 mm long, 1.4-2.8 mm wide, mucronate, convex, glabrous, lower surface whitish; margins slightly recurved, smooth; petiole glabrous. Flowers axillary, solitary, on current season's growth; all or most axes growing beyond flowering region while plants flowering; peduncles 0.2-1.7 mm long; bracts caducous or leaf-like; bracteoles 0.5-1.1 mm long; sepals 0.6-1 mm long; corolla whitish-cream, campanulate, 1.1-1.9 mm long in female flowers; 1.4-2.5 mm long in males; lobes glabrous or rarely sparsely papillose, c. twice as long as tube; anthers 0.8-1.2(-1.3) mm long, exserted from the corolla tube; ovary plus style 0.7-1 mm long. Fruit ovoid, 2.2-3 mm long, red-orange at maturity. The taxon flowers from November to January. Plants on Mt Useful are unusually tall but are typical in all other respects (VicFlora 2021).

The taxon is a densely foliose non-lignotuberous shrub, with a fruiting period occurring from January to April (Albrecht 1995).

Generation Length

The generation length of *Monotoca oreophila* is estimated to be 50 to 90 years. This is based on a plausible longevity of 50-100 years or more and an inference that the taxon is likely to recruit continuously from seed dispersed locally by biotic vectors in the absence of fire.

Intense fire is likely to kill mature adults, which lack a lignotuber, and are inferred to be fire-sensitive obligate seed regenerators. It is unclear whether the taxon recruits from elevated or soil-stored seedbanks following fire or is dependent on biotic dispersal from unburnt refugia. The pre-settlement fire interval is likely to have been in the 45-120 year range with the most topographically protected sites often escaping fire altogether.

Distribution

The taxon is endemic to Victoria and is confined to relatively few sites, from Mt Baw Baw north-east to Mt Kent. Bioregions include the Highlands-Southern Fall, Victorian Alps, and the Snowy Mountains (VicFlora 2021). All eight subpopulations are presently known occur in biological reserves, though most are very localised, and some consist of few plants (Albrecht 1995).

Habitat

M. oreophila is exclusively a montane-subalpine taxon, occurring at altitudes of 1000-1620 m. All known sites are rocky, often with surface boulders. Occurrences do not appear to be associated with a particular rock type, as populations occur on granodiorite, sandstone, rhyolite and conglomerate. Most populations occur under an open canopy of eucalypts, though occasionally trees are absent, and the vegetation is of a heathland or shrubland structure (Albrecht 1995). Associated *Eucalyptus* taxa are *E. pauciflora*, *E. glaucescens, E. kybeanensis*, and rarely also *E. delegatensis* and *E. nitens*. Frequently associated understorey taxa include *Tasmannia vickeriana, Leucopogon gelidus, L. maccraei, Olearia megalophylla* and *Dianella tasmanica*. The more exposed and drier cliff edge population at Nelsons Crag supports a different range of associated taxa, including *Grevillea miqueliana, Leptospermum brevipes, Monotoca scoparia, Westringia senifolia, Callistemon pallidus* and *Veronica perfoliata* (Albrecht 1995).

Threats

The taxon is threatened by climatic drying and warming, which together with imposed anthropogenic fire regimes increases the risk of adult mortality and recruitment failure. Since the taxon is a non-lignotuberous, fire-sensitive obligate seed regenerator, it is particularly vulnerable to repeat fire events at intervals below its tolerable fire interval. Such events which are projected to increase in frequency, intensity, and landscape scale, threaten the taxon with adult mortality, recruitment failure, seedbank depletion and exhaustion, and local extinction. Recruiting stands are particularly susceptible to recruitment failure in response to extreme drought events, and potentially also to targeted browsing by Sambar Deer (*Rusa unicolor*), which are currently undergoing growing in population across the range of the taxon.

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

There is insufficient evidence to determine whether there has been or will be a reduction in population sufficient to meet any threshold for Criterion A.

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 suspected to be 3,925 km² and the Area of Occupancy (AoO) is suspected to be 76 km², but the qualifiers are too weak, and 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:

Ineligible under Criterion C as Data Deficient

There is insufficient evidence to determine the number of mature individuals.

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, notably climatic drying and warming, imposed anthropogenic fire regimes, extreme drought events, and target browsing by Sambar Deer.

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

References

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