



Luzula acutifolia subsp. *acutifolia* Sharp-leaf Woodrush

Taxonomy

Luzula acutifolia subsp. *acutifolia* H. Nordensk.

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 A2bce+3c+4c; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a tufted, isolated plants or colony-forming and connected by short, thick rhizomes, usually with a thick layer of fibrous leaf remains at base of plant, flowering stems erect, to 20 cm high, far exceeding leaves. Leaves strongly channelled, 1-2 mm wide, stiff, margins prominent, pale, mostly glabrous to very sparsely ciliate, but densely ciliate near base; at least the young leaves and leafy bracts acute at apex. Inflorescence a single dense ovate cluster c. 1 cm long and 0.8 cm wide, rarely with one or two smaller pedunculate clusters; tepals acuminate, 2.5-3.2 mm long, dark brown to almost black, with narrow, pale, membranous margins near apex; anthers 0.8-1.3 mm long; capsules slightly shorter or equal to tepals, shining dark brown or almost black; seeds c. 1.3 mm long excluding caruncle which is c. one-eighth as long as seed. The taxon flowers from November to February (VicFlora 2019).

Generation Length

The generation length of *Luzula acutifolia* subsp. *acutifolia* is estimated to be 30 to 50 years. Fire is historically rare in alpine ecosystems, occurring perhaps once or twice a century and, on average, perennial shrubs and herbs are likely to reach the end of their reproductive life prior to another fire. In undisturbed vegetation, the average plant age is likely to be at the older end of the estimated lifespan, reflecting the recruitment pulse after fire and lower-level recruitment thereafter.

Distribution

The taxon is known from the Bogong High Plains and adjacent peaks (Mts Bogong, Nelse, Jim, Loch, Basalt Hill), Mt Hotham, Mt Reynard, and Mt Buffalo. The taxon also occurs in Tasmania (VicFlora 2019).

Habitat

The taxon occurs in shallow soils in areas where patches of late-lying snow regularly occur (VicFlora 2019).

Threats

This taxon is dependent on late-lying snow, so subpopulations and the habitat are considered at risk from increasingly dry conditions from declining rainfall/snowfall. The taxon is also threatened by disturbance from feral animals and invasion by exotic weeds and native shrubs.

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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> <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>			

Evidence:

Eligible under Criterion A2 as Endangered

The population reduction over the past 90 to 150 years is estimated to be 50%, based on (b), (c) and (e) above.

Given that around 50% of alpine wetland areas have been lost since settlement (Costin *et al.*, 1959; Wimbush, 1970), it is reasonable to assume there has also been a 50% loss of habitat, and therefore the plant population.

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

Eligible under Criterion A3 as Endangered

The population reduction over the next 90 to 100 years is projected to be 60 to 80% (midpoint 70%), based on (c) above.

Future reduction of the taxon's population is based on projected reduction of snow cover and climate drying which will see a large reduction in habitat required by this taxon which is dependent on late-lying snow cover.

Eligible under Criterion A4 as Endangered

The population reduction over any 90 to 150 year period, including both past and future (up to 100 years in the future), is projected to be 60 to 80% (midpoint 70%), based on (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 Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 1,971 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented. There are multiple, small isolated subpopulations that are all at risk from climatic drying, leading to reduced snow cover, such that there is an increased extinction risk and little or no probability of recolonisation should subpopulations become extinct

It is estimated to have 2 locations, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the current and projected impact of the identified threats, such as climatic drying and the reduction of snow cover.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 124 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas. As above, the taxon is estimated to be severely fragmented, is estimated to have 2 locations, 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 inferred that there are 8,000 to 15,000 mature individuals, but this 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: 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

Costin, A.B., Wimbush, D.J., Kerr, D., & Gay, L.W. (1959). *Studies in catchment hydrology in the Australian alps. I. Trends in soils and vegetation*. Melbourne: CSIRO Division of Plant Industry.

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VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Luzula acutifolia* subsp. *acutifolia*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/542fd91d-c73f-4361-9c85-42e48af8b2e6>

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