Threatened Species Assessment

Abrotanella nivigena
Snow-wort

Taxonomy

Abrotanella nivigena (F. Muell.) F. Muell.

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

Criterion B1ab(iii,v)

Species Information

Description and Life History

The taxon is a prostrate, rhizomatous herb. Leaves linear, 7-15 mm long, 1-1.5(-2) mm wide, fleshy, obtuse, margins hairy at base, somewhat recurved. Capitulum solitary, subsessile in flower; peduncle elongating to c. 2 cm in fruit; involucral bracts oblong, 3-3.5 mm long, obtuse or truncate, margins scarious. Florets not strongly dimorphic, corollas 3- or 4-lobed, white or white with purple lobes; outer florets 7-17, 1.6-1.9 mm long; inner florets 4-12, male, 2-2.8 mm long. Outer cypselas obovoid, c. 2 mm long, 3- or 4-angled, distinctly ribbed, minutely papillose, apex inconspicuously rimmed, brown, often with a red-brown tip. Inner cypselas infertile, smaller, often compressed. Flowers December to January (VicFlora 2018).

Generation Length

The generation length of *Abrotanella nivigena* is estimated to be 50 to 100 years. This is based on a potentially indefinite longevity inferred from the rhizomatous mat-forming habit. It is also based on the likelihood that recruitment is a rare event, potentially cued by adult mortality and localised site disturbance events, such as exceptionally rare fire events or extreme drought or frost events. The frequency and reliability of seed recruitment is unknown.

Distribution

The taxon is confined to the higher parts of the alps in the vicinity of Mts Bogong and Nelse (VicFlora 2018).

Habitat

The taxon is rare in moist herbfield and bogs (VicFlora 2018). Specifically, the taxon is recorded from erosion pavements along streambed. The taxon is uncommon growing in open areas within *Empodisma minus* sward on wet peaty soil at edge of watercourse and still shallow backwater of a creek at 1760 m elevation.

Threats

The taxon is a habitat specialist threatened by climatic drying of its moist herbfield and bog habitats. The taxon may also be at risk from low seed viability inferred from visual inspection and apparently empty seeds.

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:

Eligible under Criterion B1 as Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 37 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented naturally at the landscape scale since the taxon has no specialised mechanism for long-distance dispersal and each discrete occurrence is isolated by natural local barriers separating moist habitats in distinct subcatchments.

It is estimated to have 1 location. It has a continuing decline in (iii) and (v) above, based on the identified threats, which are well documented to have already resulted in decreasing snow across the Bogong High Plains. This results in reduced seasonal water availability in downslope drainage systems on which this habitat specialist depends for the maintenance of its population.

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 estimated that there are 50 to 300 (midpoint 100) mature individuals, but other thresholds under this criterion have not been met.

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 D as Endangered

It is estimated that there are 50 to 300 (midpoint 100) mature individuals.

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

References

DSE (2014) *Advisory list of rare or threatened plants in Victoria - 2014.* Department of Environment and Primary Industries, Melbourne. Retrieved from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf

VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Abrotanella nivigena*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/a7d8210f-d902-41d8-ae24-6d4de068fda7