Threatened Species Assessment

Ewartia nubigena
Silver Ewartia

Taxonomy

Ewartia nubigena (F. Muell.) Beauverd

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 A2ce+3ce+4ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a silvery, mat-forming herb to c. 50 cm diam. or more. Leaves sessile, obovate to oblanceolate, mostly 4-7 mm long, 1-2 mm wide, obtuse to subacute, base broad and stem-clasping. Capitula campanulate, 4-8 mm diam., sessile; involucral bracts linear-lanceolate to ovate, 2-6 mm long, obtuse. Florets purple, corolla c. 4 mm long. Cypselas c. 1 mm long, brown; pappus 4-5 mm long, white or yellow Flowers January-March (VicFlora 2017).

Members of the Asteraceae are commonly visited by insects (Armstrong 1979), suggesting gene exchange does not occur over a long distance, although the wind dispersal of seeds may occur over a longer distance.

Generation Length

The generation length of *Ewartia nubigena* is estimated to be 30 to 50 years. This is based on the length of seed storage in soil, its rhizomatous nature, and the historic infrequency of large fires. The taxon can resprout after fire, although not immediately after, and is tolerant of establishment within mature vegetation. It is a short-lived perennial to ~10 years, but has seeds that can survive in the seedbank for 50+ years. Regeneration is unlikely to be linked to episodic fire or other disturbance due to its location in sparse vegetation, hence an on-going turnover is assumed.

Distribution

The taxon is found in Highlands-Northern Falls, Snowy Mountains, and Victorian Alps bioregions. In Victoria, It is apparently confined to higher parts of the alps on the Bogong High Plains and adjacent areas, Mt Buffalo, and Mt Cobberas. It is also found in NSW (VicFlora 2017).

Habitat

In Victoria, the taxon is found in low herbfield, often amongst rocks (VicFlora 2017).

Threats

This taxon is regarded as a flagship taxon affected by past cattle grazing at both Kosciuszko and the Bogong High Plains (Good and Johnson 2019). Cattle trampling is likely to have been as damaging as targeted browsing and grazing.

Current threats include changes in fire frequency, and elevated temperatures leading to potential colonization of habitat by highly competitive grasses and shrubs, especially given exceptional exposure of habitat to extreme temperature and drought stress in typically skeletal sites.

The taxon is subject to continuing decline in habitat quality and, by inference, in subpopulation number, population size, area of occupancy, and less confidently, extent of occurrence. Local extinction at the Cobberas sites is less of a risk than at some sites on the Bogong High Plains, and particularly Mt Hotham which is subject to a number of additional threats including recreational activity associated with ski fields, and resulting weed invasions, potentially including *Juncus effusus* (Soft Rush).

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:

Eligible under Criterion A2 as Endangered

The population reduction over the past 90 to 150 years is estimated to be 30 to 50%, based on (c) and (e) above.

Past decline is based on past cattle grazing and trampling at both Kosciusko and the Bogong High Plains, as well as an increase in fire frequency and severe drought, increasing temperatures, competition with grasses, shrubs, and weeds, and recreational activity associated with ski fields.

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 40 to 60%, based on (c) and (e) above.

Future decline is based on the impact of the identified threats. While cattle grazing is now removed from the taxon's habitat, feral horses and deer could still impact on exposed feldmark habitat, which would have difficulty recovering

from the ensuing physical damage. It can be confidently anticipated that a population decline of 50% in the next 100 years is likely.

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 inferred to be 30 to 60%, based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

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 Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 1,272 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the landscape scale. It has a patchy distribution with most occurrences isolated from other occurrences at separations exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal.

It is estimated to have 2 locations, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the impacts of the identified threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 92 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon is severely fragmented, has 2 locations, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

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 30,000 to 50,000 mature individuals, which exceeds the thresholds for criterion C.

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:

Ineligible under Criterion D

It is estimated that there are 30,000 to 50,000 mature individuals, which exceeds the thresholds for criterion D.

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

References

Armstrong J. A. (1979) Biotic pollination mechanisms in the Australian flora - a review. *New Zealand Journal of Botany* 17, 467-508.

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014.* Department of Environment and Primary Industries, Melbourne.

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