Threatened Species Assessment

Olearia frostii
Bogong Daisy-bush

Taxonomy

Olearia frostii (F. Muell.) J.H. Willis

Current conservation status

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

Proposed conservation status

Vulnerable in Australia

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

Species Information

Description and Life History

Low, often straggling greyish shrub to 40(-80) cm high; branchlets densely covered by stellate hairs. Leaves alternate, subsessile, obovate, 8-30 mm long, 5-13 mm wide, green or grey-green above with mid-dense stellate hairs, grey-white and densely stellate-tomentose below; margin flat to or recurved, shallowly crenate to dentate toward the obtuse apex, or entire. Capitula 25-50 mm diam., solitary to few terminating branches, peduncles mostly 3-10 cm long; involucre c. hemispherical, 9-12 mm long; bracts 3-5-seriate, subequal, densely stellate-tomentose. Ray florets 30-80, mauve to pink, ligules 8-15 mm long; disc florets c. 40-100, yellow. Cypsela narrow-obovoid, 2.5-4 mm long, 6-ribbed, glabrous; pappus bristles pale, 5-7 mm long. Flowers Jan.-Mar (VicFlora 2020).

It can establish immediately after fire and in later years as vegetation ages, right through to mature and over-mature vegetation (assuming suitable seasonal conditions).

Generation Length

The generation length of *Olearia frostii* is estimated to be 20 to 60 years. DELWP's Vital Attribute database suggests that species reaches reproductive maturity by 5 years, as a medium-lived perennial lives for 10-50 years, and has seeds that survive in the soil for perhaps 100 years. This suggests that the average age of plants is likely to be at the mature end of the range, perhaps around 40 years.

Distribution

The taxon is endemic in Victoria, where it is confined to the Bogong High Plains and nearby peaks (e.g. Mounts Hotham, Loch and Feathertop), but there is locally common (VicFlora 2020).

Habitat

The taxon is confined to heathland, grassland and *Eucalyptus pauciflora* woodland. It extends only occasionally into Snowgum *(Eucalyptus pauciflora*) Woodland (Messina et al 2014, VicFlora 2020).

Threats

The taxon is also found in grassland and heathland, of which the former at least is preferred for grazing by cattle, and it is likely to have been subject to physical disturbance by this grazing in the past

Alpine species are prone to range contraction due to climate change, of which the impacts are likely to be seen first in marginal, lower-elevation subpopulations. Large fires are becoming more frequent and two fires at a short interval will be particularly detrimental. Increasing impacts of deer might be compensated in some areas by recovery from cattle grazing.

Sambar deer (*Rusa unicolor*) are likely to be an increasing threat throughout the range of the taxon as population density increases, with the greatest risk being targeted browsing of recruiting stands following intense fire events.

While the taxon is locally common in undisturbed vegetation, it is rarely found on road verges. This suggests it may be sensitive to physical disturbance (McDougall 2001).

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 Vulnerable

The population reduction over the past 60 to 180 years is estimated to be 10 to 35%, based on (c) and (e) above.

The taxon is likely to have been subject to physical disturbance by cattle grazing in the past. It is not unreasonable to assume that around one third of the original population would have been lost since European settlement.

Eligible under Criterion A3 as Vulnerable

The population reduction over the next 60 to 100 years is projected to be 10 to 35%, based on (c) and (e) above.

Alpine species are prone to range contraction due to climate change, of which the impacts are likely to be seen first in marginal, lower-elevation subpopulations. Large fires are becoming more frequent and two fires at a short interval will be particularly detrimental. Increasing impacts of deer might be compensated in some areas by recovery from cattle grazing.

Eligible under Criterion A4 as Vulnerable

The population reduction over any 60 to 180 year period, including both past and future (up to 100 years in the future), is estimated to be 20 to 40%, based on (c) and (e) above.

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 Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 617 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas(VBA).

It is estimated to have up to six locations, depending on the likelihood of a fire affecting more than one subpopulation. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the current and projected impacts of the identified threats.

Eligible under Criterion B2 as Vulnerable

The Area of Occupancy (AoO) across the taxon's range is estimated to be 276 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it has up to 6 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 inferred that there are 20,000 to 40,000 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 inferred that there are 20,000 to 40,000 mature individuals.

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. 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

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