Threatened Species Assessment

Leucochrysum alpinum
Alpine Sunray

Taxonomy

Leucochrysum alpinum (F. Muell.) R.J. Dennis & N.G. Walsh

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 B1ab(iii,v)+2ab(iii,v)

Species Information

Description and Life History

Perennial, cottony herbs to c. 50 cm high, woody at base. Leaves whitish-cottony or -woolly. Capitula 2-5 cm diam., hemispherical, bracts reflexed in fruit; outer involucral bracts sessile, oblong or ovate, usually brownish or purplish; intermediate bracts with glandular-hairy claws to 6 mm long, laminae 6-15 mm long, yellow or white, base cottony; inner bracts with a shorter lamina and a scariously-winged claw. Cypselas c. obovoid, 2-3 mm long, obscurely angled, brown, smooth to c. warty; pappus bristles 14-20. The taxon flowers from December to February (VicFlora 2017).

Generation Length

The generation length of *Leucochrysum alpinum* is estimated to be 3 to 7 years. The closely-related species *Leucochrysum albicans* var. *tricolor* is thought to live for 5 to 7 years (Sinclair 2010).

Distribution

In Victoria, the taxon occurs in alpine areas between The Bluff, near Mount Buller, and Mount Bogong. It is also found in New South Wales.

Habitat

The taxon inhabits feldmark and low heathland on shallow rocky soil.

Threats

Climate change resulting in drier conditions, especially prolonged drought, and warmer temperatures, is a threat to this species. As *Leucochrysum alpinum* already occupies high points, it does not have the option of altitudinal migration to escape warmer temperatures. The taxon's rocky habitat is also prone to heating up and drying out. Hence, the taxon may be particularly vulnerable to climate change. *Leucochrysum alpinum* has proven difficult to grow at lower altitudes with higher temperature (Australian Daisy Study Group 2002).

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 Endangered

The Extent of Occurrence across the taxon's range is estimated to be 979 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

It is estimated to have one location as all key identified threats apply across its range and can rapidly affect all individuals of the taxon present. These threats include drier conditions and warmer temperatures.

It has a continuing decline in (iii) and (v) above. Threats such as increased temperature and dryness are expected to become more severe into the future

Eligible under Criterion B2 as Endangered

The Area of Occupancy across the taxon's range is estimated to be 40 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it has one location and has a continuing decline in (iii) 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 as Data Deficient

There is insufficient evidence to determine the number of mature individuals. Estimates for the number of mature individuals over time around Mount Nelse are available. Elsewhere they are lacking. Thus, it is difficult to get an idea of the average subpopulation size and hence to make a reasonable estimate of the total 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.

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

References

Australian Daisy Study Group (2002). *Everlasting daisies of Australia*. C.H. Jerram and Associates Science Publishers, Victoria.

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

Sinclair, S.J. (2010). *Draft Recovery Plan for the Hoary Sunray (Leucochrysum albicans var. tricolor).* Department of Sustainability and Environment, Heidelberg, Victoria.

VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Leucochrysum alpinum*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/46a0af8c-183b-4663-9028-0b434b6dcd82