Threatened Species Assessment

Senecio pectinatus var. *major*
Alpine Groundsel

Taxonomy

Senecio pectinatus var. *major* F. Muell. ex Belcher

There are two varieties of *Senecio pectinatus*. Variety *pectinatus* is a Tasmanian endemic. Variety *major* is the mainland taxon but it also occurs in Tasmania.

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criterion B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

Rhizomatous perennial to c. 40 cm high. Leaves mostly rosetted at base, petiolate, glabrous, lamina ovate, elliptic or obovate in outline, 4–15 cm long, to 25 mm wide, pinnatifid, lyrate, or rarely entire with crenate to serrate, often undulate margins; petiole about as long as or longer than lamina, often purplish. Capitula solitary, terminal on a simple (rarely singly branched) scape bearing a few sessile reduced leaves or bracts, dilated and hollow just below involucre, usually sparsely pubescent; involucre 8–12 mm long; bracts (13–)16–22; bracteoles present. Ray florets (12–)16–22, bright yellow, ligules 9–13 mm long; disc florets c. 50–90, golden-yellow. Cypselas cylindric, narrowed toward apex, 4.5–7 mm long, ribbed, glabrous; pappus of barbellate hairs 5–7 mm long, persistent. The taxon flowers from December to February (VicFlora 2018).

Senecio pectinatus var. *major* is assumed to resprout after moderately intense fires but likely to be killed by severe fire. Reproduction is by seed only but to what extent it forms a soil-stored seedbank is unknown. The breeding system is unknown, that is, whether the plant is self-fertile or an obligate outcrosser. Pollination is by insects, particularly *Lepidoptera* and solitary bees. Fruits are pappose and wind-dispersed, potentially over long distances.

Generation Length

The generation length of *Senecio pectinatus* var. *major* is suspected to be 15 to 30 years. This is based on maximum longevity and continuous recruitment.

Distribution

The taxon occurs in the higher alpine ranges of Victoria c. 1600 m above sea level (e.g., Mt Buffalo, Bogong High Plain, Cobberas, Baw Baw Plateau, Mt Hotham, and Snowy Range) (VicFlora 2018).

Habitat

The taxon occurs on damp ground in treeless alpine herbfield and open heath communities, or fringing *Sphagnum*-dominated communities (VicFlora 2018).

Threats

Climate change (decreased rainfall, increased evaporation, extreme temperatures) and increased intensity and frequency of fires are significant threats. Soil loss on bare, post-fire substrates resulting from severe rainfall events poses a threat. Damage to hydrology, soils and vegetation by feral cattle, feral horses and Sambar Deer (*Rusa unicolor*) is also a threat, as is weed invasion.

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

The past population reduction does not meet the threshold for eligibility under Criterion A2, and the future population reduction does not meet the threshold for eligibility under Criterion A3.

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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 140 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is inferred to be severely fragmented. There are multiple, small, isolated subpopulations that are all at risk from a suite of threats, particularly climate change and weed invasion, such that there is an increased extinction risk and little or no probability of recolonisation should subpopulations become extinct.

It is inferred to have one location. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above due to the identified threats, particularly climate change and weed invasion.

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.

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

Belcher, R.O. (1996) Australian alpine scapose radiate taxa of Senecio (Asteraceae). *Muelleria* 9: 115-131

Costin, A.B., Gray, M., Totterdell, C.J., and Wimbush, D.J. (1979). *Kosciusko Alpine Flora*. Melbourne: CSIRO/Collins Australia.

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Thompson, I.R. (2004). Taxonomic studies of Australian *Senecio* (Asteraceae): 3. Radiate, arid region species allied to *S. magnificus* and the radiate, alpine species *S. pectinatus*. *Muelleria* 20: 111-138.

VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Senecio pectinatus* var. *major.* Retrieved from https://vicflora.rbg.vic.gov.au/flora/taxon/3f0d0dca-ee64-4fbe-aea2-9797e22f22ef