Threatened Species Assessment

Scleranthus fasciculatus
Spreading Knawel

Taxonomy

Scleranthus fasciculatus (R. Br.) Hook. f.

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

The taxon is a lax, straggly, procumbent perennial with non-woody base; stems to 30 cm long, usually hairy. Leaves fascicled, 4-12(-16) mm long, (0.2-)0.3-0.8 mm wide, keeled, incurved, usually hairy; apex apiculate; margin very narrow, scarious, papillose. Inflorescence a pedunculate pair of subsessile flowers; peduncle up to 7(-11) mm long in fruit, usually hairy, otherwise glabrous; bracts usually hairy; pedicels absent, obscure or up to 0.1(-0.5) mm long. Sepals 5, triangular-ovate, 0.4-0.7 mm long, 0.2-0.7 mm wide, juxtaposed in fruit, overlapping at base, margin scarious, midrib keeled; stamens 1, enclosed within the calyx, caducous. Fruit not ribbed, veins obscure, 1.5-2.4 mm long, 0.6-0.9 mm wide. Flowers September-March (VicFlora, no date).

Generation Length

The generation length of *Scleranthus fasciculatus* is estimated to be 20 to 30 years. Vital attribute data that indicates that this taxon must regenerate from seed after fire as it does not appear to resprout. It takes 5 years to reach reproductive maturity, lives for less than 10 years (short-lived perennial), and has seeds that can last for 50+ years in the soil.

The taxon exhibited high species turnover over a 7-year period in quadrats in the Snowy Mountains (Venn et al 2012), suggesting that generation time might be lower than for many other alpine taxa. Given that large disturbance events such as fire are historically infrequent in alpine areas, it is suggested that the generation length could be 20-30 years in undisturbed vegetation, but with substantial uncertainty.

Distribution

The taxon occurs in the higher eastern and north-eastern regions of Victoria. It also occurs in NSW, Tasmania and New Zealand.

Habitat

The taxon is found in grassy woodlands and montane forests, on loamy soils (VicFlora, no date).

Threats

Subpopulations and habitat of the taxon are considered at risk from disturbance, weed invasion, and increasingly dry conditions from declining rainfall and consequent increase in severity and intensity of bushfires. The taxon may

be sensitive to fire frequency, as the more common *S. biflorus* was significantly lower in frequency in the year after fire (Walsh and McDougall 2004). The occurrence of *S. fasciculatus* was always too low to detect a trend, but it may also be adversely impacted by increased fire frequency.

Grazing by ungulates may be a threat, as *S. biflorus* made up more than 5% of cattle diet on any one collection day (van Rees 1984). Cattle and feral horses are present in the eastern part of the taxon's range, and deer are ubiquitous. The genus is only grazed by hares to a small extent (Green et al 2013).

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 90 years is inferred to be 10 to 40%, based on (c) and (e) above.

The taxon's grassy woodland habitat was the preferred sub-alpine grazing habitat for cattle, which roamed across the alps in high numbers after European settlement. Along with an increased frequency of fire, this makes it likely that population numbers are now lower than they were a century ago, although the decline is difficult to quantify.

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 Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 17,235 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented considering its limited dispersal ability, the barriers to dispersal, and the lack of habitat separating individuals.

It is estimated to have 5 locations, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the defined threats, such as disturbance, weed invasion, declining rainfall, and an increase in severity and intensity of bushfires. Marginal populations at lower elevations are at most risk.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 174 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 5 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 10,000 to 30,000 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:

Eligible under criterion D as Vulnerable

The taxon is suspected to be very restricted.

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

References

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