Threatened Species Assessment

Zieria cytisoides
Downy Zieria

Taxonomy

Zieria cytisoides Sm.

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 A3ce+4ce; B2ab(iii,v)

Species Information

Description and Life History

The taxon is a bushy shrub to 3 m high; branches velvety with stellate hairs, not warted, often somewhat grapefruit-scented when crushed. Leaves trifoliolate; leaflets ovate to obovate, 9-42 mm long, 4-10 mm wide, apex acute to rounded, upper surface dark green and pubescent, lower surface grey-green and velvety, margins entire, not or hardly recurved; petiole 3-11 mm long. Inflorescence usually longer than leaves, 3-30-flowered. Sepals triangular, c. 3 mm long, tomentose, smooth; petals 3-5.5 mm long, deep to pale pink, rarely white, valvate, pubescent; ovary glabrous. Follicles velvety, lacking appendage; seed 2.5-3.5 mm long, black to red-brown, striated. Flowers winter and spring (VicFlora 2020)

The Vital Attributes database for congeneric taxa notes that they do not resprout post-fire, have a long-lived seed bank with complete germination after fire, the time to reproductive maturity is 5-10 years, and they have a long-lived seed bank up to 20-50 years (DELWP 2015)

Generation Length

The generation length of *Zieria cytisoides* is estimated to be 35 to 70 years. The taxon is likely to recruit prolifically from a persistent soil-stored seedbank following intense bushfires at pre-settlement intervals of 35-70 years or more, with sporadic recruitment in response to localised site disturbance events. The taxon is likely to persist in the seedbank even after each cohort has died.

Distribution

The taxon occurs in eastern Victoria, south of Dividing Range, extending discontinuously from the Glenmaggie district east to the NSW border and from the Suggan Buggan district to the Howe Range (VicFlora 2020).

Habitat

The taxon occurs in open eucalypt forest, woodland, heath, and riparian shrubland, on rocky and sandy substrates (VicFlora 2020).

Threats

The taxon is potentially threatened by increased fire extent and frequency combined with climatic warming and drying, which increases the risk of recruitment failure due to repeat fires and drought stress. The taxon is likely to

be at particular risk of adult mortality and recruitment failure in response to extreme and extended drought events, noting that it often occupies shallow skeletal soils or free-draining sandy soils.

The taxon may also be threatened by targeted browsing by Sambar Deer (*Rusa unicolor*) and feral horses, particularly during early stages of post-fire recruitment. This risk has a precedent in the region where Sambar have targeted another member of the Rutaceae, the Yellow-wood *Acronychia oblongifolia* (Bilney 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 A3 as Endangered

The population reduction over the next 100 years is projected to be 30 to 60% (midpoint 45%), based on (c) and (e) above. This is based on the projected impact of the identified threats.

Eligible under Criterion A4 as Endangered

The population reduction over any 105 to 210 year period, including both past and future (up to 100 years in the future), is estimated to be 35 to 75% (midpoint 50%), based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

Some historic decline may have occurred in the Glenmaggie and Suggan Buggan districts through habitat loss to marginal agricultural activities.

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 12,800 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the regional and landscape scales with seed dispersal largely at the metre scale by ants (myrmecochory).

It is estimated to have 3 locations, and has a continuing decline in (iii) and (v) above based on the impacts of the identified threats, such as increased fire, climatic warming and drying, drought events, and targeted browsing by Sambar Deer.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 99 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 3 locations, 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

No reliable estimate of the total population size for the taxon is available.

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

Bilney, R. (2013). Antler rubbing of Yellow-wood by Sambar in East Gippsland, Victoria. *Victorian Naturalist* 130:68-74.

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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

VicFlora (2020). Flora of Victoria, Royal Botanic Gardens Victoria: *Zieria cytisoides*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/cc0f0a5e-af22-446f-b36b-abfb448e9325