

Threatened Species Assessment

Hovea asperifolia subsp. *spinosissima* Rough Hovea

Taxonomy

Hovea asperifolia subsp. *spinosissima* I. Thomps.

H. asperifolia was previously included in *H. pannosa*. It can be distinguished from that taxon by its shorter, less spreading indumentum, shorter stipules and calyx, and leaves that are typically scabrous on the upper surface (VicFlora 2016).

H. asperifolia subsp. *spinosissima* is generally distinguished from *H. asperifolia* subsp. *asperifolia* by the linear, strongly revolute leaves with long, simple or forked projections and long simple hairs (at least on the midrib) on the upper surface, and the flowers that lack a yellow flare at the base of the standard (VicFlora 2016).

Current conservation status

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

Proposed conservation status

Critically Endangered in Australia

Criteria B1ab(iii)+2ab(iii)

Species Information

Description and Life History

The taxon is a shrub to 3 m high, usually erect; branchlets somewhat tomentose with curled to straight, ± appressed, brown hairs. Leaves mostly linear, 3-6 cm long, 2.5-4.5 mm wide; apex truncate to subacute, sometimes with a short mucro; upper surface strongly arched up either side of midrib, with sparse to scattered hairs on midrib, occasionally also on lamina, scabrous, stiff projections relatively long (c. 0.5 mm long), simple or forked; lower surface with moderate cover of coiled to crumpled hairs, often overtopped by longer white hairs; margins recurved to revolute, sometimes largely concealing lower surface; stipules ovate to lanceolate, 0.5-2 mm long, usually densely hairy. Inflorescence sessile, 2-flowered, rarely 3-flowered; pedicle 1-2 (-4) mm long; bract and bracteoles hairy, neither exceeding 2.4 mm long; bract inserted up to 2 mm below bracteoles, ovate to lanceolate, sometimes orbicular, 1-2.4 mm long; bracteoles ovate to lanceolate, 1.5-2.4 mm long; calyx 3-5 (-5.5) mm long; corolla pale to deep mauve; standard 7-10 mm long (including claw), usually wider than long, mauve with a deep purple basal flare, base cordate; keels shorter than wings; stamen-filaments to c. 5 mm long. Pods sessile, with moderate to dense cover of whitish to golden indumentum. The taxon flowers from August to September (VicFlora 2016).

Generation Length

The generation length of *Hovea asperifolia* subsp. *spinosissima* is estimated to be 45 to 75 years. This is based on a plausible longevity of 30-40 years. It is inferred that the taxon has predominantly episodic recruitment from a long-persistent, soil-stored seedbank following intense fire. The estimated pre-settlement fire interval is 45-75 years. The taxon is likely to be a fire-sensitive, obligate seed regenerator with little or no capacity for post-fire resprouting and no evidence to suggest root suckering.

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Distribution

The taxon occurs at two disjunct localities in the Midlands region of Victoria. The first is on the banks of Sailor's Creek near Daylesford, 100 km north-west of Melbourne, and the second is at the summit of the granitic Garden Range near Euroa, 150 km north-northeast of Melbourne (Thompson 2001; VicFlora 2016).

Habitat

The habitat of the Sailor's Creek occurrence is described as riparian forest on gravelly, orange, clay loam; open sclerophyll forest on steep rocky slopes; or very steep, boulder-strewn cliffs on salty Ordovician marine sediments. It is associated with *Eucalyptus macrorrhyncha* (Red Stringybark), *E. goniocalyx* (Long-leaved Box), *E. dives* (Broad-leaved Peppermint), *E. viminalis* (Manna Gum), *Acacia dealbata* (Silver Wattle), *A. melanoxylon* (Blackwood), *Leucopogon fletcheri* (Twin-flower Beard Heath), *Bursaria spinosa* (Sweet Bursaria), *Senecio phelleus* (Stony Fireweed), *Olearia erubescens* (Moth Daisy-bush), *Bossiaea buxifolia* (Matted Bossiaea), *Tetradlea ciliate* (Pink Bells), *Xerochrysum viscosum* (Shiny Everlasting), *Veronica perfoliate* (Digger's Speedwell), *Lomandra filiformis* (Wattle Mat-rush), *L. longifolia* (Spiny-headed Mat-rush), *Dianella admixta* (Black-anther Flax-lily), *Stellaria pungens* (Prickly Starwort), *Anthoxanthum odoratum* (Sweet Vernal-grass), *Brachyscome diversifolia* (Tall Daisy), *Chrysocephalum semipapposum* (Clustered Everlasting), *Brunonia australis* (Blue Pincushion), *Hovea linearis* (Common Hovea) and *Poa sieberiana* (Grey Tussock-grass).

The habitat of the Garden Range occurrence is described as dry sclerophyll forest of *Eucalyptus blakelyi* (Blakey's Red Gum), Long-leaved Box, Red Stringybark, *Grevillea alpine* (Cat's Claw Grevillea), *Stypandra glauca* (Nodding Blue-lily), *Calytrix tetragona* (Common Fringe-myrtle) and *Brachyloma daphnoides* (Daphne Heath), where it grows among rocks on the summit of the west peak.

Threats

The taxon is threatened by factors that affect small populations, as well as its extreme geographic restriction and isolation. As a result, it is particularly susceptible to stochastic events such as landslip, substrate collapse or plague locusts. Plague locusts have moved through the Daylesford district in large numbers in recent years, and have stripped all foliage off shrubs.

The taxon is also threatened by exotic herbivores, including goats and, potentially, rabbits, which particularly threaten recruiting stands. The taxon may also be at risk in the longer term from climatic drying and warming, with increasing frequency and intensity of extreme drought events resulting in adult mortality and recruitment failure. There is also a low risk from too frequent fire, although the habitat is too dry to support fire at intervals below 10 years.

Both occurrences on Sailor's Creek near Daylesford have not been burnt for at least 35 years, and potentially much longer. The habitat of the occurrence on the summit of Garden Range near Euroa has not been burnt for a least 120 years (Phil Hawkey, Euroa Vegetation Management Officer, pers. comm. to Dale Tonkinson 15 March 2019).

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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%
<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>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.</p> <p>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]</p> <p>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.</p> <p style="text-align: center;"><i>based on any of the following:</i></p> <ul style="list-style-type: none"> (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.

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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 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 Criteria B1 and B2 as Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 8 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA), and also on the available records from field work.

The Area of Occupancy (AoO) across the taxon's range is estimated to be 8 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA

Two locations can be identified for the Daylesford and Garden Range occurrences, since each is subject to stochastic threats which may operate independently at each site.

The taxon is severely fragmented naturally at the regional and landscape scales. It is unclear whether the taxon is also severely fragmented anthropogenically at the landscape scale. Geographically isolated stands occur at separations typically exceeding the dispersal range of the taxon, which has no specialised mechanism for long-distance dispersal. This precludes the possibility of recolonisation in the event of local extinction.

It has a continuing decline in (iii) above, based on the likely impacts of the identified threats.

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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 60 to 150 mature individuals, but other thresholds under this criterion have not been met.

Criterion D. Very small or restricted populations				
		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 km ² or number of locations ≤ 5

Evidence:

Eligible under Criterion D as Endangered

The taxon is estimated to have 60 to 150 mature individuals. The current population estimate is based on a minimum of 60 plants recorded at Sailor's Creek south of Bryce's Flat, south-west of Hepburn Springs, and a highly localised occurrence at The Blowhole on Sailor's Creek, west of Hepburn. It is also based on an assumption that the Garden Range occurrence is small.

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



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References

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

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Thompson, I.R. (2001). Morphometric analysis and revision of eastern Australian *Hovea* (Brongniartieae - Fabaceae). *Australian Systematic Botany*, 14 (1), 1-99.

VicFlora (2016). Flora of Victoria, Royal Botanic Gardens Victoria: *Hovea asperifolia* subsp. *spinosissima*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/242610ce-52c6-4445-9b75-77c46a0f6ec5>