

Bossiaea rosmarinifolia Grampians Bossiaea

Taxonomy

Bossiaea rosmarinifolia Lindl.

Current conservation status

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

Proposed conservation status

Endangered in Australia

Criteria B1ab(iii)+2ab(iii)

Species Information

Description and Life History

The taxon is an erect or spreading shrub to 2.5 m high; stems terete, glabrous to densely appressed- or spreading-pubescent. Leaves alternate or opposite, unifoliolate; petiole distinct, to 1.5 mm long, often with slender spur to 1 mm long; lamina linear or linear-lanceolate, 10-28 mm long, 1-3 mm wide, rounded basally; apex acuminate or pungent; upper surface dark green, usually glabrous; lower surface paler, glabrous to densely pubescent; stipules setaceous, to 3 mm long, spreading to reflexed, persistent. Flowers solitary, or occasionally paired, 7-12 mm long; pedicels filiform, 6-8 mm long; bracts crowded, less than 1 mm long; bracteoles c. 1 mm long, inserted at or above middle of pedicel, persistent; calyx 3-5 mm long, ± glabrous, tube longer than lobes; upper lobes much broader than the lower; standard mainly red externally and golden-yellow internally; ovary stipitate, ± glabrous, 3-4-ovulate. Pod elliptic or obovate to oblong, 1-2 cm long; stipe about as long as or exceeding the calyx. The taxon flowers in May and from September to November (VicFlora 2020).

Generation Length

The generation length of *Bossiaea rosmarinifolia* is inferred to be 35 to 70 years. This is based on a plausible longevity of 25-40 years. It is also based on the likelihood that the taxon is an obligate seed regenerator, with recruitment largely pulsed by severe wildfire at a pre-settlement frequency arguably in the 35-70 year range.

Distribution

The taxon is endemic in the Grampians (VicFlora 2020). All reliable records suggest that the core habitat is concentrated from just north of Halls Gap south to Mafeking with apparent western outliers at Wallaby Rocks and, with some doubt, a quadrat record north-east of Mt Thackeray.

Habitat

Quadrat data do not fully support the Flora of Victoria statement that it 'occurs chiefly in tall open-forest' (VicFlora 2020), suggesting instead that the habitat range is largely centred on drier shorter stature forest, possibly extending to shrubland or open woodland in the driest rockiest sites, for example, on the Mt William range. Therefore, the taxon is not regarded as a habitat specialist but rather a generalist of patchy local occurrence.

Threats

Key threats to the taxon include the generic threat of a projected increase in fire frequency, intensity and size, as well as climatic warming and drying. These increase the risk of extreme drought stress, resulting in a high risk of recruitment failure and the progressive failure to adequately replenish soil-stored seedbanks. Recruiting stands are also at particular risk of recruitment failure from targeted browsing by native and exotic herbivores including deer and goats, noting that Sambar Deer (*Rusa unicolor*) are now actively and aggressively targeting a wide range of peas and other shrubs in the Grampians (Neil Marriott pers. comm. 18/12/18). The taxon is also potentially threatened by *Phytophthora cinnamomi* infection since most peas in the region are susceptible to it (Neil Marriott pers. comm. 18/12/18).

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>based on any of the following:</p>	<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>
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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 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 Criterion B1 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 344 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the landscape scale. The taxon has a patchy distribution with most occurrences isolated from other occurrences at separations greatly exceeding the localised dispersal range of the species, which has no known mechanism for long range dispersal

It is estimated to have 1 location. It has a continuing decline in (iii) above, based on a projected increase in fire frequency, intensity and landscape scale, as well as climatic warming and drying, all of which increase the risk of extreme drought stress. The habitat is also threatened by targeted browsing by native and exotic herbivores including deer and goats and, potentially, by *Phytophthora cinnamomi* infection.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 132 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it severely fragmented, has 1 location, and has a continuing decline in (iii) above.

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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 as Data Deficient

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

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 D2 as Vulnerable

The taxon is inferred to be very restricted.

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

References

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



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