



Bossiaea riparia River Leafless Bossiaea

Taxonomy

Bossiaea riparia A. Cunn. ex Benth.

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 A2bce+3ce+4bce; B2ab(iii,v)

Species Information

Description and Life History

The taxon is an erect or decumbent shrub to 1 m high, \pm glabrous; stems rigid, \pm terete, branches flattened, winged, ultimate branches of cladodes 2-4 mm wide. Leaves reduced to small scales c. 1 mm long. Flowers solitary or several together, 6-10 mm long; pedicels 2-4 mm long; bracts usually 5 or 6, to 1 mm long, persistent; bracteoles inserted near middle of pedicel, c. 1.5 mm long, persistent; calyx 3-4 mm long, glabrous; standard yellow, about as long as other petals; ovary shortly stipitate, glabrous, c. 4-ovulate. Pod narrow-oblong, to 2 cm long; stipe c. equal to calyx. The taxon flowers from September to November (VicFlora 2019).

Generation Length

The generation length of *Bossiaea riparia* is estimated to be 50 to 100 years. The longevity is likely to exceed 30 years and very plausibly exceeds 50 years. In the absence of fire, the longevity may be determined by mega-droughts which, on current evidence, occur at century scale intervals. The taxon is likely to be an obligate seed regenerator, but is likely to resprout successfully following intense browsing and low intensity fire. It should be noted that localised fire intensity is likely to be highly variable in rocky sites where many fires may only affect a proportion of adults, some of which may not be fire-killed and able to resprout successfully. Also, the taxon is often riparian, where additional moisture is likely to mitigate high intensity fire impact.

Distribution

The taxon is uncommon to rare in Victoria, occurring in the south-west, in the Grampians, and in eastern Victoria. The taxon also occurs in NSW and Tasmania (VicFlora 2019).

The taxon has a remarkably disjunct distribution, with almost all known occurrences being highly disjunct from all other occurrences. However, the Grampians is an exception to this, where several localised concentrations are recorded.

Habitat

The taxon grows on streambanks and in moist and dry situations in dry sclerophyll forest, often at fairly high altitudes (VicFlora 2019).

Threats

Plausible threats to the taxon include browsing, inappropriate fire regimes and drought stress, particularly during recruitment. These threats are all predicted to increase in frequency and intensity in response to climatic drying and warming, and the increasing range and local density of Sambar throughout the forested regions of the state.

The highly disjunct occurrences across the Victorian range of the taxon suggest that the current distribution may be relictual and that the taxon is subject to a long-term decline, independent of post-European settlement impacts. This is supported by the proportion of historic collections, suggesting that the taxon has already become locally extinct at a number of isolated sites.

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:

Eligible under Criterion A2 as Endangered

The population reduction over the past 150 to 300 years is suspected to be 30 to 80 (midpoint 50)%, based on (b), (c) and (e) above. The causes of the reduction may not have ceased, be understood or be reversible.

Past decline cannot be estimated with any confidence and could equally plausibly be less than 30% or greater than 80%. This is based on the apparent extinction at the site of historic records, the likely impact of the identified threats, and the possibility that the taxon has a relictual distribution and is undergoing long-term decline at the century or millennial scale. In addition, local extinction is difficult to demonstrate given that seedbanks are likely to persist in the absence of living plants over decades or even centuries.

Eligible under Criterion A3 as Endangered

The population reduction over the next 100 years is suspected to be 30 to 80 (midpoint 50)%, based on (c) and (e) above.

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Future decline cannot be estimated with any confidence and could equally plausibly be less than 30% or greater than 80%. This is based on the likely impact of the identified threats, and the possibility that the taxon has a relictual distribution and is undergoing long-term decline at the century or millennial scale. In addition, local extinction is difficult to demonstrate given that seedbanks are likely to persist in the absence of living plants over decades or even centuries.

Eligible under Criterion A4 as Endangered

The population reduction over any 150 to 300 year period, including both past and future (up to 100 years in the future), is suspected to be 30 to 90 (interval 50)%, based on (b), (c) and (e) above. 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 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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 84 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented naturally at the regional and landscape scales. Geographically isolated stands occur at separations typically exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal. Additionally, the taxon is likely to be dispersed by ants (myrmecochory) at the metre scale. This precludes the possibility of recolonisation in the event of local extinction.

It is estimated to have a continuing decline in (iii) and (v) above, based on the current and projected impact of the identified threats, including browsing by Sambar, inappropriate fire regimes, drought stress, and climatic drying and warming.

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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 100 to 1,000 (midpoint 400) 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 Vulnerable

It is estimated that there are 100 to 1,000 (midpoint 400) individuals

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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