

Asterolasia phebalioides Downy Star-Bush

Taxonomy

Asterolasia phebalioides F. Muell.

Current conservation status

Listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*.

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1996).

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

Proposed conservation status

Vulnerable in Victoria

Criteria A2bc+3bce; B1ab(i,ii,iii,v)+2ab(i,ii,iii,v); D2

Species Information

Description and Life History

The taxon is an open or compact shrub to 1 m high, overall grey to brown stellate-tomentose. Leaves densely crowded on short branches, cuneate-obcordate, 5-10 mm long, 2-4(-6) mm wide, often partly or strongly folded, apex obcordate or obtuse. Flowers terminal, solitary, sessile, closely subtended by 5 leafy bracts; sepals rudimentary or lacking; petals elliptic or obovate, 6-10 mm long, bright golden yellow, finely stellate outside; stigma deeply cleft into 5 spreading, linear lobes. Follicles glabrous, not beaked, c. 3.5 mm long. The taxon flowers in spring (VicFlora 2019).

Generation Length

The generation length of *Asterolasia phebalioides* is estimated to be 20 to 40 years. This is based on a longevity of plausibly 60 years, a pre-settlement fire interval plausibly in the 20-40 year range and the likelihood that episodic fire-induced mass recruitment greatly exceeds the proportion of recruitment responding continuously to small scale soil disturbances.

Distribution

In Victoria, the taxon occurs in the Grampians National Park, Black Range State Park (and a few surrounding roadsides), and the Nurcoung area. A small population also occurs on private land adjacent to the northern edge of Little Desert National Park, south-east of Nhill. The taxon also occurs in SA (Carter 2010; VicFlora 2019).

Habitat

The taxon occurs in open woodland, forest and heath on sandstone and sandy soils (VicFlora 2019).

Threats

The major threats to the taxon, as identified by Carter (2010), are disturbance and *Phytophthora cinnamomi*. This taxon has been shown to be susceptible to infection leading to plant death in seedling stages by *Phytophthora*. This pathogen has been recorded in some of the areas this taxon occurs. Weed invasion and browsing may also represent minor threats to this taxon. A predicted fire interval of about 25 years is required for plants to recruit, with

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plants requiring a minimum of 6 years to set seed following fire. Roadside populations have been observed to recruit following track maintenance in the absence of fire. However, too frequent clearing of roadsides may threaten this taxon.

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 Vulnerable

The population reduction over the past 60 to 120 years is estimated to be 20 to 40%, based on (b) and (c) above.

Past decline is based on the loss of potential habitat immediately north and west of the Grampians.

Eligible under Criterion A3 as Vulnerable

The population reduction over the next 60 to 100 years is projected to be 20 to 30%, based on (b), (c) and (e) above.

Future decline is based on the likely effects of altered disturbance frequency and soil pathogens on recruitment of this taxon.

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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 Criterion B1 as Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 4,237 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

It is suspected to have six locations, based on the range of threats and the varying landscapes and management regimes.

. It has a continuing decline in (i), (ii), (iii) and (v) above, based on the current and projected impact of the identified threats, including disturbance due to land management practices and the potential for increased fire frequency.

Eligible under Criterion B2 as Vulnerable

The Area of Occupancy (AoO) across the taxon's range is estimated to be 104 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it has 6 locations and has a continuing decline in (i), (ii), (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	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				

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Evidence:

Ineligible under Criterion C

It is estimated that there are 5,000 to 10,000 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 5,000 to 10,000 individuals, and 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

Carter, O. (2010). *National Recovery Plan for the Downy Star-Bush Asterolasia phebalioides*. Department of Sustainability and Environment, Melbourne.

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

SAC (1996). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 366 *Asterolasia phebalioides*.

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Asterolasia phebalioides*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/abea5ae0-75bf-4d53-afcb-816f9939273f>