Threatened Species Assessment

Asterolasia asteriscophora subsp. *albiflora*
White Star-bush

Taxonomy

Asterolasia asteriscophora subsp. *albiflora* B.J. Mole

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* SAC 2001).

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

Proposed conservation status

Critically Endangered in Australia

Criteria A2abce+4bce; B1ab(i,ii,iii,v)

Species Information

Description and Life History

The White Star-bush, also known as the Emerald Star-bush, is a slender upright shrub growing to 1.5 metres tall with dark green obovate to almost circular leaves, reaching 30 x 10 mm in size. The upper surface of the leaves have a few stellate hairs, while the lower surface is densely covered with rusty coloured stellate hairs. The flowers are usually white (occasionally pale lemon), star-shaped with 5 petals and 10 showy protruding stamens, often alternating long and short. The sepals are reduced to scales at the base of petals. The flowers are borne in umbels of 3 to 5, on stalks (pedicels) 6 to 15 mm long which are supported on a common stalk (peduncle), which is up to 5 mm long. White Star-bush typically flowers from early October to late November (DSE 2015). Plants will flower as early as their second year so a mature individual can be as young as 4-5 years old.

Generation Length

The generation length of *Asterolasia asteriscophora* subsp. *albiflora* is estimated to be 10 to 60 (midpoint 45) years. This is based on the taxon's life-form (medium shrub). Ten is a reasonable minimum, Habitats would have tolerable fire intervals (TFIs) considerably more than 30 years, possibly 60-90. Some plants may emerge in response to animal activity, otherwise the seedbank is likely to persist until the next fire.

Distribution

The taxon is endemic to Victoria, and is only known from the Dandenong Ranges from Belgrave, Monbulk, Emerald and Avonsleigh.

Habitat

The taxon occurs in damp sclerophyll forest at foothills approximately at 150-300 m altitude.

Threats

The taxon occurs in an urbanised area of Melbourne where housing and development are major threats as is the changed fire regime. Fire is necessary for significant recruitment from seed. a sequence of short interval fires may lead to a bracken-dominated environment. Reduced fires may introduce weed species, animals and plant diseases are also likely to threaten this taxon. For example, Rutaceae are selectively damaged by deer, mostly Sambar

(*Rusa unicolor)* and many taxa in this family are known to be susceptible to damage by Cinnamon Fungus (*Phytophthora cinnamomi)*.

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 A2 as Critically Endangered

The population reduction over the past 30 to 180 years is inferred to be 50 to 85%, based on (a), (b), (c) and (e) above.

The past decline is inferred from the degree of land clearing in this area over the past 180 years. Most losses will have occurred in the last 80-90 years. The population size is likely to have at least halved, but potentially a lot more than that has been lost due to loss of habitat.

The causes of the reduction may not have ceased, be understood or be reversible.

Eligible under Criterion A3 as Endangered

The population reduction over the next 30 to 100 years is projected to be 33 to 65%, based on (c) and (e) above.

Many populations are in reserves and hence unlikely to be lost to development. However, plants outside the reserves are likely to be lost due to road upgrades and continued development of this area. Threat of deer establishing in these reserves may lead to a large reduction in plant numbers in reserves. There is no evidence of deer at Emerald Quarry as of 2020 but it a feasible threat.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 30 to 180 year period, including both past and future (up to 100 years in the future), is estimated to be 33 to 85%, based on (b), (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

The past decline is inferred from land clearing in this area over the past 90 years. Future decline is likely as plants outside the reserves are likely to be lost due to road upgrades and continued development of this area.

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 Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 60 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented, as all plants are in the one area, with little chance of recolonisation once bushland is developed for housing.

It is estimated to have one location. It has a continuing decline in (i), (ii), (iii) and (v) above, based on areas of future development and loss of habitat.

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 2,000 to 6,000 (midpoint 3,500) mature individuals, but other thresholds under this criterion have not been met.

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 D 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

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

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SAC (2001). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 541 *Asterolasia asteriscophora* subsp.*albiflora*.

VicFlora (2015). Flora of Victoria, Royal Botanic Gardens Victoria: *Asterolasia asteriscophora* subsp. *albiflora.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/a4ad85fc-869c-472b-83af-40dfeb54b10d