

Allocasuarina nana Stunted Sheoak

Taxonomy

Allocasuarina nana (Sieber ex Spreng.) L.A.S. Johnson

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 B1ab(iii)+2ab(iii)

Species Information

Description and Life History

The taxon is a long-lived dioecious (rarely monoecious) shrub to 2 m high. Resprouting after fire with recruitment more or less confined to the immediate post-fire period after liberation of the canopy-stored seed (from female plants only). Pollination (pollen borne on male plants) is by wind. The female cones take some months to ripen and accumulate to form a large canopy-stored seedbank. The longevity of individual cones probably exceeds 10 years. The cones liberate the seeds on the death and drying out the cones on the branches. The winged seeds are wind-dispersed over potentially large distances, hundreds of metres or more.

Generation Length

The generation length of *Allocasuarina nana* is estimated to be 30 to 50 years. This is based on a recurrent fire interval of a very long-lived taxon, with the taxon essentially recruiting only after fire.

Distribution

The taxon is confined in Victoria to a cluster of records in far East Gippsland near the NSW border. Other records (e.g. Mt. Cannibal and Mt. Elizabeth) are erroneous. The taxon also occurs in central NSW and south to Victoria.

Habitat

The taxon occurs on exposed sandstone ridges and plateaus on well drained often stony podzol soils and often rocky habitats. The taxon occurs around 300-500 metres above sea level. The taxon typically forms closed heath, sometimes with scattered Eucalyptus emergents or a closed shrubland within an open Eucalypt forest.

Threats

Threats to the taxon include climate change (i.e. decreased rainfall, increased evaporation, extreme temperatures), increased frequency and intensity of fire, impacts of fire control activities, soil loss on bare post-fire substrates resulting from severe rainfall events, weed invasion, and Cinnamon Root-rot Fungus *Phytophthora cinnamomi*. It may potentially be impacted by browsing of resprouts or recruits by Sambar Deer (*Rusa unicorn*).

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> <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.

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 62 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The main threats to the taxon (i.e. fire, climatic drying and warming, habitat loss and fragmentation, weed invasion, fungal pathogens and extreme drought stress) have a non-reversible impact on the individuals of the taxon and occur in a stochastic manner, and have the potential over time to threaten the majority of individuals in the geographic area. There is considered to be two such areas, so there is considered to be two locations.

It has a continuing decline in (iii) above, based on the current and projected impact of the identified threats, including the increasing risk of extreme drought stress, repeat fires, and potentially browsing of resprouts or recruits by Sambar.

Eligible under Criterion B2 as Endangered

The Area of Occupancy across the taxon's range is estimated to be 20 km², based on 2 x 2 km² grids derived from accepted, post-1970 records from the VBA. As above, it is estimated to have 2 location and has a continuing decline in (iii) 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	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.

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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 km ² or number of locations < 5

Evidence:

Eligible under criterion D2 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.

VicFlora (2017) Flora of Victoria, Royal Botanic Gardens Victoria: *Allocasuarina nana*. Retrieved from <https://vicflora.rbg.vic.gov.au/flora/taxon/661234e8-ff40-435a-83fe-1f8fb792e4db>

Wilson, K.L., & Johnson, L.A.S. (1989). Casuarinaceae, In A.S. George (Ed.), *Flora of Australia Vol. 3* (pp. 100-174, 183-202).