Threatened Species Assessment

Acacia nanodealbata
Dwarf Silver-wattle

Taxonomy

Acacia nanodealbata J.H. Willis

Acacia nanodealbata differs from *A. dealbata* in having crowded (almost touching to overlapping), almost glabrous pinnules which are less than 2.5 mm long and have an obtuse apex. The pinnules of *Acacia dealbata* subsp. *alpina* are generally longer and less stout than those of *A. nanodealbata* (VicFlora 2017)

Current conservation status

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

Proposed conservation status

Vulnerable in Australia

Criterion A2bc+3c+4bc; B2ab(iii,v); D2

Species Information

Description and Life History

The taxon is an erect or spreading large shrub or small tree to 6 m tall, with feathery grey-green foliage, and pale yellow, globular, flower clusters, in racemes, arising from leaf axils. Bark dark brown, smooth, usually blotched with grey lichens. Leaves: Bipinnate, alternate along angled almost glabrous stems, oblong, 3-8 x 2-4 cm. Pinnae in 10-25 opposite pairs, oblong, 50 x 5 mm, each pair with a single gland at the base. Pinnules, in 20-40 opposite crowded-overlapping pairs, oblong to ovate, blunt, 2 x 1 mm, glabrous or sparsely hairy mainly near the margin. Flowers: Clustered in globular, bright yellow heads, to 1 cm wide, in loose, axillary panicles (Jul Aug Sep Oct Nov). Fruit: An oblong pod to 7 x 1.5 cm, not constricted between seeds. Seeds 5-10, dark brown shiny ovoid, 4-5 mm long; funicle pale brown and shorter than seed (VicFlora 2017).

It should be noted that while some subpopulations are suspected of root suckering, it is assumed that the majority of occurrences behave as fire-sensitive obligate seed regenerators.

Generation Length

The generation length of *Acacia nanodealbata* is estimated to be 50 to 80 years. This is based on a longevity plausibly in the 50-120 year range. It is also based on recruitment typically cued by fires at mean pre-settlement frequencies ranging from 40-250 years, depending on rainfall and landscape context.

Distribution

The taxon is known from forests in the Healesville-Warburton area, the top of Mt Macedon, near Creswick, and in the Otway Range (VicFlora 2017).

Habitat

The taxon is typically associated with wetter forests, low to moderate elevations (170 to 666 m) and the annual rainfall ranges from 782 to 1386 mm.

Threats

All populations are at long-term risk from repeat fire events at frequencies below the tolerable fire interval for the taxon. Modelling of the capacity of related *Acacia* species in the Central Highlands of Victoria to persist in the face of climate change suggests that all species will be subject to dramatic declines in their capacity to recruit from seed at all except the highest elevations in the region with the greatest change in recruitment success occurring between 2045 and 2055 with negligible capacity to recruit successfully by 2085 (Nitschke & Hickey 2007).

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 Vulnerable

The population reduction over the past 150 to 240 years is inferred to be 30 to 45%, based on (b) and (c) above.

Past decline is based on landscape context where the majority of subpopulations occur within public land and only a smaller proportion occur on the margins of public land and within alienated agricultural landscapes.

Eligible under Criterion A3 as Vulnerable

The population reduction over the next 100 years is projected to be 15 to 40%, based on (c) above.

All populations are at long-term risk from repeat fire events at frequencies below the tolerable fire interval for the taxon.

Eligible under Criterion A4 as Vulnerable

The population reduction over any 150 to 240 year period, including both past and future (up to 100 years in the future), is estimated to be 45%, based on (b) and (c) above.

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 B2 as Vulnerable

The Area of Occupancy (AoO) across the taxon's range is estimated to be 408 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

There is suspected to be eight to ten locations, based on distinct climatic and landscape contexts in the Central Highlands, north-central districts and the northern and western Otways. There is potentially a further location for the western outlier at the Ralph Illidge Sanctuary, Naringal East (32km E from Warrnambool). The primary threat of increased fire could impact several locations at once, but not all.

It is estimated to have a continuing decline in (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	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 1,000 to 5,000 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

It is estimated that there are 1,000 to 5,000 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

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

Nitschke, C.R., and Hickey,G.M. (2007). Assessing the Vulnerability of VIctoria's Central Highlands Forests to Climate Change. Technical report.

VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Acacia nanodealbata*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/86490866-14b5-4670-91f8-5ee0f1f78fd1