Threatened Species Assessment

Acacia binervia
Coast Myall

Taxonomy

Acacia binervia (J.C. Wendl.) J.F. Macbr.

Current conservation status

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

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

Proposed conservation status

Critically Endangered in Victoria

Criteria A3ce+4ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C1+2a(i,ii); D

Species Information

Description and Life History

Tree, to 16 m high; bark furrowed and fibrous. Phyllodes elliptic to narrowly elliptic, 4-8 cm long, 11-18 mm wide, straight or falcate, flat, acute or with hooked, knob-like mucro, glaucous; 3 veins prominent with numerous longitudinal secondary veins, none reticulate, covered with fine, white-grey appressed hairs; gland small, basal. Spikes 1-several per axil, 2-6 cm long, pale to mid yellow, often on short axillary shoot; rachis densely pubescent, often growing out into a phyllodinous shoot; peduncle to 5 mm long; flowers 5-merous, dense; sepals united, often woolly. Pods narrow-linear, 5-8 cm long, 3-5 mm wide. The only Victorian specimen was in bud in May (VicFlora 2018).

The taxon is assumed to be an obligate seed regenerator with no capacity to sucker from the root system or resprout following intense fire. The taxon is reported to be particularly thin barked, supporting the inference that it is highly fire-sensitive.

Generation Length

The generation length of *Acacia binervia* is estimated to be 70 to 100 years. This is based on a plausible longevity of 60-70 years and an inferred episodic recruitment in response to flood and fire events at pre-settlement intervals of 80-100 years or more. The habitat is highly xeric and exceedingly drought stressed between major flood events.

Distribution

The taxon is known in Victoria by a single mature individual located on the west bank of the Snowy River 6.5 km south-east of Mountain Hut Peak in the Suggan Buggan district in the Upper Snowy River area, near the NSW border in far East Gippsland. The site is about 9 km ESE of Suggan Buggan and 4.5 km in a direct line SE of the junction of Sandy Creek and the Snowy River.

Habitat

The only known Victorian occurrence was reported in 1989 to be growing in sand at the upper flood level at the edge of the flood plain on the west bank of the Snowy River, approximately 100 m west of the river channel.

Monitoring of the site in 2004 described the habitat as a rocky outcrop, on the upper river terrace 50 m from the Snowy River. The vegetation is rain shadow woodland dominated by *Brachychion populneus* (Kurrajong), *Callitris*

columellaris (White Cypress-pine) and *Eucalyptus melliodora* (Yellow Box). The taxon is associated with four other species of *Acacia* - *A. boormani*i subsp. *boormanii* (Snowy River Wattle), *A. dealbata* (Silver Wattle), *A. deane*i subsp. *paucijuga* (Deane's Wattle) and *A. mearnsi*i (Black Wattle).

The localised outcrop is reported to be granitic, in contrast to the Snowy River Volcanic rhyodacite geology elsewhere in the Suggan Buggan district.

Threats

The taxon is represented in Victoria by a single adult individual which was reported to be a small tree 3 m tall in 1989. When monitored in 2002, the plant had grown to 6 m tall but no seedlings were observed at the site. A dead eucalypt nearby was considered a potential threat but no other obvious threats could be identified. The tree was described as healthy, vigorous and at the prime of life. The consistent lack of seedling recruits is likely to be due to chronic browsing pressure from goats, wallabies, kangaroos, rabbits, feral horses and Sambar, all of which are active throughout the area.

The taxon may be dispersed into Victoria by floodwaters carrying seed from populations upstream in NSW.

Monitoring in 2004 noted that the tree and its habitat were unaffected by the 2003 wildfires which swept through the Alpine region.

Fire is not considered a major threat given the low biomass and rocky habitat. However, the taxon has particularly thin bark and is inferred to be highly fire-sensitive and adult individuals are likely to be killed by scorching of the bark by radiant heat even if the canopy were not directly consumed by a passing fire.

Anthropogenic and climate-related modification of the prevailing flood regime is not considered a major threat since flood-mediated recolonisation from upstream sources in NSW. If it occurs, it is likely to remain a rare but reliable event.

Threats are further discussed by FFG Nom. (2003) as follows:

The Victorian population of Coast Myall is threatened principally by its apparent restriction to a single mature individual, placing the species at the extreme limit of all the geographic and demographic parameters used to assess conservation status. Thus the linear geographic range, extent of occurrence, area of occupancy, population size and the number of subpopulations are all vanishingly small. Furthermore, the Victorian occurrence is presumably at least 10 km from the closest occurrence in New South Wales. The population in this cross-border district, of which the Victorian plant represents an isolated subpopulation at the geographic limit of the species' range, is therefore severely fragmented.

In June 2002, Judy Downe (DSE Heidelberg) monitored the plant and noted that it was healthy, vigorous and at the prime of its life. Whereas Turner and Eichler's collector's notes record that the plant was 3 m tall in 1989, Downe noted that it was now 6 m tall in 2002. Significantly, Downe also noted that there was no evidence of seedling recruitment and that the specimen may be physically threatened by the collapse of a dead eucalypt nearby. Equally significant is the observation by Eichler (pers. comm.) that, whilst the plant is noted to have flowered in recent years, there is no evidence that it has set seed.

Although no other threats were evident at the time, in the absence of vegetative or seedling recruitment, the single mature tree is at great risk from fire. There is an urgent need to monitor the fate of this specimen following the catastrophic wildfire which swept through the district in January 2003. It is particularly noteworthy in this regard that Elliot and Jones (1982) observe that the species (listed on page 55 under the synonym *Acacia glaucescens*) "has one of the thinnest barks known." This feature alone would render this species uniquely vulnerable to destruction by scorching of the bark by radiant heat even if the canopy were not directly consumed by a passing fire.

The observed failure to recruit in the absence of fire may be due to reliance on a seed scarifying event such as fire, flood, frost, extremes of drought and ambient temperatures or predation by frugivores and other seed dispersers such as ants. Such an episodic regeneration strategy would be consistent with the synchronised pulse regeneration in response to rare germination events observed in related Myall species in inland regions of the Australian mainland. Alternatively, the observed failure to recruit may be a direct consequence of grazing pressure by rabbits, hares, macropods, stock, feral horses (brumbies) and deer, all of which have been observed in considerable numbers in the area despite its dedication as national park. In any case, if seed coat dormancy were

broken by any of these events, the grazing pressure from rabbits, in particular, is likely to eliminate successful germinants, especially in a post-fire recovery period when other sources of forage have been eliminated.

It is unclear whether the vanishing rarity of this species in Victoria represents the tail end of a more extensive population which has been depleted to the verge of local extinction with the advent of rabbits, stock grazing, brumbies and modified fire regimes or whether the single occurrence is simply a vagrant which may have been introduced by floodwaters from more extensive stands in the headwaters of the Snowy River. With the modification of flow regimes following the construction of the Snowy Mountains Hydro-electric Scheme, such vagrant flood-mediated dispersal events may also have become a vanishingly rare event.

Finally, this species has a reputation as a stock poison (Tindale and Kodela 2001). Young shoots in particular are toxic to livestock (Elliot and Jones 1982). In fact, Lord and Willis (1982) state that *Acacia glaucescens* Coastal Myall is "a beautiful tree but its leaves are poisonous to cattle; this wattle and *A. georginae* (inland areas) are the only species known to have caused stock losses." There is a distinct possibility, therefore, that intentional culling of this distinctive glaucous species, for the protection of stock, by over-zealous graziers and brumby runners, both of whom were very active throughout the Upper Snowy district over a number of generations, may have contributed to the demise of the species.

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 A3 as Critically Endangered

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

This is based on the high risk of local extinction of the only known occurrence through mortality of the only known mature individual and the observed lack of seedling recruitment at the site.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 210 to 300 year period, including both past and future (up to 100 years in the future), is estimated to be 100%, based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

There is no evidence to indicate whether the taxon has suffered a significant historic decline.

Future decline of 100% is based on the high risk of local extinction of the only known occurrence through mortality of the only known mature individual and the observed lack of seedling recruitment at the site.

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

The taxon is estimated to have one location, as the single individual is subject to serious threats.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above. This is based on the high risk of local extinction of the only known occurrence through mortality of the only known mature individual and the observed lack of seedling recruitment at the site.

Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 4 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, the taxon has one location and has a continuing decline in (i), (ii), (iii), (iv) 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:

Eligible under Criterion C1 as Critically Endangered

It is observed that there is one mature individual, based on repeated monitoring. A continuing decline of 100% is estimated to occur within one generation.

Eligible under Criterion C2 as Critically Endangered

As above, it is observed that there is 1 mature individual.

The number of mature individuals is estimated to continue to decline, the number of mature individuals in each subpopulation is 50 or fewer and the percentage of mature individuals in one subpopulation is 90-100 %.

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 Critically Endangered

The taxon is observed to have 1 mature individual.

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.

SAC (2003). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 667 *Acacia binervia.*

Vic Flora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Acacia binervia*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/57030e5e-5104-4983-8794-c7c8e6b39353