



Acacia trineura Three-nerve Wattle

Taxonomy

Acacia trineura F. Muell.

Current conservation status

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

Proposed conservation status

Critically Endangered in Victoria

Criteria A3ce+4abce

Species Information

Description and Life History

The taxon is a rounded, fragrant shrub or small tree, 1-5 m high; branchlets slightly angular with resinous ridges, hoary. Phyllodes ascending, obovate to oblanceolate, 3-7 cm long, 4-11 mm wide, straight to slightly curved, thin-coriaceous, glabrous, obtuse with minute, callose apiculum; main veins 3, distinct, resinous, impressed in crests of low ridges, with several secondary veins and occasional anastomoses. Racemes 3-8-headed, rachis 5-7 mm long, minutely pubescent; peduncles 3-5 mm long; heads globular, 3.5-4.5 mm diam., c. 25-flowered, light to dark golden. Flowers 5-merous; sepals free. Pods linear, to 6 cm long, 2-4 mm wide, raised over and sometimes constricted between seeds, chartaceous, straight; seeds longitudinal, oblong, 4 mm long, glossy black, funicle-aril apical. The taxon flowers from August to November (VicFlora 2021).

Generation Length

The generation length of *Acacia trineura* is inferred to be 15 to 100 years, more likely 25-50 years. Rapid growth post-germination has been observed, hence the taxon is not long-lived for a woody shrub. The taxon germinates episodically after disturbance which usually consists of flooding but also fire, although fires are very rare in its habitat. It has rapid growth and flowering. It is not a long-lived shrub, with many dead by 15 years post-germination, and has a long-term soil seed store of at least 40 years. Although seed longevity is unknown, it is reasonable to hypothesize a half life of 25 years and a 10% longevity of around 50 years. The taxon is reported to sucker at, for example, Lake Boorooopki where well established as a self-propagating exotic, suggesting the taxon can extend its longevity through vegetative spread. An estimate of generation time is based on the plausible frequency of flood events under pre-European settlement conditions and is not influenced by longevity since most members of any cohort are likely to have died before the next flood or fire event. Generation time is likely to be highly dependent on flood intervals which vary significantly from sites with reliable flooding such as those on the Wimmera River between Dimboola and the Natimuk district contrasting with the northern limits at Pine Plains which are likely to have been subject to flooding at intervals of many decades only.

Distribution

The taxon is largely restricted in Victoria to the Wimmera River downstream of Dimboola, occasionally in non-riparian sites in the Wimmera region, and it formerly occurred on the Pine Plains in the northern Wyperfeld National Park. The Victorian distribution is markedly restricted, and it is disjunct from distribution in other states (notably NSW). Also South Australia and New South Wales (VicFlora 2021). The taxon extends upstream almost as far as



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the Natimuk district where recorded on the Polkemmet Road, as far north as Pine Plains, as far west as Boyeo north-west of Nhill and as far east as Yarriambiack Creek south of Warracknabeal.

The taxon was propagated at Wail Nursery for many decades and widely planted across the Wimmera as far east as Rupanyup. It has been used in Greening Australia seed mixes for revegetation in the West Wimmera and Hindmarsh Shires between the Big and Little Desert and is now an over-abundant nuisance, outcompeting other species in revegetation sites. This raises the possibility that some records may be planted or adventive. The taxon is recorded as both planted and naturalised at Lake Boorooopki east of Minimay in the south-western Wimmera where it reproduces by seed and suckering.

Habitat

The taxon is localised, sometimes near inland water, growing in red earths and clay (VicFlora 2021). It is largely restricted to the upper zones of riparian woodlands, with occasional records on heavier soils in the Wimmera Region, often forming near-pure monocultural stands with few other shrubs. Quadrat data suggests the taxon is closely associated with *Eucalyptus camaldulensis* (River Red-gum) and *E. largiflorens* (Black Box) woodland on heavy clay soils. Most sites are moderately weedy. The taxon appears to be strongly habitat-specific, dependent on recurrent flood events for successful episodic recruitment.

Threats

The greatest threat to the taxon, historically, currently and projected, is declining reliability of flooding through diversion of water in the Wimmera River for agriculture and town water supplies and, increasingly, through climatic drying. The broader landscape is heavily disturbed and alienated for intensive agriculture, particularly cropping. The riparian landscape has been subject to heavy stock grazing for over a century and water has been diverted for more than 90 years. With reliable and frequent flooding, the taxon would have been locally common 100 years ago. Notably, floods in 1956 and 1976 were a major contribution to population maintenance. All of the taxon's occurrences north of Lake Albacutya are declining towards extinction due to a lack of flooding. Past attempts to return environmental flows to the Wimmera River system have been notable failures and the political & social climates have not changed substantially. As it occupies the upper flood zone, occurrences further upstream are also threatened. The seed is large and poorly adapted for long-distance dispersal. The taxon is palatable to browsers and therefore suffers from rabbit, kangaroo and goat browsing, both inside and outside reserves. The taxon has undoubtedly suffered historic decline through habitat loss to agriculture in some districts and habitat degradation through livestock grazing and weed invasion. Quadrat data suggests that most sites are moderately weedy.

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 style="text-align: center;"><i>based on any of the following:</i></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:

Eligible under Criterion A2 as Endangered

The population reduction over the past 45 to 300 years is projected to be 50%, based on (a), (b) (c) and (e) above.

An estimate of past decline is based on the following factors. The broader landscape is heavily disturbed and alienated for intensive agriculture, particularly cropping. The riparian landscape has been subject to heavy stock grazing for over a century and water has been diverted for more than 90 years. With reliable and frequent flooding, the taxon would have been locally common 100 years ago. Notably, floods in 1956 and 1976 were a major contribution to population maintenance.

Eligible under Criterion A3 as Critically Endangered

The population reduction over the next 45 to 100 years is projected to be 50 to 90% (midpoint 70%), based on (c) and (e) above.

An estimate of future decline is based on the following factors. There is no prospect of returning reasonable environmental flows to the Wimmera River system downstream of Lake Hindmarsh, regardless of the effects of climate change. Furthermore, the adjoining agricultural landscape is almost completely alienated for intensive cropping. Records away from the Wimmera River system are largely the result of revegetation projects and therefore the habitat is only marginally suitable for this taxon. Whilst successful recruitment is reported at some of these sites, at others there is little or no prospect of reliable recruitment in the absence of recurrent flooding.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 45 to 300 year period, including both past and future (up to 100 years in the future), is observed to be 50 to 95% (midpoint 75%), based on (a), (b) (c) and (e) above.

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Past decline is based on the greater landscape having been heavily disturbed and alienated due to agriculture (i.e. crop growing), the riparian landscape having been subject to heavy stock grazing for over a century, as well as water having been diverted for over 90 years. With more frequent flooding, the taxon would have been locally common 100 years ago. Notably floods in 1956 and 1976 were a major boost to the population.

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

| 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 (EEO) | < 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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 6,374 km² and the Area of Occupancy (AoO) is estimated to be 120 km², but other thresholds under this criterion have not been met.

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| 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 suspected that there are 5,000 to 100,000 (midpoint 10,000) mature individuals, but this qualifier is too weak and 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:

Ineligible under Criterion D

It is suspected that there are 5,000 to 100,000 (midpoint 10,000) mature individuals.

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: *Acacia trineura*. Retrieved from <https://vicflora.rbg.vic.gov.au/flora/taxon/93fced9-e047-4ffe-9856-cedd150a94c8>