

## *Acacia daviesii* Timbertop Wattle

### Taxonomy

*Acacia daviesii* Bartolome

### Current conservation status

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

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

### Proposed conservation status

Critically Endangered in Australia

Criteria B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C2a(i); D

### Species Information

#### Description and Life History

The taxon is a shrub to 2.5 m high, root-suckering, stems erect, forming dense stands; branchlets usually pendulous, ribbed, shortly hispid, somewhat glandular. Phyllodes asymmetric, broadly elliptic to almost circular, 0.3-1.0 cm long, 2-8 mm wide, resinous, shortly stalked glandular hairs prominent on margins and veins, acute or obtuse, mucronate, margins undulate; veins 1 or 2, midrib usually more prominent; gland 0.4-1.2 mm above base. Peduncles solitary, 2.5-9 mm long, with shortly stalked glandular hairs, basal bract persistent; heads globular, 5-7 mm diam., 12-22-flowered, golden. Flowers 5-merious; sepals united in lower half. Pods oblong, to c. 3 cm long, c. 2-3 mm wide, coriaceous, moderately to densely covered with shortly stalked and sessile glands; mature seeds not seen. The taxon flowers in October (VicFlora 2018).

The plants are only known to reproduce vegetatively, forming dense stands of tens to hundreds of stems (VicFlora 2018). The taxon forms clones by root suckering and seed set appears to be rare. Isozyme analysis based on nine enzyme systems showed that plants within any single population are genetically identical (Cameron 2006).

There are probably 3000 mature individuals in total, but production of seed pods has only been observed in about five. Whether all mature individuals are capable of sexual reproduction is unknown, no successful seed set has been observed and there is a total of only nine genetically distinct individuals (Cameron 2006).

#### Generation Length

The generation length of *Acacia daviesii* is estimated to be 100 years, but in reality, the generation length is indefinite, since the taxon is only known to produce vegetatively.

#### Distribution

The taxon is known from only a handful of sites in dry open Eucalyptus woodland and forest near the Howqua River and Mt Timbertop, south east of Mansfield in north-eastern Victoria (VicFlora 2018). The populations occur over an area of up to 12 km<sup>2</sup>, ranging from 10 ramets in the smallest population to over 1000 ramets in the largest population (Cameron 2006). The extent of occurrence is less than 100 km<sup>2</sup> and the taxon has only been observed in two locations. There are probably 3000 mature individuals in total (Cameron 2006).

### Habitat

The taxon occurs in a mountainous, subalpine habitat (VicFlora 2018).

### Threats

There is a high risk of incremental continuing decline in the number of clones due to Sambar browsing, extreme drought stress and repeat fire events. One population has already been lost since 1976 situated on the Howqua River, 3 miles above Bridge on Mansfield-Jamieson Road.

### IUCN Criteria

| Criterion A. Population size reduction.<br>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> | <p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p> |
|--|---------------------------------------|---|

### Evidence:

#### Eligible under Criterion A3 as Endangered

The population reduction over the next 100 years is suspected to be 0 to 100% (midpoint 50%), based on (c) and (e) above.

There is a high risk of incremental future decline in the number of clones due to Sambar browsing, extreme drought stress and repeat fire events.

#### Eligible under Criterion A4 as Endangered

The population reduction over any 100 year period, including both past and future is inferred to be 10 to 100% (midpoint 50%), based on (c) and (e) above.

Past decline is based on subpopulation loss. One subpopulation has already been lost since 1976, on the Howqua River, 3 miles above Bridge on Mansfield-Jamieson Road. In the future, there is a high risk of incremental future decline in the number of clones due to Sambar browsing, extreme drought stress and repeat fire events. 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<br>Very restricted | Endangered<br>Restricted | Vulnerable<br>Limited    |
| B1. Extent of occurrence (EOO)  | < 100 km <sup>2</sup>                    | < 5,000 km <sup>2</sup>  | < 20,000 km <sup>2</sup> |
| B2. Area of occupancy (AOO)   | < 10 km <sup>2</sup>                     | < 500 km <sup>2</sup>    | < 2,000 km <sup>2</sup>  |
| 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 8 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA). The EoO has been made equal to the AoO to ensure consistency with the definition of AoO.

The taxon is estimated to be severely fragmented, and is inferred to have 1 location. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

There is a high risk of continuing decline in the due to Sambar browsing, extreme drought stress and repeat fire events.

If any one of these small subpopulations goes extinct, there is no probability of recolonisation because the taxon comprises vegetative clones only which are, therefore, sterile.

#### Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 8 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA, and observed from Fig. 2 in Bartolome et al. (2002).

As above, the taxon is estimated to be severely fragmented, and is inferred to have 1 location. It 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 C2 as Critically Endangered

It is estimated that there are 9 mature individuals. Isozyme analysis suggests that there may be as few as nine genotypes of this taxon. There are probably 3000 mature individuals in total, but production of seed pods has only been observed in about five. Whether all mature individuals are capable of sexual reproduction is unknown.

The number of mature individuals is inferred to continue to decline, and the number of mature individuals in each subpopulation is 50 or fewer.

| 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<br>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:<br>AoO: < 20 km <sup>2</sup> or<br>number of locations ≤ 5 |

### Evidence:

#### Eligible under Criterion D as Critically Endangered

The taxon is estimated to have 9 mature individuals.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

### References

- Bartolome, M., Walsh, N.G., James, E.A., and Ladiges, P.Y. (2002). A new, rare species of *Acacia* from north-eastern Victoria. *Australian Systematic Botany*, 15, 465-475.
- Cameron, D.G. (2006). Species Information Sheet - *Acacia daviesii*. Species Profile and Threat Database.
- DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne.
- VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Acacia daviesii*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/3b2a87ee-27d5-40cf-9f83-b74814b0290f>