

## *Daviesia genistifolia* Broom Bitter-pea

### Taxonomy

*Daviesia genistifolia* A. Cunn. ex Benth.

Old, unvouchered records of this taxon may include *D. devito* and *D. schwarzenegger*, which had been previously included in *D. genistifolia* (as in, e.g. Willis 1973) or *D. benthamii* (e.g. Jeanes 1996). The latter taxon is now regarded as being a Western Australian endemic. The mapped distribution of *D. genistifolia* probably exaggerates its natural range in Victoria (VicFlora, 2017).

### 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 A2bce+4bce; B2ab(ii,iii,iv,v)

### Species Information

#### Description and Life History

The taxon is a low multi-stemmed or slender shrub to 2 m tall; branches glabrous, grooved; branchlets terete. Phyllodes terete or vertically compressed, 5-30 mm long, 0.5-1.25 mm wide, spreading to slightly ascending, green, striate, rigid, pungent, articulate on branchlet. Inflorescences 1-few per axil, racemose, mostly 2-6-flowered, rachis 1.5-8 mm long; peduncle 0.5-1.5 mm long; pedicels to c. 2.5 mm long, subtended by an ovate to spatulate, concave, recurved bract c. 1 mm long. Calyx 3-4 mm long including 0.5-1 mm receptacle, teeth short, apiculate, slightly fimbriate, upper 2 partly united; corolla mostly yellow or orange; standard suborbicular, 6-8 mm long, 6-8 mm wide, yellow or orange with a crimson centre. Pod broad triangular, 8-11 mm long, 4-8 mm wide; seed usually 1, oblong-reniform, c. 4 mm long, compressed. The taxon flowers from August to October (VicFlora 2017).

#### Generation Length

The generation length of *Daviesia genistifolia* is estimated to be 50 to 75 years. This is based on a plausible pre-settlement fire interval of 50-75 years across the entire Victorian range of the taxon. Generation time may potentially exceed this estimate if the taxon is a resprouter as implied by the multi-stemmed habit. The taxon is likely to be an obligate seed regenerator, recruiting episodically following intense fire with only minor opportunist recruitment in response to localised site disturbance events.

#### Distribution

The taxon is scattered across northern Victoria from the South Australian border to near Wangaratta (e.g., Dimboola, Wedderburn, Nagambie and Chiltern areas) but is rare. The taxon also occurs in South Australia, Queensland, New South Wales, and Australian Capital Territory (VicFlora, 2017).

#### Habitat

According to VicFlora (2017) the taxon is found in dry sclerophyll forests, but site data suggests that many records occur at least on the margins of grassy woodlands or even grassland. Habitat range is therefore broader than that suggested by VicFlora (2017), with little support for 'dry sclerophyll forests'. Most records occur in grassy woodland,

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often with *Eucalyptus microcarpa* (Grey Box), sometimes in Mallee Scrub or Whipstick Scrub. For example, in 1959 Willis collected the taxon from the 'Southern fringe of Whipstick Scrub, 4 miles north of Huntly, near Bendigo. On sandy flats among *E. behriana* and *E. viridis*'. Elsewhere the taxon is recorded in *E. microcarpa* - *E. tricarpa* Box-Ironbark Forest, therefore overlapping, both ecologically, i.e. in habitat range, as well as geographically, with both *D. devito* and *D. schwarzenegger*, recent segregates from the *D. genistifolia* complex.

### Threats

The taxon has suffered significant historic decline in response to habitat loss to agriculture across the Victorian range with many extant site and specimen records falling within highly fragmented rural landscapes. Most extant records occur across highly fragmented and depleted rural landscapes, or near or just outside large blocks of public land or reserves, often on roadsides or in very small isolated remnant sites. For example, in 1948 Beauglehole collected the taxon in the 'Dimboola Flora Reserve, near town', this being the most recent record for this district, the only other record being an anonymous 1894 specimen from the 'Shire of Dimboola'.

Current and future threats include incremental habitat loss, particularly in fragmented rural landscapes, altered fire regimes, weed invasion, and pest animal browsing, noting that goats are able to browse even spiny plants, and kangaroos browse at least young plants. Spiny habit may expose some occurrences to unwitting but deliberate herbicide spraying or mechanical removal, particularly on roadsides or freehold land.

Many records occur at least on the margins of grassy woodlands or even grassland in which fires tend to be fast moving with lower intensity impacts in which a proportion of shrubs are not particularly intensely burnt and likely to survive or even resprout, at least at the time of settlement. Current planned burns, however, are often backburnt against the wind to reduce the risk of spread or escape which increases heat and therefore risk to shrubs in grassy habitats. The risk of local extinction is further exacerbated by small population size since few records suggest the taxon is locally common, most recording a single plant or few plants or record the taxon as rare or occasional.

### 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> |
|--|---------------------------------------|---|

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### Evidence:

#### Eligible under Criterion A2 as Endangered

The population reduction over the past 150 to 225 years is estimated to be 50 to 80% (midpoint 65%), based on (b), (c) and (e) above.

Past decline is based on extensive historic habitat loss to agriculture across the Victorian range of the taxon.

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

#### Eligible under Criterion A3 as Vulnerable

The population reduction over the next 100 years is estimated to be 30 to 50% (midpoint 40%), based on (b), (c) and (e) above.

Future decline is based on the current and projected impact of the identified threats.

#### Eligible under Criterion A4 as Endangered

The population reduction over any 150 to 225 years period, including both past and future (up to 100 years in the future), is estimated to be 50 to 80% (midpoint 65%), based on (b), (c) and (e) above. 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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 108 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas. This figure represents a lower bound, since a proportion of site records of *D. genistifolia* s.l. in the VBA are undoubtedly referable to *D. genistifolia*.

The taxon is estimated to be severely fragmented naturally at the regional scale and anthropogenically at the landscape scale. Most extant occurrences are geographically isolated and often highly disjunct, occurring at spacings greatly exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal. However, it is likely to be dispersed by ants (myrmecochory) at the metre scale.

It is estimated to have a continuing decline in (ii), (iii), (iv) and (v) above, based on the impact of the identified threats.

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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 as Data Deficient

There is no available estimate of current population size for Victoria.

| 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 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: *Daviesia genistifolia*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/16251f4a-96ef-4271-9156-be55745963df>