

## *Grevillea barklyana* Gully Grevillea

### Taxonomy

*Grevillea barklyana* F. Muell. ex Benth.

### Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1991).

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

### Proposed conservation status

Critically Endangered in Australia

Criterion B1ab(v)

### Species Information

#### Description and Life History

*Grevillea barklyana* is a large shrub or small tree to c. 10 m high, monoecious. Leaves usually irregularly pinnatifid, occasionally some simple and entire, narrowly ovate to elliptic or obovate in outline, 5–27 cm long, 2.5–12 cm wide; divided leaves with 2–11 broad sub triangular to ovate simple lobes each 10–40 mm long; lower surface with a dense, close indumentum of curled hairs; margin slightly recurved or flat. Conflorescences terminal, erect or deflexed, simple, secund, 4–10 cm long; rachises tomentose; perianth off-white to dusky brown, outer surface subsericeous to tomentose, inner surface glabrous; pistil 18.5–28.5 mm long, ovary sessile to clearly stipitate, subsericeous to subvillous, style pink to light red, glabrous, pollen-presenter oblique. Fruits subsericeous to tomentose, sometimes with purplish markings. Flowers Oct.–Dec. (VicFlora 20160).

It is fire sensitive and population recovery is from a soil-stored seed-bank; the seed longevity is unknown. Honeyeaters are the obligate pollen vectors. Honeybees are nectar robbers not pollinators (Vaughton 1996). Plants are probably self-fertile (as in the closely related *G. macleayana* of NSW) but outcrossing would be beneficial. Seeds are passively dispersed when ripe about 12 weeks after pollination. Seeds have no secondary dispersal mechanism and if not predated accumulate in the soil stored seed bank (Vaughton 1998). Gene-flow is thus only via the honeyeater pollinations.

#### Generation Length

The generation length of *G. barklyana* is suspected to be 25 to 50 years. This is based on the large size attained by the tree (up to 10 m tall) and extrapolated from other long-lived species in cultivation.

#### Distribution

*G. barklyana* is endemic to Victoria, where it is found along a few tributaries of the upper Bunyip and Tarago Rivers in west Gippsland.

#### Habitat

The taxon grows in wet tall open forest or damp forest in riparian situations, on lower slopes and low ridges on gravelly loam soils derived from granitic geology. Rainfall is 1000-1100 mm.

### Threats

The taxon is threatened by climate change (decreasing rainfall and drought, increased evaporation and extreme temperatures, increased frequency and intensity of fire); unseasonal planned burning (especially in winter); weed invasion (including *Ehrharta calycina* and *Freesia* hybrids); and decreased pollination success as the honeyeater pollinating guild declines because of reduced flowering and fragmented co-occurring floral resources. Its floral resources are seriously affected by increased frequency, intensity and timing of fires (both planned burns and bushfires). Forestry operations are considered a minor threat but can cause direct mortality and reduce regeneration. The plants are probably immune to herbivore grazing.

Spatial analysis of likely habitat on all land tenures for *G. barklyana* indicates that 46% occurs within the Comprehensive, Adequate and Representative (CAR) reserve system, including parks and reserves and special protection zones. Further areas are excluded from harvesting by prescription under the Victorian Code of Practice for Timber Production 2014 (the Code). Species-specific protections for the taxon are included in the Code.

### 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<br/>any of the<br/>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:

#### Ineligible under Criterion A

The past population reduction does not meet the threshold for eligibility under criterion A2, and the future population reduction does not meet the threshold for eligibility under criterion A3.

| 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 72 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 as an area within EoO.

It is inferred to have 1 location. It has a continuing decline in (v) above, due to the identified threats.

**Eligible under Criterion B2 as Endangered**

The Area of Occupancy (AoO) across the taxon's range is estimated to be 72 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it has 1 location and has a continuing decline in (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 as Data Deficient**

There is insufficient evidence to determine the number of mature individuals.

| 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:**

**Ineligible under Criterion D**

There is insufficient evidence to determine the number of 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.

SAC (1991). *Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing*. Nomination No. 39 *Grevillea barklyana*



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Vaughton, G. (1996) Pollination disruption by European honeybees in the Australian bird-pollinated shrub *Grevillea barklyana* (Proteaceae). *Plant Systematics and evolution* 200: 89-100.

Vaughton, G. (1998) Soil seed bank dynamics in the rare obligate seeding shrub, *Grevillea barklyana* (Proteaceae). *Australian Journal of Ecology* 23: 375-384.

VicFlora (2016) Flora of Victoria, Royal Botanic Gardens Victoria: *Grevillea barklyana*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/92da312f-6c64-420d-be00-ba915f9da836>