

## *Grevillea brevifolia* Cobberas Grevillea

### Taxonomy

*Grevillea brevifolia* F. Muell. ex Benth.

### 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 B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

### Species Information

#### Description and Life History

*G. brevifolia* is a shrub to 2.5 m high x 3.5 m wide; killed by moderate intensity fires and regenerating from seed (obligate seeder). Reproduction is by seed only. It is pollinated by honeyeaters and is probably an outcrossing species. Seeds accumulate in a soil-stored seedbank, but the longevity of seeds is unknown. Seeds are probably buried by ants after they eat the attached food body. Recruitment is continuous but pulsed after fire.

#### Generation Length

The generation length of *G. brevifolia* is suspected to be 35 to 80 years. This is based, in part, on the typical longevity of *Grevillea* plants (Neil Marriott pers. comm.) and an assumption of continuous recruitment. It is also influenced by the likely pre-European settlement fire interval which is likely to have been around 50-80 years across the Victorian range of the taxon. Intense fire events result in mass or pulse recruitment from soil-stored seedbanks.

#### Distribution

*G. brevifolia* occurs in subalpine and alpine eastern Victoria, and two sites in nearby New South Wales.

#### Habitat

*G. brevifolia* occurs in alpine and subalpine woodland between 1000 and 1500 m above sea level, mostly on rocky sites, slopes, ridges and outcrops. The geology is granitic, Ordovician sediments and extrusive volcanics (rhyodacite).

#### Threats

Threats include climate change (which is likely to result in decreasing rainfall, decreased snowfall, increased evaporation, extreme temperatures, and increased frequency and intensity of bushfires), unseasonal prescribed fire (especially in winter), impacts of fire control activities, and soil erosion and loss. Anthropogenic threats include roadworks, bridgeworks and other infrastructure works. Biotic threats include weed invasion (native and exotic species), Cinnamon Root-rot Fungus *Phytophthora cinnamomi*, the invertebrate pest Grevillea Leaf Skeletoniser and nectar robbing by honeybees (which are ineffective pollinators). A further threat is decreased bird pollination success as the honeyeater guild declines because of reduced flowering and fragmentation of co-occurring floral resources.

Spatial analysis of likely habitat on all land tenures for *G. brevifolia* indicates that 58% 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. 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> <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 Vulnerable

The population reduction over the next 100 years is suspected to be 10 to 50% (midpoint 30%), based on (c) and (e) above.

Future reduction of the taxon's population is based on the projected impacts of the identified threats.

#### Eligible under Criterion A4 as Vulnerable

The population reduction over any 105 to 240 year period, including both past and future (up to 100 years in the future), is estimated to be 10 to 70% (midpoint 40%), based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

The taxon has not been subject to significant historic habitat loss in the relatively remote areas in which it occurs. Some decline in population density may have already occurred in response to the early impact of the identified threats. An estimate of future decline is based on the projected impact of the identified threats.

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 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 Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 2,609 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the landscape scale since most occurrences are sufficiently distant naturally to preclude genetic exchange. Seed dispersal is passive and secondary dispersal (only a few tens of metres) is by ants (myrmecochory) which bury the seeds after eating the elaiosomes.

A single location is identified since all Victorian occurrences are subject to the same suite of key threatening processes.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, due to the identified threats, particularly climate change and changing fire regimes.

##### Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 105 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has 1 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:**

**Ineligible under Criterion C as Data Deficient**

No reliable estimate of the total population size for the taxon is available.

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 <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. Retrieved from: [https://www.environment.vic.gov.au/\\_\\_data/assets/pdf\\_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf](https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf)



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