



## *Grevillea willisii* Rock Grevillea

### Taxonomy

*Grevillea willisii* R.V. Sm. & McGill.

Two forms are known and recognition at the sub-specific level is likely, with the non-type form collected near Cory. Intermediate *G. willisii* and *G. pachylostyla* may have been identified as *G. willisii*.

### Current conservation status

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

### Proposed conservation status

Endangered in Australia

Criteria A3c; C2a(ii)

### Species Information

#### Description and Life History

The taxon is a spreading to erect shrub, 1–4.5 m high, to 3 m wide. Leaves 2.5–13.5 cm long, 2–6.5 cm wide, 5–11(–19)-partite, primary lobes simple or 3–5-fid, rarely some tertiary division on lower lobes; ultimate lobes oblong to narrowly triangular, 0.5–2.5 cm long, 3–17 mm wide; lower surface densely woolly-tomentose; margin shortly recurved. Conflorescences terminal, erect, simple, secund, (1–)3–8.5 cm long; rachis woolly-tomentose; perianth cream, outer surface tomentose, inner surface glabrous; pistil 11–18 mm long, ovary stipitate, subsericeous to subvillous, style cream, glabrous, pollen presenter oblique. Fruits softly tomentose with purplish-brown markings. Flowers September–January (VicFlora 2017).

The taxon resprouts after intense fire. It reproduces only by seed, and recruitment is continuous with a post-fire pulse from a soil-stored seed bank of unknown longevity. It is pollinated by honeyeaters, thus gene-flow is limited to a few hundred metres. Plants may be self-sterile, which is common in *Grevillea* taxa, thus it is dependant on cross-pollination. Seeds are passively shed, with secondary dispersal by ants, limited to a few tens of metres, which bury the seeds after eating the elaiosome.

#### Generation Length

The generation length of *Grevillea willisii* is suspected to be 50 to 100 years. This is based on W. Molyneaux's observations (pers. comm. to D. Cameron) that the taxon has a longevity of plausibly 50 - 100 years or more, hence generation time could easily exceed 100 years given clear evidence after a fire in 2003 of the ability to resprout rather than recruit from seed. The fire was so intense that any soil-stored seed in shallow granitic soil was likely to have been sterilised, implying most plants predated the fire.

#### Distribution

The taxon is apparently limited to one location on and around Bundara River, above its junction with Mitta River, north-west of Omeo on Omeo Highway. The form from Corryong has not been seen since 1975 and may be extinct.

### Habitat

The taxon grows among boulders in shrubby open eucalypt-dominated woodland on granite, either on slopes or along open stream banks.

### Threats

Threats to the taxon include the effects of climate change such as decreased rainfall, increased evaporation, and extreme temperatures, as well as increased frequency and intensity of fire, roadworks, weed invasion, nectar-robbing by introduced honeybees, decreased bird pollination success as the honeyeater guild declines because of reduced flowering, and fragmentation of co-occurring floral resources.

### 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>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 A3 as Endangered

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

Future decline is based on the impacts of the identified threats, particularly climate change and weed invasion.

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:**

**Ineligible under Criterion B**

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 9,754 km<sup>2</sup> and the Area of Occupancy (AoO) is estimated to be 40 km<sup>2</sup>, but other thresholds under this criterion have not been met.

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 <u>C1</u> or <u>C2</u>				
<u>C1</u>	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)
<u>C2</u>	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 Endangered

It is estimated that there are 700 to 1,000 mature individuals. This is based on data from R. Marshall (1997) (upper figure) and K. Seaton and A. Hill (2011).

The number of mature individuals is inferred to continue to decline due to the identified threats, and the percentage of mature individuals in one subpopulation is 95-100%.

Criterion D - Very small or restricted population <sup>Ⓜ</sup>			
	Critically Endangered <sup>Ⓜ</sup>	Endangered <sup>Ⓜ</sup>	Vulnerable <sup>Ⓜ</sup>
Number of mature individuals (observed or estimated) <sup>Ⓜ</sup>	<50 <sup>Ⓜ</sup>	<250 <sup>Ⓜ</sup>	<1,000 <sup>Ⓜ</sup>
D2 Only applies to the VU category <sup>Ⓜ</sup> 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. <sup>Ⓜ</sup>	- <sup>Ⓜ</sup>	- <sup>Ⓜ</sup>	D2 Typically: <sup>Ⓜ</sup> AoO < 20 km <sup>2</sup> or number of locations ≤ 5 <sup>Ⓜ</sup>

### Evidence:

#### Eligible under criterion D as Vulnerable

It is estimated that there are 700 to 1,000 individuals, and 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. 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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