

## *Pultenaea reflexifolia* Wombat Bush-pea

### Taxonomy

*Pultenaea reflexifolia* (J.H. Willis) de Kok

### Current conservation status

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

### Proposed conservation status

Vulnerable in Australia

Criteria A3bc+4bc; C1+2a(ii)

### Species Information

#### Description and Life History

The taxon is a shrub to 1 m high; stems terete, covered with pale, tangled hairs. Leaves alternate, elliptic to narrowly obovate, 5-10 mm long, c. 1 mm wide, reflexed, flat to concave; apex acute, usually not pungent; lower surface with sparse to moderate cover of pale hairs, veins obscure; margin strongly incurved; stipules 3-4 mm long, joined for c. half their length, overlapping and obscuring stem. Flowers single or 2 together at tips of short, lateral shoots; bracts broadly ovate 1-3 mm long, persistent, papery, margins ciliate; calyx 5-6 mm long, tube usually glabrous, lobes with pale hairs; bracteoles attached at base of calyx tube, ovate, 3-5 mm long, glabrous, margins ciliate; standard 6-9 mm wide; ovary and base of style covered with pale, silky hairs. Pod turgid, hairy. The taxon flowers in November (VicFlora, 2018).

#### Generation Length

The generation length of *Pultenaea reflexifolia* is estimated to be 20 to 40 years. This is based on a longevity of plausibly 30 years, a pre-settlement fire interval plausibly in the 20-40 year range and the likelihood that episodic fire-induced mass recruitment greatly exceeds the proportion of recruitment responding continuously to small scale soil disturbances.

#### Distribution

The taxon is endemic to Victoria. It is restricted to a few small areas of dry forest west of Melbourne in Gisborne, Barkstead and Lerderderg areas with an isolated, very old record from Apollo Bay (VicFlora, 2018).

#### Habitat

The taxon occurs in damp forest on coarse loamy sands (VicFlora, 2018).

#### Threats

The taxon is potentially threatened by imposed anthropogenic fire regimes and climatic warming and drying which, synergistically, increase the risk of recruitment failure in response to repeat fire events and extreme drought stress. The taxon is at risk from disturbance and damage caused by inappropriate land management, such as too-frequent planned burns and expansion of tracks, promoting dense growth species such as bracken, and exhaustions of the stored seed banks and. Browsing pressure on this taxon is unknown, but it may also possibly impact recruitment and growth.

### 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>(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> <p><i>based on any of the following:</i></p>			

### Evidence:

#### Eligible under Criterion A3 as Vulnerable

The population reduction over the next 60 to 100 years is suspected to be 30%, based on (b) and (c) above.

The magnitude of future decline is difficult to estimate with any confidence since the identified threats are likely to act stochastically and with unpredictable intensity. A conservative estimate of 30% is given as it seems highly likely that planned burns will continue in the habitat, due to the proximity to settlements. Increased burning may cause a larger reduction if it is not properly managed for this survival of this taxon.

#### Eligible under Criterion A4 as Vulnerable

The population reduction over any 60 to 120 year period, including both past and future (up to 100 years in the future), is projected to be 30%, based on (b) and (c) above.

There is no indication that this taxon has undergone any significant decline in the past three generations. An old Mueller records from 'Apollo Bay' suggests that it may have once also occurred further south, but this record is likely to be more than 120 years old.

It seems highly likely that planned burns will continue in the habitat. Increased burning may cause a larger reduction if it is not properly managed for this survival of this taxon.

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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 across the taxon's range is estimated to be 615 km<sup>2</sup> and the Area of Occupancy is estimated to be 260 km<sup>2</sup>, but other thresholds under this criterion have not been met.

There is no single threat or suite of threats that could impact all individuals at the same time.

It has a continuing decline in (iii) and (v) above, as a result of inappropriate imposed and natural fire regimes, and the frequency and intensity of bushfires are likely to increase in a warming and drying climate.

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				

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### Evidence:

#### Eligible under Criterion C1 as Vulnerable

It is estimated that there are 6,500 to 13,000 mature individuals. Most records indicate that, while a localised taxon, plants are common. It is estimated that each 2 x 2 km<sup>2</sup> grid is likely to consist of 100-200 mature individuals.

There is estimated to be a continuing decline of 30% within three generations.

#### Eligible under Criterion C2 as Vulnerable

It is estimated that there are 6,500 to 13,000 mature individuals, there is an estimated continuing decline and the percentage of mature individuals in one subpopulation is 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:

#### Ineligible under Criterion D

It is estimated that there are 6,500 to 13,000 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)

VicFlora (2018) Flora of Victoria, Royal Botanic Gardens Victoria: *Pultenaea reflexifolia*. Retrieved from:

<https://vicflora.rbg.vic.gov.au/flora/taxon/e0c465d1-29eb-459d-883a-458153501374>