

## *Pultenaea williamsoniana* Williamson's Bush-pea

### Taxonomy

*Pultenaea williamsoniana* J.H. Willis

### Current conservation status

Listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*.

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

### Proposed conservation status

Endangered in Australia

Criteria B1ab(i,ii,iii,v)+2ab(i,ii,iii,v); C2a(ii)

### Species Information

#### Description and Life History

The taxon is a slender, erect shrub to 3 m high; stems terete, covered with white hairs. Leaves alternate, terete, 6-15 mm long, 0.2-0.5 mm wide, grooved above, spreading at right-angles to stem or occasionally recurved; petiole remaining erect; apex acute, tapering to a slender pungent point; lower surface covered with pale hairs; upper surface not visible; stipules lanceolate, 1.5-2 mm long, dark brown, strongly recurved, slightly resinous. Inflorescence a loose cluster of 3-5 flowers at tips of short, lateral branches, pedicels densely bristly; bracts absent; calyx 4-5 mm long, resinous, lobes hairy; bracteoles attached below base of calyx tube, ovate to orbicular, 2-2.5 mm long, resinous; standard 9-11 mm wide; ovary and lower half of style hairy. Pod plump, sparsely hairy, well exerted from calyx. Flowers October (VicFlora 2019).

#### Generation Length

The generation length of *Pultenaea williamsoniana* is estimated to be 20 to 40 years. This is based on the 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 where it is confined to the northern Grampians, between Mt Zero and Mt Difficult.

#### Habitat

The taxon occurs in sandy soil on rocky slopes, and is usually associated with *Eucalyptus baxteri* and heathy understorey shrubs (VicFlora 2019).

#### Threats

A threat to the taxon is inappropriate fire regimes, as it is likely to germinate in response to fire as with many Fabaceae taxa, and fire frequency is important for plants to have time to mature and set seed before populations become senescent and die out. Other threats include visitor pressure, as there is some risk of accidental physical disturbance and trampling at the Hollow Mountain population especially where rock climbers descend, and road works, as populations tend to occur within 20 m or so of a road and are often spread over hundreds of metres (O.

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Carter and J. Downe pers. obs.). Given the numbers of plants close to roads and tracks, maintenance or upgrade works such as clearing of drainage lines, slashing, or track widening can physically damage plants.

Cinnamon Fungus (*Phytophthora cinnamomi*) is present near the Hollow Mountain population, although its effect on the taxon is unknown, and weed invasion of *Acacia longifolia* subsp. *sophorae* (Coast Wattle) is invading part of at least one population of the taxon (Carter 2006). Threats to the taxon are generally rated as low, although with the extremely limited distribution and low numbers of plants, the risk from stochastic events is probably high.

## 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;">based on any of the following:</p> <ul style="list-style-type: none"> <li>(a) direct observation [except A3]</li> <li>(b) an index of abundance appropriate to the taxon</li> <li>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</li> <li>(d) actual or potential levels of exploitation</li> <li>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</li> </ul>			

## Evidence:

### Ineligible under Criterion A

There is insufficient evidence to determine whether there has been a reduction in population under criterion A2. The future population reduction does not meet the threshold for eligibility under criterion A3.

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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:

### Eligible under Criterion B1 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 217 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented as it is known from just a single site and subpopulation, which precludes the possibility of recolonisation should this subpopulation become extinct.

It is estimated to have 1 location and has a continuing decline in (i), (ii), (iii) and (v) above, as a result of changed disturbance frequency and weed invasion.

### Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 52 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon is severely fragmented, has 1 location, and has a continuing decline in (i), (ii), (iii) and (v) above.

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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:

#### Eligible under Criterion C2 as Endangered

It is estimated that there are 1,000 to 4,000 mature individuals. Carter (2006) estimated a total of approximately 1,000 plants, however records by Jeanes in 2006 indicated thousands of plants on Copper Mine track. This record was made following a burn and it is unclear how many of these were mature plants, or if it represents a pulse recruitment event with the numbers now much lower.

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

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:

#### Eligible under criterion D 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.



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## References

Carter, O. (2006). *National Recovery Plan for Williamson's Bush Pea Pultenaea williamsoniana*. Department of Sustainability and Environment, Melbourne.

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne.

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Pultenaea williamsoniana*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/cd1e5cac-a3fb-4121-9b01-1c2aad431e07>