

## *Pultenaea williamsonii* Highland Bush-pea

### Taxonomy

*Pultenaea williamsonii* Maiden

Although first described by Maiden as a distinct species in 1905, the taxon was subsumed for many years under a broad circumscription of *P. paleacea*, a taxon now considered, under a narrow circumscription, to be endemic to New South Wales and Queensland.

### 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 A3ce; B2ab(i,ii,iii,iv,v)

### Species Information

#### Description and Life History

The taxon is an open, semi-prostrate shrub, branches lax, trailing or weakly ascending, to 70 cm long; stems terete with a few appressed, pale hairs when young, soon glabrous. Leaves alternate, elliptic to obovate 7-30 mm (mostly c. 20 mm) long, 2-8 mm wide; apex obtuse, terminating in a short, fragile mucro; upper surface glabrous, darker than lower; lower surface with sparse, pale appressed hairs; margin slightly recurved; stipules 3-7 mm long, light to mid brown, papery in texture. Inflorescence a head of 5-15 flowers; bracts 5-7 mm long, trifold at tip, central lobe covered with pale hairs, much narrower than outer lobes, all lobes tapered to slender, fragile tips; calyx 5-6 mm long, covered with white or pale golden hairs; bracteoles attached 0-0.5 mm from base of calyx tube, boat-shaped, 3.5-5 mm long, 1.5-2 mm wide, hairy along keel; standard 6-7 mm wide; ovary and base of style densely covered with pale hairs. Pod flat, lower half enclosed by calyx. The taxon flowers from November to December (VicFlora 2019).

#### Generation Length

The generation length of *Pultenaea williamsonii* is estimated to be 30 to 50 years. This is based on a plausible longevity of 25-50 years or more, and an inference from other lower stature shrubby *Pultenaea* taxa in similar elevated habitats. It is likely to be an obligate seed regenerator, recruiting episodically following rare fire events at a likely pre-settlement interval of 35-50 years or more. There is minor contribution from opportunistic recruitment in response to localised site disturbance events.

#### Distribution

The taxon is endemic to north-eastern Victoria. It is restricted to the Strathbogie Range, near Eildon, Wonnangatta Station, and in the far northeast (VicFlora 2019).

#### Habitat

The taxon occurs occasionally around margins of swamps, and adjacent to mountain forest (VicFlora 2019).

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Limited site data and specimen collector's notes suggest the taxon is commonly associated with *Eucalyptus camphora* subsp. *humeana* (Mountain Swamp-gum), *E. ovata* subsp. *ovata* (Swamp Gum), and, at higher elevations, *E. pauciflora* subsp. *pauciflora* (Snow Gum or White Sallee).

### Threats

The taxon may have experienced significant historic decline in response to habitat loss to agriculture, particularly in the Strathbogie Ranges. It is also likely to have suffered local extinction or density reduction across its geographic range in response to habitat modification, as a consequence of stock grazing of public land and imposed fire regimes. Such threats can have site-specific impacts on swamp margins and montane wet heath vegetation, including trampling, drying, and weed invasion of the habitat.

Key current and future threats include climatic drying and warming, and the increasing risk of repeat fire events at intervals below the tolerable fire interval for the taxon. It may also be threatened by targeted browsing and site disturbance by native and exotic herbivores, including Sambar Deer (*Rusa unicolor*) and feral pigs, which target swampy and moist habitats on which the taxon is dependent.

### 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 90 to 100 years is projected to be 30 to 50%, based on (c) and (e) above. Future decline is based on the projected impacts of the identified current and future threats.

#### Eligible under Criterion A4 as Vulnerable

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The population reduction over any 90 to 150-year period, including both past and future (up to 100 years in the future), is estimated to be 20 to 50% (midpoint 35%), based on (c) and (e) above.

The causes of reduction may not have ceased, be understood or be reversible.

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 Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 10,306 km<sup>2</sup>, based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the regional and landscape scale, and potentially also anthropogenically in the Strathbogie Ranges and in the far North East region. Geographically isolated stands occur at separations typically exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal. This precludes the possibility of recolonisation in the event of local extinction.

It is estimated to have 3 locations, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the current and projected impact of the identified threats, such as agriculture, stock grazing, imposed fire regimes, climatic drying and warming, repeat fire events below its tolerable fire interval, and targeted browsing by herbivores.

### Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 84 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 3 locations, and has a continuing decline in (i), (ii), (iii), (iv) 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:

#### 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:

#### Eligible under criterion D2 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.

### 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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VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Pultenaea williamsonii*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/c442ec21-9e36-4b35-b184-3e908670c567>