

## *Pultenaea polifolia* Dusky Bush-pea

### Taxonomy

*Pultenaea polifolia* A. Cunn.

### Current conservation status

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

### Proposed conservation status

Endangered in Victoria

Criterion B2ab(iii)

### Species Information

#### Description and Life History

The taxon is a procumbent or ascending, clammy-villous perennial shrub with branches to 50 cm long. Leaves not joined at nodes, lamina broad-ovate, 20-60 mm long, 10-30 mm wide, apex acute to obtuse and mucronate, base rounded to cordate, margins toothed, 3-veined from base; petiole 2-10 mm long. Flowers 1 or rarely 2 in axils; pedicels 1-2 cm long. Calyx 8-12 mm long, teeth somewhat unequal, 3-4 mm long; corolla yellow, tube 15-25 mm long with fine red lines, lobes rounded, more or less equal, spreading, with a patch of coarse hairs and brown blotches inside the lower side of open mouth. Capsule ovoid, 5-6 mm long. The taxon flowers mostly from November to February (VicFlora 2017).

#### Generation Length

The generation length of *Pultenaea polifolia* is estimated to be 30 to 50 years. This is based on a plausible longevity of 15-50 years and the likelihood that the taxon is a fire-sensitive obligate seed regenerator recruiting episodically in response to fire at a mean pre-settlement interval of 30-50 years. There may also be some low level continuous or trickle recruitment in response to localised site disturbance events or exceptional seasonal conditions.

#### Distribution

The taxon is restricted in Victoria to the north-east on Mt Granya, near Mitta Mitta, and near the upper reaches of the Bonang River in East Gippsland. The taxon also occurs in New South Wales and Australian Capital Territory (VicFlora, 2017).

#### Habitat

The taxon is uncommon in dry or moist forests (VicFlora 2017). Site and specimen data indicate that the habitat range includes both moist forest and drier forest and woodland across a range of elevations and soil types. Associated eucalypts, ranked by frequency, include *Eucalyptus croajingolensis* (Gippsland Peppermint), *E. angophoroides* (Apple Box), *E. globoidea* (White Stringybark), *E. viminalis* (Manna Gum), *E. cypellocarpa* (Mountain Grey-gum), *E. camphora* (Mountain Swamp-gum) and *E. polyanthemos* (Red Box).

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### Threats

The taxon is likely to have suffered significant decline through habitat loss to agriculture in parts of its range, such as the Shelley-Koetong district in the North East and the Dellicknora district in East Gippsland. In other parts of its range, such as the Victorian stronghold in the Raymond Creek, Sardine Creek and Goongerah districts in East Gippsland, the taxon is likely to have suffered only minor historic decline through habitat loss.

Current and future threats include targeted browsing by native or exotic herbivores, weed invasion, drought-induced recruitment failure, potentially exacerbated by targeted browsing, and the potential impact of repeat fire events at intervals approaching the tolerable fire interval for the taxon.

Sambar Deer (*Rusa unicolor*) are currently undergoing an increase in population throughout the Victorian range of the taxon and have demonstrated their ability to target stands of other *Pultenaea* taxa (e.g. *P. windorferi*), particularly during the vulnerable early stages of post-fire recruitment.

Weed invasion may be a threat in some sites such as the Pheasant Creek Flora Reserve in the Shelley-Koetong district, which is surrounded by pine plantations and already invaded by a wide range of weeds including *Erythranthe moschata* (Musk Monkey-flower) and, potentially, by pine wildings.

The taxon may also be susceptible to *Phytophthora cinnamomi* infection, noting that the habitat range is inferred to be of moderately low nutrient status and often with duplex soils and seasonally waterlogged, typically ecotonal to alluvial flats, not strictly riparian but often on lower valley foot slopes, in conditions conducive to the transmission of *P. cinnamomi* infection.

### 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> <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 A2 as Vulnerable

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The population reduction over the past 90 to 150 years is estimated to be 25 to 45% (midpoint 30%), 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 11,662 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the regional and landscape scales and anthropogenically at the landscape scale in some districts. All geographically isolated stands occur at separations exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal.

It is estimated to have 2 locations, and has a continuing decline in (iii) above based on the current and projected impact of the identified threats, such as browsing by herbivores, weed invasion, drought, repeat fire events, and *Phytophthora cinnamomi* infection.

### Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 104 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 2 locations, and has a continuing decline in (iii) 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

There is insufficient evidence to determine the number of mature individuals.

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 (2017) Flora of Victoria, Royal Botanic Gardens Victoria: *Pultenaea polifolia*. Retrieved from:  
<https://vicflora.rbg.vic.gov.au/flora/taxon/cfc89ddc-a3de-48f2-9710-cc3d826f0a88>