



Pultenaea juniperina Prickly Beauty

Taxonomy

Pultenaea juniperina Labill.

P. juniperina is treated here as a distinct form from the Grampians and Tonimbuk area. Mapped records from eastern Victoria are attributable to *P. forsythiana* (VicFlora 2019).

Plants from the Tonimbuk area differ in having smaller flowers and a glabrous calyx, but this form falls well within the range of variation seen in Tasmanian populations where the taxon is widespread and very variable (VicFlora 2019).

P. forsythiana is not always recognised, with most other Australian states treating it as a synonym of *P. juniperina* due to the presence of intermediate forms in Tasmania. However, in Victoria there are two clearly distinct entities. Plants from the Grampians and Gembrook (treated here as *P. juniperina*) have distinctly incurved leaves that are widest at the base and often cordate, and more or less concolourous, whereas the more widespread form in eastern and south-western Victoria (treated here as *P. forsythiana*) has leaves that are flat or concave with slightly incurved margins, that are linear or widest towards the tip, and usually turn dark purple on the undersurface (at least on drying). Further work is required to resolve the taxonomy and nomenclature of these two entities. Until then, plants are retained in *P. juniperina* and *P. forsythiana* respectively (VicFlora 2019).

Current conservation status

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

Proposed conservation status

Vulnerable in Victoria

Criterion D2

Species Information

Description and Life History

The taxon is a shrub to 1.2 m high; stems terete with short, curled hairs when young. Leaves alternate, lanceolate, 5-10 mm long; base often cordate; apex tapered to a slender, pungent point; concolorous or lower surface slightly darker than upper; margin incurved; stipules lanceolate, 2-3 mm long, appressed to stem. Flowers axillary, clustered at tips of short lateral branches; bracts absent; calyx 5-6 mm long, usually hirsute; bracteoles attached at base of calyx tube, lanceolate, 2-3 mm long, hairy, particularly along the prominent midrib; standard (7-)9-11 mm wide; ovary and lower half of style hairy. Pod turgid, hairy, lower half enclosed by calyx. The taxon flowers from October to November (VicFlora 2019).

Generation Length

The generation length of *Pultenaea juniperina* is estimated to be 35 to 75 years. This is based on a plausible longevity of 25-45 years, and an inferred dependence on fire for mass episodic recruitment at pre-settlement intervals of 45-75 years. The taxon is likely to be a fire-sensitive obligate seed regenerator, recruiting predominantly post-fire with some continuous recruitment in response to localised site disturbance events and seasonal conditions. The taxon is unlikely to resprout following fire, and soil-stored seedbanks are expected to persist indefinitely in the absence of fire.

Distribution

The taxon is restricted in Victoria to the Grampians, with a disjunct occurrence near Tonimbuk. In the Grampians it extends from the Halls Gap area south to Mt William and the Major Mitchell Plateau, and west to the Victoria Range. The taxon also occurs in Tasmania where it is widespread (VicFlora 2019).

With the exception of the Tonimbuk and Gembrook districts, mainland records east of the Grampians are attributable to *P. forsythiana* (Prickly Bush-pea) which has often been included within a broader circumscription of *P. juniperina*.

Habitat

In the Gembrook and Tonimbuk district the taxon is recorded in Damp Forest, Wet Forest, wet scrubby heathland, and at the edge of a dense swampy thicket. In the Grampians the taxon is confined to heathland or heathy understorey in moist forest (VicFlora 2019), including Damp Forest, Wet Forest, Lowland Forest, occasionally Heathy Dry Forest and Rocky Outcrop Shrubland.

The habitat is frequently dominated by *Eucalyptus obliqua* (Messmate Stringybark), *E. cypellocarpa* (Mountain Grey-gum), *E. falciformis* (Western Peppermint), *E. ovata* (Swamp Gum), or *E. baxteri* (Brown Stringybark). The taxon is often associated with minor drainage lines where often associated with *Acacia melanoxylon* (Blackwood), *Correa aemula* (Hairy Correa), *Gahnia sieberiana* (Red-fruit Saw-sedge), *Gleichenia dicarpa* (Pouched Coral-fern), *Leptospermum lanigerum* (Woolly Tea-tree), *L. scoparium* (Manuka), *Melaleuca squarrosa* (Scented Paperbark), and *Pteridium esculentum* (Austral Bracken). On the Major Mitchell Plateau the taxon is associated with *Eucalyptus pauciflora* subsp. *parvifructa* (Grampians Sallee), *Empodisma minus* (Spreading Rope-rush), and *Leucopogon neurophyllus* (Veined Beard-heath). In the Victoria Range the taxon is also associated with *Eucalyptus alaticaulis* (Grampians Grey-gum), *E. sabulosa* (Wimmera Scentbark), *E. victoriana* (Victoria Range Stringybark), *Austrostipa muelleri* (Wiry Spear-grass), *Gahnia radula* (Thatch Saw-sedge), *Hakea repullulans* (Western Furze Hakea), *Leptospermum turbinatum* (Shiny Tea-tree), *Monotoca billawinica* (Grampians Broom-heath), and *Tetrarhena juncea* (Forest Wire-grass).

Threats

The identified habitat range suggests that the taxon is ecologically adaptable and is likely to be resilient in the face of individual threats such as climate change and imposed fire regimes. The key threat to the taxon in the medium to longer term, however, is the combined impact of these threats operating synergistically. Climatic drying and warming, coupled with increasing frequency and landscape scale of natural and anthropogenic fire, increases the risk of recruitment failure and adult mortality. This may result in seedbank depletion, ultimate seedbank exhaustion, and local extinction. The increasing risk of repeat fire events at intervals approaching or below the tolerable fire interval for the taxon, which is likely to be 5-10 years, increases the risk of seedbank depletion and exhaustion. The increasing frequency, duration and intensity of extreme drought events also increases the risk of adult mortality and, particularly, recruitment failure during the early, vulnerable stages of post-fire recruitment.

The taxon may also be susceptible to targeted browsing by native and exotic herbivores, particularly during the early stages of post-fire recruitment. It may also be susceptible to infection by the exotic pathogen *Phytophthora cinnamomi* (Cinnamon Fungus) which is particularly active in seasonally moist habitats such as those frequently occupied by the taxon.

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:

Ineligible under Criterion A

There is insufficient evidence to determine whether there has been or will be a reduction in population sufficient to meet any threshold for Criterion A.

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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 ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 6,625 km² and the Area of Occupancy (AoO) is estimated to be 88 km², 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:

Ineligible under Criterion C as Data Deficient

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There is no available estimate of population size for the taxon. However, quadrat data and circumstantial field observations suggest that it is likely to be in the thousands, with the taxon sometimes locally common with projective foliage cover in the 25-50% range at the quadrat scale.

Criterion D - Very small or restricted population [Ⓜ]			
[Ⓜ]	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 ² or number of locations ≤ 5 [Ⓜ]

Evidence:

Eligible under Criterion D2 as Vulnerable

The taxon is estimated to be very restricted. The taxon has a restricted distribution, occurring in a single location, such that this restriction makes the taxon capable of becoming Critically Endangered or Extinct within a time frame of one or two generations. This is in response to the impact of the identified long-term threats, notably the combined impact of climatic drying and warming and increasing frequency and landscape scale of natural and anthropogenic fire, as well as browsing by herbivores, and infection by Cinnamon Fungus.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

References

Berg, RY (1975). Myrmecochorous plants in Australia and their dispersal by ants. *Australian Journal of Botany* 23 (3) 475 - 508.

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

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Pultenaea juniperina*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/3129c889-f576-4d5e-9723-8e475209ef43>