Threatened Species Assessment

Pultenaea foliolosa
Small-leaf Bush-pea

Taxonomy

Pultenaea foliolosa A. Cunn. ex Benth.

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria A3ce+4ce; B2ab(iii,iv,v)

Species Information

Description and Life History

The taxon is a soft, spreading shrub 1-2 m high; stems terete, pubescent, often golden. Leaves alternate, elliptic to orbicular, concave 1-3 mm long, 1-2 mm wide, often recurved; apex obtuse; upper surface usually pubescent and paler than lower; lower surface with spreading hairs; midrib inconspicuous; margin incurved; stipules lanceolate, 1-2 mm long. Flowers solitary in axils toward tips of short lateral branches; pedicels 1-2 mm long; bracts absent; calyx 4-5 mm long, tube sparsely hairy, upper lobes broad, narrowing abruptly into an acute point, lower lobes narrower, deeply divided, margins densely hairy; bracteoles attached about middle of calyx tube, leaf-like, 3-lobed, centre lobe green with spreading hairs, outer stipular lobes brown and papery; standard c. 8 mm wide; ovary and style glabrous except for tuft of hairs at base of style. Pod ovate, hairy at apex, enclosed by calyx. The taxon flowers from October to November (VicFlora 2019).

Generation Length

The generation length of *Pultenaea foliolosa* is estimated to be 35 to 50 years. The taxon is a fire-sensitive obligate seed regenerator which typically recruits episodically from a long-persistent soil-stored seedbank following intense fire events at pre-settlement intervals of 35-50 years or more. Although killed by intense fire, the taxon may senesce and persist in the seedbank in the prolonged absence of fire. Time to reproductive maturity is estimated at 5 years and longevity up to 50 years.

Distribution

The taxon is confined to small areas in the north-east, from the Warby Range to Myrtleford and Wodonga areas, and in Gippsland near Briagolong and north of Dargo. It is also found in Queensland and New South Wales (VicFlora 2019).

Habitat

The taxon is usually found in dry, open forest (VicFlora 2019) frequently dominated by *Eucalyptus macrorhyncha* (Red Stringybark) or *E. polyanthemos* subsp. *vestita* (Red Box) or, less frequently, *E. albens* (White Box)), *E. blakelyi* (Blakely's Red-gum), *E. bridgesiana* (But But), *E. goniocalyx* (Bundy), *E. melliodora* (Yellow Box), *E. microcarpa* (Grey Box), or *E. sideroxylon* subsp. *sideroxylon* (Mugga). It is also found rarely in the Heyfield district with *E. tereticornis* subsp. *mediana* (Gippsland Red-gum).

Threats

The taxon has undoubtedly suffered significant historic decline in some districts through habitat loss to agriculture and the chronic impacts of stock grazing, rabbit browsing, and weed invasion. Current and future threats include the impact of agricultural intensification in some districts, and the widespread use of planned burning which has the potential to exhaust the seedbank and expose recruiting stands to targeted browsing by rabbits, stock, goats, or increasingly by Sambar Deer (*Rusa unicolor*). In the longer term the greatest threats include targeted browsing by Sambar and the potential risk of adult mortality and recruitment failure in response to extreme and prolonged drought stress, leading to seedbank depletion, exhaustion and local extinction. Some sites in the north-east in particular, may also be threatened by competition during early stages of recruitment by notoriously high densities of noxious invasive weeds such as *Echium plantagineum* (Paterson's Curse or Salvation Jane), *Hypericum perforatum* subsp. *veronense* (St John's Wort), *Hypochaeris radicata* (Flatweed) or *Rubus anglocandicans* (Common Blackberry).

It is unclear whether repeat fire events are likely to be a significant threat since the rates of fuel accumulation in the typical habitat range of the taxon preclude the likelihood of fire intervals approaching or below the tolerable fire interval for 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%

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

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.

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*]

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.

based on any of the following:

(a) direct observation [*except A3*]

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Evidence:

Eligible under Criterion A2 as Vulnerable

The population reduction over the last 105 to 150 years is estimated to be 20 to 40% (midpoint 30%), based on (c) and (e) above.

Past decline is based largely on the historic impact of habitat loss to agriculture and associated habitat modification and degradation.

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

Eligible under Criterion A3 as Endangered

The population reduction over the next 100 years is projected to be 25 to 75% (midpoint 45%), based on (c) and (e) above. This is based on the projected impact of the identified current and future threats.

Eligible under Criterion A4 as Endangered

The population reduction over any 105 to 150 year period, including both past and future (up to 100 years in the future), is estimated to be 30 to 75% (midpoint 50%) 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 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²
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 18,472 km², 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 scales, and anthropogenically at the landscape scale in some districts. The taxon is likely to be dispersed by ants (myrmecochory) at the metre scale only.

It is estimated to have 4 locations, and has a continuing decline in (iii), (iv) and (v) above based on the current and projected impact of the identified threats, such as weed invasion, agricultural intensification, planned burning, and target browsing by herbivores.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 284 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above the taxon is severely fragmented, has 4 locations, and has a continuing decline in (iii), (iv) and (v) above.

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 no available estimate of population size for the taxon in Victoria, although it is likely to be in the thousands.

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 km2 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

DELWP (2015). *Victorian Flora Vital Attributes dataset.* Department of Environment, Land, Water and Planning, Victoria.

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Pultenaea foliolosa*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/0c7b5fc5-aed4-4a90-8c39-6ef93371aa4b