Threatened Species Assessment

Pultenaea prolifera
Otway Bush-pea

Taxonomy

Pultenaea prolifera H.B. Will.

In the Portland area *P. prolifera* is sometimes confused with *P. hispidula* but may be readily distinguished by the presence of 1-3 persistent, broad, brown bracts and broadly ovate bracteoles. *P. hispidula* lacks bracts, and the bracteoles are lanceolate, often leaf-like and stipular in Portland populations. Dried specimens of *P. prolifera* have been confused with *P. prostrata*, which also has broad brown bracts and bracteoles, but the calyx of *P. prostrata* has long lobes tapering into slender, acute tips, whereas the calyx of *P. prolifera* has short, broad lobes.

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 A3bce+4bce; B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is an erect shrub to 1.5 m high; branches long, often pendulous; stems terete, covered with loose, pale hairs. Leaves linear, terete, 4-10 mm long, 0.5-1 mm wide; apex obtuse; lower surface scabrous with pale, tubercle-based hairs; upper surface, if visible, glabrous; stipules lanceolate, 1-3 mm long. Inflorescence of 1 or 2 axillary flowers at tips of short, lateral shoots along branches; bracts broadly ovate, 2-3 mm long, hairy, margin ciliate; calyx 4-6 mm long, lobes broad, hairy, tube hairy at base; bracteoles attached at base of calyx tube, broadly ovate, 3-4 mm long, hairy, margin ciliate; standard 8-10 mm wide. Pod ovate, hairy, enclosed by calyx. The taxon flowers from September to October (VicFlora 2017).

Generation Length

The generation length of *Pultenaea prolifera* is estimated to be 60 to 90 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-) 60-90 (-120) 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 apparently endemic to Victoria, where it is confined to a few scattered, near-coastal localities in the west. This includes the Portland area, Chapple Vale, and Angahook State Park (VicFlora 2017).

Habitat

That taxon usually occurs in the heathy understorey of *Eucalyptus baxteri* or *E. obliqua* open forest (VicFlora 2017).

Threats

Historically, the taxon has suffered significant decline through habitat loss to agriculture.

Current and projected threats include continuing incremental habitat loss and modification in response to agricultural intensification, township expansion and infrastructure development for tourism, and 'sea change' demographic movements of residents attracted by the maritime climate and seascape lifestyle.

In the medium to longer term, however, the taxon is at increasing risk from climatic drying and warming, coupled with increasing frequency and landscape scale of natural and anthropogenic fire. When acting synergistically, the risk of recruitment failure and adult mortality is increased, resulting 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.

A proportion of occurrences occur in highly fragmented rural landscapes, or at the exposed margins of remnant stands of native vegetation. Such occurrences are at site-specific risk from edge effects such as stock agistment, weed invasion, or land management activities.

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 A3 as Endangered

The population reduction over the next 100 years is projected to be 30 to 50%, based on (b), (c) and (e) above.

Future decline is based on the projected impact of the identified threats, such as climatic drying and warming coupled with increasing frequency and landscape scale of natural and anthropogenic fire, extreme drought events, targeted browsing by native and exotic herbivores, and continuing incremental habitat loss and modification.

Eligible under Criterion A4 as Endangered

The population reduction over any 180 to 270 year period, including both past and future (up to 100 years in the future), is estimated to be 45 to 75%, based on (b), (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

The taxon is likely to have experienced significant historic decline in some districts in response to habitat loss to agriculture, and in response to other identified threats across the restricted geographic and ecological range of the taxon.

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 9,069 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. Most occurrences are isolated at separations 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 2 locations, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above due to the identified threats, such as agricultural intensification, township expansion, infrastructure development for tourism, 'sea change' demographic movements, climatic drying and warming, natural and anthropogenic fire, repeat fire events, extreme drought events, targeted browsing by native and exotic herbivores, stock agistment, weed invasion, and land management activities.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 144 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 2 locations, and has a continuing decline in (i), (ii), (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.

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

VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Pultenaea prolifera*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/7cb530f1-6a72-4a5c-acb6-9590a007777d