Threatened Species Assessment

Pultenaea capitellata
Hard-head Bush-pea

Taxonomy

Pultenaea capitellata Sieber ex DC.

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 A4ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a slender subshrub, ± prostrate; stems terete, pubescent, to 50 cm long. Leaves alternate, obovate, 3-12 mm long, 2-5 mm wide, flat; apex obtuse with a weak, recurved mucro; upper surface glabrous with depressed midrib and conspicuous lateral veins, darker than lower surface; lower surface covered with pale, silky, appressed hairs; margin flat or slightly recurved; stipules dark brown, 1-2 mm long, inconspicuous. Inflorescence capitate, dense, of more than 6 flowers; bracts persistent, imbricate, brown, hairy, apex 3-lobed, central lobe subulate; calyx 5-7 mm long, covered with long, pale, silky hairs; bracteoles attached at or below centre of calyx tube, linear 2-3.5 mm long, with ciliate margins and pale hairs down centre; standard 7-8 mm wide; ovary and base of style densely hairy. Pod flat, covered with pale hairs, two-thirds enclosed by calyx. The taxon flowers from November to January (VicFlora, 2017).

Generation Length

The generation length of *Pultenaea capitellata* is estimated to be 45 to 90 (midpoint 75) years. This is based on a plausible longevity of 25-45 years or more, and an inferred pre-settlement fire interval of 70-100 years. The taxon is likely to recruit episodically following very rare fire events, supplemented by continuous trickle recruitment in response to localised site disturbance events and seasonal conditions. The taxon is likely to be a fire-sensitive obligate seed regenerator (OSR) and is unlikely to resprout following fire. Like all members of the genus, soil-stored seedbanks are expected to persist indefinitely in the absence of fire.

Distribution

The taxon is uncommon, situated in the Bendoc-Delegate area, and the Bogong High Plains (HP) and Mt Cobberas. The taxon also occurs in New South Wales (VicFlora, 2017).

Habitat

The taxon is confined to wet areas adjacent to sub-alpine forest in the Bendoc-Delegate area, and alpine heath on Bogong High Plains and Mt Cobberas (VicFlora, 2017).

Threats

All sites are subject to past or current grazing by stock. The taxon may also be susceptible to targeted browsing by native and exotic herbivores, particularly during the early stages of post-fire recruitment. Most sites are now in the

Alpine National Park, but hare densities have noticeably increased since 2003. Brumby numbers on the Bogong High Plains are low compared to the Cobberas and are concentrated in the Mt Jim to Mt Cope areas in the headwaters of the Bundarra River. Occurrences in the Upper Delegate or Bendoc district are on either freehold land or State forest; all are likely to be subject to grazing by stock.

The taxon is a habitat specialist dependent on the hydrological stability of its wet heath and bog habitat (although in short- to medium-term, contraction of the latter communities may expand the ecotonal habitat that is apparently favoured by the taxon.) It is therefore susceptible to the impact of climatic drying and warming, which are projected to result in a progressive incremental contraction in the area and extent of its habitat. It is also at an increasing long-term risk of seedbank depletion and exhaustion in response to repeat fire events at intervals approaching or below the tolerable fire interval (TFI) for the taxon, which is likely to be 10-15 years.

The increasing frequency, duration and intensity of extreme drought events also increases the risk of adult mortality and, particularly, recruitment failure during the vulnerable early stages of post-fire recruitment.

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 past 135 to 270 years is estimated to be 15 to 30%, based on (c) and (e) above.

Past decline is based on the effects of the identified threats.

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

Eligible under Criterion A3 as Vulnerable

The population reduction over the next 100 years is projected to be 30 to 50% (midpoint 40%), based on (c) and (e) above.

Eligible under Criterion A4 as Endangered

The population reduction over any 135 to 270 year period, including both past and future (up to 100 years in the future), is suspected to be 40 to 60% (midpoint 50%), based on (c) and (e) above.

Past and future decline are based on the effects of the identified threats.

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 and B2 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 3,778 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The Area of Occupancy (AoO) across the taxon's range is estimated to be 48 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

The taxon is estimated to be severely fragmented naturally at subregional and landscape scales and, potentially, anthropogenically at the landscape scale in some districts. Geographically isolated occurrences are interpreted as distinct subpopulations since they occur at separations exceeding the dispersal range of the taxon, which has no specialised mechanism for long-distance dispersal.

Two locations can be identified based on landscape context and land tenure, with occurrences in the Bonang and Bendoc districts subject to site-specific threats that do not operate within parks and reserves.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the current and projected impact of the identified threats.

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 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 capitellata.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/6c7316e8-cc38-4a49-902b-4360c830d2af