Threatened Species Assessment

Pultenaea penna
Feather Bush-pea

Taxonomy

Pultenaea penna de Kok

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2014).

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

Proposed conservation status

Critically Endangered in Victoria

Criteria A2ac+3c+4ac; B1ab(i,ii,iii,iv,v); C1+2a(ii)

Species Information

Description and Life History

Erect to prostrate shrub, to 2 m high, bark brown to black; branchlets hairy. Leaves alternate 4.5-10 × 0.5-0.8 mm, linear, broadly u-shaped midvein prominent, paler above to margin ciliate; apex acute, Petioles not decurrent. Stipules 5.2-7.5 mm long. Inflorescences dense, flower-subtending bract herbaceous with enlarged stipules. Calyx 10-11 mm long, sparsely hairy; lobes all straight, yellow to orange with red striation at front and back; wing 8-10 mm long, yellow to orange; keel 8-10 mm long, yellow to red. Style gently curved. Pods not seen. Flowering in November-December (-February).

Generation Length

The generation length of *Pultenaea penna* is inferred to be 30 to 50 years. This is based on assumed post-fire episodic recruitment from the soil-stored seed bank at an inferred pre-settlement interval of at least 30-50 years. This is inferred from the minimum age of old-growth vegetation required by Lowan or Malleefowl.

Distribution

The taxon is known only from the Little Desert south of Lawloit, Kaniva and Nhill (VicFlora 2017). It is only known from two small populations within the Little Desert National Park (NP), where the two both grow within 500 m of McDonalds Highway. There is a further with a small population on freehold land at Miram South.

Past herbarium records indicate that this taxon was once more widespread north of the little Desert National Park, with a 1948 collection lodged by A.J. Hicks from near Lake Lawloit. This is now believed to be extinct. A 1940s collection was made from Stans Camp in the Little Desert NP, but the plant has not been seen there since.

Habitat

The taxon occurs in heath or mallee heath, and is less common in swamps or woodlands (sometimes *Eucalyptus obliqua* dominant) (de Kok and West 2003). It is also associated with *Allocasuarina muelleriana, Eucalyptus cneorifolia, E. conglobata, E. cosmophylla, E. diversifolia, E. leptophylla, Grevillea ilicifolia, Melaleuca gibbosa* or *Pteridium esculentum*. It favours sand to sandy clay or loam over limestone (de Kok and West 2003).

Threats

The known populations are on a roadside and are at risk from fire protection works, mechanical damage and increased frequency of controlled burns within the Little Desert particularly before the plant has matured and set seed. One population is on a firebreak and is at risk from both road maintenance and unnaturally frequent burning.

The populations, due to their small size, would be extremely vulnerable, and potentially become extinct, from events such as disease, inbreeding depression, inappropriate burning and climate change-induced increases in droughts.

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 Endangered

The population reduction over the past 90 to 150 years is suspected to be 40 to 80% (midpoint 60%), based on (a) and (c) above.

There is limited evidence to indicate the likely extent of past decline, although it may be considerable, given the apparent extinction of the taxon from Stans Camp and near Lake Lawloit.

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

Eligible under Criterion A3 as Endangered

The population reduction over the next 90 to 100 years is projected to be 35 to 65%, based on (c) above.

Future decline is based on the impact of fire management, mechanical damage inappropriate fire regimes, and potentially disease, inbreeding depression and climate change.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 90 to 150 year period, including both past and future (up to 100 years in the future), is suspected to be 40 to 80% (midpoint 65%), based on (a) and (c) 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 Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 70 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented naturally and anthropogenically at landscape scale with no mechanism for long distance dispersal.

It is estimated to have 1 location. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 12 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has one location 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:

Eligible under Criterion C1 as Critically Endangered

It is estimated that there are 200 to 240 mature individuals. The taxon is known from two small disjunct populations with less than 200 plants in the Little Desert NP, and a small population of perhaps 20 to 40 plants on freehold land at Miram South. The two populations in the Little Desert NP were visited and surveyed in October 2011 and March 2012 and (SAC 2014). Approximately 10 plants at are situated at the west end of McDonald Highway and approximately 190 plants are situated at the east end (Noushka Reiter pers. comm. 12/03/14).

There is an estimated continuing decline of 20 to 30% within one generation.

Eligible under Criterion C2 as Critically Endangered

It is estimated that there are 200 to 240 mature individuals.

The number of mature individuals is estimated to continue to decline, and the percentage of mature individuals in one subpopulation is 90-100 %.

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 D as Endangered

It is estimated that there are 200 to 240 mature individuals.

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

References

de Kok, R.P.J., and West, J.G. (2003). A revision of the genus *Pultenaea* (Fabaceae) 2. Eastern Australian species with velutinous ovaries and incurved leaves. *Australian Systematic Botany,* 16 (2), 252-254.

DEPI (2014) *Advisory list of rare or threatened plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne.

SAC (2014). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 840 *Pultenea penna.*

VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: Pultenaea penna. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/63fcb9d5-ccde-4148-9346-71e81e7b1b1f