Threatened Species Assessment

Podolepis aristata subsp. *affinis*
Grey Podolepis

Taxonomy

Podolepis aristata subsp. *affinis* (Sond.) Jeanes

The taxon was previously confused with *P. canescens*, a taxon endemic to north-eastern New South Wales.

P. aristata subsp. *aristata* and *P. aristata* subsp. *auriculata* differ in having aristate apices on the involucral bracts, and the former also has smooth involucral bract laminas (VicFlora 2015).

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criterion B2ab(i,iii,v)

Species Information

Description and Life History

The taxon is an erect, simple or branched, wiry annual herb, to 40 cm high; stems sparsely woolly to glabrescent. Leaves woolly to cobwebbed, less densely so above, margins flat to revolute, entire; basal leaves often withered at anthesis, usually oblanceolate, to 12 cm long and 15 mm wide, petiolate, base amplexicaul, apex acute; cauline leaves linear-lanceolate, 1-12 cm long, 3-15 mm wide, sessile, stem-clasping, apex acute. Capitula hemispherical, 10-20(-25) mm diam., many in short cymes, rarely solitary; peduncles 1-6 cm long; involucral bracts with slender linear, glandular claws; lamina more or less triangular to ovate, acute to shortly acuminate, scarious, transversely rugose at least distally, shiny; intermediate bracts 6-12 mm long, with linear glandular claws shorter than the lamina; inner bracts long-clawed. Florets yellow; ray florets 20-30, 10-20 mm long; disc florets numerous. Cypselas 1.5-2 mm long; pappus bristles 15-20, free, 4-8 mm long. The taxon flowers from August to November (VicFlora 2015).

Generation Length

The generation length of *Podolepis aristata* subsp. *affinis* is estimated to be 1 to 15 year (midpoint 5 years), however this is rather speculative. As an annual, the taxon may recruit from seed each year but, if seasonal conditions are variable and unreliable, recruitment may be episodic and limited to optimal seasons at intervals determined by El Niño and La Niña cycles. Longevity is inferred to be no more than one year, but field observations are required to confirm this.

Distribution

In Victoria, the taxon is confined to the north-west. Site and specimen records suggest that its current stronghold is within Wyperfeld National Park along the northern outfall of the Wimmera River ending at Pine Plains and Wirrengren Plain, and in the Sunset Country north of Pink Lakes. In long-settled districts across the Wimmera and Mallee regions the taxon is largely represented by specimens taken during the late nineteenth and early twentieth centuries. It also occurs in WA, SA, Qld, and NSW (VicFlora 2015).

Habitat

Site and specimen data suggests that the taxon most frequently occupies sandy loam, silty or cracking clay loam soils, often in natural or anthropogenic clearings in proximity to sandy mallee vegetation, salt pans or samphire flats. It appears to be less frequent within sandy mallee vegetation than is suggested by VicFlora (2015). Most sites are at least moderately weedy, reflecting a long history of stock grazing prior to declaration of the Wyperfeld and Murray Sunset National Parks.

Frequent association with *Lawrencia squamata* (Thorny Lawrencia) at the quadrat scale suggests the taxon is associated with clay, often gypsum-rich, soils fringing salt lakes and saline depressions although there are no other frequent associates to support the inference that the taxon is tolerant of saline conditions. At the disjunct southern limit of its geographic range near Natimuk in the Western Wimmera, the taxon occurs on a lunette in remnant grassland on sandy loam with some limestone nodules in association with the highly threatened *Pimelea spinescens* subsp. *pubiflora* (Wimmera Rice-flower).

Threats

The taxon has undoubtedly suffered significant historic decline through habitat loss to agriculture in most districts outside the Wyperfeld and Murray Sunset National Parks. The antiquity of most specimen records within highly fragmented agricultural landscapes suggests the taxon is long extinct in many long-settled districts. Remnant stands in such landscapes continue to be threatened with local extinction through incremental habitat loss and habitat degradation in response to a wide range of agricultural and infrastructure management practices.

Many sites within parks and reserves also bear the legacy of historic stock grazing which eliminated the most palatable taxa, and facilitated invasion by both annual and perennial exotic weeds. Competition by exotic weeds continues to be a major threat across all districts. The cancellation of grazing licences at the time of park declaration may actually have compounded the continuing threats to the taxon by allowing greater competition from both native and exotic annuals and perennials, with established exotic perennials such as *Marrubium vulgare* (Horehound) representing the greatest long-term threats to the taxon.

In the longer term, the taxon may be threatened by climatic drying and warming which may increase the risk of recruitment failure in response to extreme drought stress, and targeted browsing by rabbits, stock, and kangaroos, resulting in seedbank depletion and local extinction.

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 10 to 45 years is suspected to be 5 to 30%, based on (c) and (e) above.

Despite significant historic decline inferred from the predominance of historic collections across a significant proportion of the Victorian range of the taxon, the proportion of this decline which is likely to have occurred within the last three generations cannot be estimated with any confidence in the absence of a confident estimate of generation time. Longitudinal monitoring data is unavailable for this taxon. Any apparent trend would be difficult to distinguish from fluctuations in population density resulting from drought cycles across generational time frames.

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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 288 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented naturally at the regional and landscape scales, and anthropogenically at the landscape scale in many districts. Geographically isolated occurrences typically occur at spacings which are likely to exceed the dispersal range of the taxon which is likely to be wind-dispersed at the kilometre scale, with the vast majority of seed falling within 10-100 m of the adult plant.

It is estimated to have 2 locations, and has a continuing decline in (i), (iii) and (v) above based on the current and projected impact of the identified threats, particularly the almost ubiquitous threat of competition from exotic weeds.

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 current population size for the taxon in Victoria.

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:

Ineligible under Criterion D as Data Deficient

There is insufficient evidence to determine the number of mature individuals.

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/0016/50452/Advisory_List_of_Threatened_Invertebrate_Fauna_2009_FINAL_Sept_2009.pdf

VicFlora (2015). Flora of Victoria, Royal Botanic Gardens Victoria: *Podolepis aristata* subsp. *affinis*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/970bcc62-58a3-438a-916c-1ebcfca72415