

## *Podolepis muelleri* Small Podolepis

### Taxonomy

*Podolepis muelleri* (Sond.) G.L.R. Davis

### Current conservation status

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

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

### Proposed conservation status

Critically Endangered in Victoria

Criteria B1ab(iii)c(ii,iii,iv)+2ab(iii)c(ii,iii,iv)

### Species Information

#### Description and Life History

The taxon is an erect or ascending, few-branched annual to 5-22 cm high. Stems wiry, slightly cobwebbed to glabrescent. Leaves somewhat cobwebbed, basal ones few, elliptic to oblanceolate, 1-4 cm long, to c. 15 mm wide, soon withering; cauline leaves lanceolate, 1-4 cm long, to c. 7 mm wide, base amplexicaul, apex acute. Capitula hemispherical to campanulate, 3-7 mm diam., few in loose cymes, shiny; peduncles mostly 1-4 cm long; involucre bracts broadly ovate, minutely erose-ciliate, straw-coloured, often bluish distally, smooth, apex acute; intermediate bracts c. 4 mm long, with curved linear glandular claws; inner bracts with broad, thickened oblong claws adhering to form a rigid leathery cup, lamina small, scarious, triangular. Florets all tubular, yellowish; outer florets 3-7, female, sterile; inner florets 18-40, bisexual, slightly longer than involucre. Cypselas c. 1.5 mm long; pappus bristles only on bisexual florets, 5-13, shortly connate at base, 2-3 mm long. Flowers August-October (VicFlora 2018).

#### Generation Length

The generation length of *Podolepis muelleri* is estimated to be 1 year. This is based on the taxon being an annual reproducer.

#### Distribution

In Victoria, the taxon is known only from a single location near Lake Tyrrell in the north-west. It is also found in South Australia, Queensland, and New South Wales (VicFlora 2018).

#### Habitat

At Lake Tyrrell, *P.muelleri* grows on fine textured light clay soils and sub-saline sodic gypsiferous soils on the remnant old lake bed surface, sitting elevated 3-4 m above the current bed of Lake Tyrrell. The vegetation is chenopod scrubland, with *Atriplex vesicaria* subsp. *macrocystidia*, *Disphyma crassifolium* subsp. *clavellatum*, *Zygophyllum angustifolium*, *Rhodanthe polygalifolia*, and *Scleroblitum atriplicinum* all present.

Outside Victoria the taxon occurs mainly on grey heavy clay soils, but also finer textured red brown soils, predominantly in bladder saltbush communities (Cunningham et al. 1981).

### Threats

The floristic community at the Lake Tyrrell site is distinctive and depleted in Victoria, readily degraded by sheep grazing. The taxon's absence from the surrounding landscape is likely to be due entirely to sheep grazing, as it has a much wider ecological amplitude than that of the current known population. The site is almost weed free, with only *Medicago minima* present. The taxon is also threatened by possible water level rises in Lake Tyrrell, which would lead to lake shore regression.

### 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%
<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>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.</p> <p>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]</p> <p>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.</p>			
<p>based on any of the following:</p> <ul style="list-style-type: none"> <li>(a) direct observation [except A3]</li> <li>(b) an index of abundance appropriate to the taxon</li> <li>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</li> <li>(d) actual or potential levels of exploitation</li> <li>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</li> </ul>			

### Evidence:

#### Ineligible under Criterion A

There is insufficient evidence to determine whether there has been or will be a reduction in population sufficient to meet any threshold for Criterion A.

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 km <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
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 4 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

It is projected to have 1 location, as all key identified threats apply across its range and can rapidly affect all individuals of the taxon present.

It has a continuing decline in (iii) due to degradation from sheep grazing, and extreme fluctuations in (ii), (iii) and (iv) above, as it is an annual herb and dependent on favourable winter-spring rainfall. During drought it is possible that it may be greatly reduced in numbers or absent.

#### Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 4 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, the taxon has 1 location, has a continuing decline in (iii), and extreme fluctuations in (ii), (iii) and (iv) above.

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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

It is estimated that there are 10,000 to 80,000 mature individuals, which exceeds the thresholds for criterion C.

Criterion D. Very small or restricted populations		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 km <sup>2</sup> or number of locations ≤ 5

### Evidence:

#### Eligible under criterion D 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

Cunningham, G.M., Mulham, W.E., Milthorpe, P.L., and Leigh, J.H. (1981). *Plants of western New South Wales*. Soil Conservation Service of New South Wales.

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



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VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Podolepis muelleri*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/918d6067-c2a6-4b0b-b4d0-e1a9b30ecfd2>