Threatened Species Assessment

Lepidium phlebopetalum
Veined Peppercress

Taxonomy

Lepidium phlebopetalum (F. Muell.) F. Muell.

The 'short-styled' and 'long-styled' forms of this species may represent distinct taxa (VicFlora 2017).

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria B2ab(i,ii,iii,iv,v)c(iv); C2b

Species Information

Description and Life History

The taxon is an annual or perennial herb, to c. 10 cm high, without hairs, smooth to papillose; stems decumbent to erect. Leaves lanceolate to linear, to 5 cm long, 2-3 mm wide, entire, thick, succulent to leathery, sometimes deciduous under dry conditions. Inflorescence an elongating raceme. Sepals 2-2.5 mm long; petals 3-4 mm long, clawed, white to purple, veins more deeply coloured; stamens 6. Fruit ovate to orbicular, 6-9 mm long, 5-7 mm wide, narrowly winged, notched at apex, valves usually papillose; style 0.5-2 mm long, shorter than or exceeding valves; pedicels 3-6 mm long, usually papillose. Flowers mostly spring (VicFlora 2017). The taxon is common near Budgerum where it is strictly annual and presumed to be the "short style form" suggesting the "long style form" is the perennial shrub.

Generation Length

The generation length of *Lepidium phlebopetalum* is estimated to be 2 to 20 years. According to VicFlora (2017) *Lepidium phlebopetalum* is an annual or perennial small shrub. This suggests an upper bound for longevity of 20 to 30 years with a generation time ranging from 2-20 years and unlikely to exceed 25 years, but it is difficult to estimate. There are two forms of this taxon that may represent different taxa, presumably the short style form being an annual, and perennial individuals belonging to the long-style form.

Distribution

The taxon occurs in arid regions of all mainland states. It is very rare in Victoria, recorded in recent times only from the Quambatook area. Early records from the far north-west exist, but it is uncertain if the species persists there (VicFlora 2017).

Habitat

Quadrat data suggests that the taxon is associated with heavier textured reasonably well drained potentially gilgai soils where it is more likely to be on elevated mounds. According to VicFlora (2017) *Lepidium phlebopetalum* occurs in open herbfields often in relatively bare sites with crusting red clay loam soils. From a 2013 collection Neville Walsh (pers. comm.) noted the taxon was growing on bare dry scalds with *Maireana pentagona* and *M. cheelii,* in Buloke Woodland; these being comparable to bare stabilised soil at the north-wes.

Threats

All sites are in highly fragmented and modified environments that are unprotected and continue to decline, due to habitat loss and degradation from ongoing land clearing, stock grazing, weed invasion, cropping, rabbits and climate change.

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 6 to 60 years is suspected to be 30 to 50% (midpoint 40%), based on (a), (b), (c), and (e) above.

The past decline over the last three generations is unlikely to exceed 40%, with the greatest habitat loss prior to the three-generation time period. A range of 30 to 50 % reflects uncertainty.

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

Eligible under Criterion A3 as Vulnerable

The population reduction over the next 6 to 60 years is suspected to be 30 to 50% (midpoint 40%), based on (b), (c), and (e) above.

The taxon is expected to continue to decline in future at a similar rate to the past.

Eligible under Criterion A4 as Vulnerable

The population reduction over any 6 to 60 year period, including both past and future, is suspected to be 30 to 50% (midpoint 40%), based on (a), (b), (c), and (e) above.

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 18 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, considering the limited dispersal ability of the taxon, the barriers to dispersal, or the lack of habitat separating them.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above due to the identified threats, most notably due to decline in habitat quality.

It is estimated to have extreme fluctuations in (iv) above in response to climatic fluctuations, this being the case for the largest subpopulation in the Lower Avoca Plains. The taxon is only likely to be present in higher quality habitat and is probably most abundant in wet years and could be dramatically reduced or even completely disappear during droughts. Whilst the perennial form is unlikely to have experienced extreme fluctuations it is possibly more restricted, hence the overall assessment for the taxon as being prone to extreme fluctuations.

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 C2 as Endangered

It is estimated that there are 1,200 to 3,600 individuals, based on extrapolating indicative estimates of the Lower Avoca Plains sites across all records. The broad population range estimate is based on a lack of data regarding the actual habitat extent, as well as condition within sites.

It has an inferred continuing decline and has extreme fluctuations in 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 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

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

VicFlora (2017). *Lepidium phlebopetalum,* Royal Botanic Gardens Victoria: *Lepidium phlebopetalum*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/5a814811-d086-4e42-b7ac-c470b06bad50