

Lepidium monoplocoides Winged Peppergrass

Taxonomy

Lepidium monoplocoides F. Muell.

Current conservation status

Listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999*.

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1993).

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

Proposed conservation status

Endangered in Victoria

Criteria A2ce+3ce+4ce; B2ab(iii,v)c(iv)

Species Information

Description and Life History

The taxon is an annual herb with erect stems, to 20 cm tall. Leaves are narrowly linear, pinnately lobed or entire, 5 - 10 cm long and 1 - 2 mm wide and are arranged along and at the base of stems. Flowers and fruit are observed in the spring and summer. The inflorescence is an elongating raceme with tiny green-brown flowers; 2 mm wide, with sepals 1 mm long and petals inconspicuous to absent. Fruits are broadly ovate to circular, 5 mm long and 4 mm wide, and borne on flattened pedicels to 3 mm long. The apex of the fruit is pointed with a small notch and two smooth wings that are divided into halves that surround the entire fruiting body (DSE 2009). The taxon flowers mostly from spring to summer (VicFlora 2017).

Generation Length

The generation length of *Lepidium monoplocoides* is estimated to be 10 to 30 years (midpoint 15 years). Although the taxon is an annual herb that may live into a second season in favourable circumstances (i.e., biennial longevity), generation time is based on a plausible pre-settlement interval of inundation events which was typically 10-15 years, but up to 20-30 years at the northern end of the Wimmera outfall system. The taxon is inferred to recruit following inundation from a long-persistent seedbank which is inferred to survive at least 20-30 years.

Distribution

The taxon is widely distributed on the inland plains of south-eastern Australia, occurring from northern New South Wales to western Victoria, with an old record from southeastern South Australia. The taxon occurs in the Murray Darling Depression, Riverina, Darling Riverine Plains, and Cobarr Penneplain Bioregions (DSE 2009).

Currently, the Winged Peppergrass is known from seven locations in Victoria: a small stand in the Hattah-Kulkyne National Park, between Lake Hattah and Lake Bulla; two stands on the Murray River floodplain in Barmah State Park and near Reedy Lagoon in the Gunbower Reserve; in the Stony Plain Bushland Reserve, 20 km east of Sealake; two populations in Wyperfeld National Park; and in the West Wail Flora and Fauna Reserve, north-west of Horsham (DSE 2009).

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Habitat

The taxon mostly occurs near lakes and watercourses (VicFlora 2017). It is generally found in areas with an average rainfall range of 200-450 mm per year on heavy clay and clay loam soils, with some sites prone to water-logging (DSE 2009).

Threats

Current and future threats include exposure of seedbanks to wind erosion or deposition, a potentially increased risk of herbivory by macropods, rabbits, and stock, and a reduction in reliable germination opportunities given the range of hydrological modification across the Victorian range, such as greater intervals between inundation. The taxon is also threatened by incremental habitat loss through agricultural intensification, stock grazing, weed invasion, diversion of flood waters, reduced seed set and seedbanking, and the increasing impact of climatic drying on the frequency and local extent of flooding. Some occurrences are at high risk of increasing salinity and elevated saline ground water.

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>	<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>
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Evidence:

Eligible under Criterion A2 as Endangered

The population reduction over the past 30 to 90 years is estimated to be 50 to 80% (midpoint 65%), based on (c) and (e) above.

Past decline is based on habitat loss to agriculture, drainage of wetlands, stock grazing, weed invasion, and diversion of floodwaters for agriculture including irrigation and town water supply.

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

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Eligible under Criterion A3 as Endangered

The population reduction over the next 30 to 90 years is projected to be 50 to 80% (midpoint 65%), based on (c) and (e) above.

Future reduction is based on the current and projected impact of the identified threats.

Eligible under Criterion A4 as Endangered

The population reduction over any 30 to 90 year period, including both past and future (up to 100 years in the future), is estimated to be 50 to 80% (midpoint 65%), based on (c) and (e) 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 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 89 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. The occurrences in isolated subcatchments occur at separations exceeding the dispersal range of the taxon, since it has no mechanism for long-distance dispersal other than dispersal within subcatchments by floodwaters.

Two locations can be identified based on landscape context: one for occurrences on floodplains that are dependent on inundation by floodwaters, and one for occurrences in internal drainage basins reliant on rainfall events for inundation.

It has a continuing decline in (iii) and (v) based on the current and projected impact of the identified threats. It has extreme fluctuations in (iv) above in response to seasonal conditions and inundation events.

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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 50,000 to 60,000 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 ² 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

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