Threatened Species Assessment

Lomandra micrantha subsp. *tuberculata*
Small-flower Mat-rush

Taxonomy

Lomandra micrantha subsp. *tuberculata* J. Everett

Unvouchered site records and several specimen records in central and eastern Victoria appear to result from misidentification of related *Lomandra* taxa some of which, like *L. micrantha*, exhibit a great diversity of morphological traits. As currently circumscribed, *Lomandra micrantha* displays a bewildering diversity of leaf morphologies. This is paralleled by a similar diversity of morphologically distinctive variants within *L. filiformis* as currently circumscribed. Each of these complexes await taxonomic investigation to determine whether the diversity of forms represent distinct taxa which are not adequately accounted for by the recognition within each complex of only two infraspecific taxa.

Current conservation status

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

Proposed conservation status

Vulnerable in Victoria

Criteria A2c+3c+4c; D2

Species Information

Description and Life History

Lomandra micrantha is a perennial graminoid with small tussocks. Leaves flat, plano-convex to terete, 20-70 cm long, up to 5 mm wide, glaucous, red-brown basally; basal sheath gradually tapering distally, usually torn, dark to light brown; apex broadly acute to obtuse. Male and female inflorescences dissimilar, up to 0.3-0.75 times as long as the leaves; axes smooth, slightly scabrid or conspicuously covered with wart-like projections; non-flowering axis hidden or exposed for 0.5-2.5 cm. Male inflorescences branched, 6-27 cm long, c. one- to three-quarters as long as the leaves; flower-bearing axis 3-15 cm long; flowers separate or in pairs. Female inflorescences branched or unbranched, 3-18 cm long; flower-bearing axis 3-5 cm long; flowers separate. Bracts 1-3 mm long, pale brown to translucent. Flowers pedicellate, greenish-yellow to dark red; perianth segments similar, spreading or reflexed at anthesis; male flowers separate or in pairs, 1.5-3 mm long; female flowers separate, 3-5.5 mm long (VicFlora 2019b).

Subspecies *tuberculata* is distinguished from subspecies *micrantha* by its leaves which are gently twisted longitudinally or stiff and erect, plano-convex to subterete (in cross-section), flat, inrolled or folded, 0.8-5 mm wide; basal sheath with margin intact or occasionally slightly torn. Non-flowering axis of inflorescence hidden or exposed; axes conspicuously covered with wart-like projections. Male inflorescence 10-30 cm long. Female inflorescence 7-18 cm long. The taxon flowers from May to September or occasionally to November (VicFlora 2019a).

Generation Length

The generation length of *Lomandra micrantha* subsp. *tuberculata* is estimated to be 35 to 50 years. This is based on a plausible longevity of 35-50 years as well as a combination of episodic post-fire recruitment at pre-settlement intervals of 35-50 years or more and sporadic, opportunistic, or continuous recruitment in favourable seasons, often in response to localised site disturbance events. The taxon can resprout post-fire from a short subterranean rhizome.

Distribution

The taxon occurs in Victoria chiefly in and around the Grampians but with outlying occurrences near Portland and Seymour. The taxon also occurs in South Australia and New South Wales (VicFlora 2019a). Unvouchered site records and several specimen records in central and eastern Victoria appear to result from misidentification of related *Lomandra* spp., some of which, like *L. micrantha*, exhibit a great diversity of morphological traits. Each of these taxa represent complexes awaiting taxonomic investigation to determine whether the diversity of forms represent distinct taxa.

Habitat

The taxon occurs in sandy soils of heathlands and heathy woodlands (VicFlora 2019a).

Threats

The taxon is likely to have suffered historic decline through habitat loss to agriculture in the Western Wimmera and the Dundas Tableland and in the Edenhope, Casterton, and Portland districts. Current and future threats include incremental habitat loss in fragmented rural districts and the long-term synergistic impacts of increasing fire risk and climatic drying and warming, resulting in an increasing risk of adult mortality, recruitment failure and seedbank depletion and exhaustion.

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 105 to 150 years is estimated to be 20 to 30%, based on (c) above.

Past decline is based on historic habitat loss to agriculture in the Western Wimmera, Dundas Tableland and the Edenhope, Casterton, and Portland districts.

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 100 years is projected to be 20 to 45% (midpoint 30%), based on (c) above.

Future decline is based on the projected impact of the identified threats.

Eligible under Criterion A4 as Vulnerable

The population reduction over any 105 to 150 year period, including both past and future (up to 100 years in the future), is estimated to be 30 to 50% (midpoint 40%), based on (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			

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Evidence:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 12,276 km² and the Area of Occupancy (AoO) is estimated to be 256 km², but other thresholds under this criterion have not been met.

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 insufficient evidence to determine 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 D2 as Vulnerable

The taxon is estimated to be very restricted. The taxon has a restricted distribution, occurring in 2 locations, such that this restriction makes the taxon capable of becoming Critically Endangered or Extinct within a time frame of one or two generations. This is in response to the impact of the identified long-term threats, notably incremental habitat loss, increasing fire risk, and climatic drying and warming.

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/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf

VicFlora (2019a). Flora of Victoria, Royal Botanic Gardens Victoria. *Lomandra micrantha* subsp. *tuberculata.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/10e18018-ea9b-4b05-8ba5-5d623edf0778

VicFlora (2019b). Flora of Victoria, Royal Botanic Gardens Victoria. *Lomandra micrantha.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/a1ff560b-f974-462f-a95c-47e2f35ef8cd