



Machaerina laxa Lax Twig-sedge

Taxonomy

Machaerina laxa (Nees) T. Koyama

This was previously known as *Baumea laxa* (Nees) Boeck. It is close to, and perhaps better treated as a subspecies of *M. preissii* Nees from Western Australia (VicFlora 2020).

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria A2bce+4ce; B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

Machaerina laxa is a slender tufted perennial with short rhizome. Culms rigid, subterete to biconvex, nodeless, striate, glabrous, smooth, 20–55 cm high, 1–2 mm diam. Leaves basal; blade flattened, shorter and broader than culms, to 2.5(–4.5) mm wide; sheath straw-coloured, dull. Inflorescence oblong in outline, loose, with distant drooping branches to c. 20 cm long, 15–30 cm long, 1–2.5 cm diam.; lowest involucral bract much shorter than inflorescence. Spikelets rather few, 3–5-flowered, 4–5 mm long; glumes 4 or 5, acute, red-brown, smooth or minutely scabrous, margins with scattered cilia; fertile glumes 2.5–4.5 mm long. Nut obovoid, coarsely reticulate, strongly 3-ribbed, the ribs somewhat winged, smooth between the ribs, white-hispid at very apex, ± shining, straw-coloured to red-brown, 1.8–3.0 mm long, c. 1 mm diam. Flowers in spring (VicFlora 2020). Long-lived, rhizomatous, monoecious. Resprouting post-fire and reproducing only by seed. Breeding system unknown, i.e. whether self-fertile or an obligate outbreeder. Flowers bisexual, wind pollinated; gene-flow via pollen potentially over considerable distances (100s of metres). Recruitment continuous but with a post-fire pulse. Seed ripens c. 3 months after pollination.

Generation Length

The generation length of *M. laxa* is suspected to be 20 to 50 years, based on its considerable longevity and continuous recruitment mode.

Distribution

M. laxa is confined to a few sites in the south-west (Portland-Nelson area, Port Campbell National Park) and the northern part of Wilsons Promontory south-western Victoria from west of the Otway Ranges to near the SA border, and Wilsons Promontory (Vicflora 2020).

Habitat

The taxon occurs in at least seasonally wet sandy soils in heathlands and heathy swamps, and more fertile soils in *Leptospermum lanigerum* Swamp Scrub.

Threats

Threats include climate change (decreased rainfall, increased evaporation, extreme temperatures); increased frequency and intensity of fire; inappropriate timing of prescribed fire (winter-spring); drying and destruction of wetlands by forest plantation use of groundwater and canopy interception of precipitation; weed invasion; and grazing and pugging of wetlands by cattle.

Altered hydrology may pose a threat in catchments subject to plantation operations, although the degree to which plantations impact on hydrology due to potentially elevated rates evapo-transpiration has not been determined for all areas or forest types.

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 60 to 150 years is suspected to be 60 to 70%, based on (b), (c) and (e) above.

Past reduction of the taxon's population is based on the suite of threats operating and the extreme historic loss of habitat to agriculture.

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 60 to 10 years is suspected to be 30 to 40%, based on (c) and (e) above.

Future reduction of the taxon's population is based on the projected impacts of the suite of threats operating, particularly climate change modifications to wetlands, and weed invasion.

Eligible under Criterion A4 as Endangered

The population reduction over any 60 to 150 year period, including both past and future (up to 100 years in the future) is suspected to be 40 to 50%, based on (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 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 112 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is inferred to be severely fragmented naturally at the subregional scale and anthropogenically at the landscape scale at separations that are likely to exceed the dispersal range of the taxon.

The main threats to the taxon (i.e. fire, climatic drying and warming, habitat loss and fragmentation, weed invasion, fungal pathogens and extreme drought stress) have a non-reversible impact on the individuals of the taxon and occur in a stochastic manner, and have the potential over time to threaten the majority of individuals in the geographic area. There is considered to be one such area, so there is considered to be one location.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

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 <u>C1</u> or <u>C2</u>				
<u>C1</u>	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)
<u>C2</u>	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

There is insufficient evidence to support an estimate of total population size.

Criterion D. Very small or restricted population				
		Critically Endangered	Endangered	Vulnerable
Number of mature individuals		< 50	< 250	<u>D1</u> < 1,000
<u>D2</u>	<i>Only applies to the VU category</i> 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.	-	-	<u>D2</u> . Typically: <u>AoO</u> < 20 km ² or number of locations ≤ 5

Evidence:

Ineligible under Criterion D

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

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