Threatened Species Assessment

Schoenus melanostachys
Black Bog-sedge

Taxonomy

Schoenus melanostachys R. Br.

Current conservation status

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

Proposed conservation status

Vulnerable in Victoria

Criterion D2

Species Information

Description and Life History

The taxon is a robust, tufted, perennial sedge with a short stout rhizome. Culms erect to weeping, rigid, terete, striate, nodeless, 30-125 cm high, 1.3-2.5 mm diam. Leaves with short obtuse blade to 0.5 cm long; sheath very dark red-brown to blackish, finely scabrous, dull or glistening; mouth villous; ligule present as narrow line. Inflorescence narrow, erect or drooping, 4-20 cm long, with spikelets clustered at 4-7 nodes; lowest involucral bract to 0.3 cm long. Spikelets narrow-ovate, acute, 1-3-flowered, 4-10 mm long; glumes 7-11, the lowest 4-6 empty, acute, dark red-brown to blackish, dull or glistening, with woolly or ciliate margins; fertile glumes 4-7 mm long; hypogynous bristles 0-5, not plumose, shorter than nut. Nut trigonous, ellipsoid, scarcely 3-ribbed, transversely wrinkled, glabrous, dull, pale red-brown, 1.5-1.7 mm long, c. 0.8 mm diam. The taxon flowers from Spring to Summer (VicFlora 2017).

Generation Length

The generation length of *Schoenus melanostachys* is estimated to be 50 to 75 years based on a potentially indefinite longevity. The taxon is inferred to resprout successfully from the subterranean rhizome following all but the most intense fire events. Recruitment is likely to be both episodic following rare fire events and opportunistic in response to localised site disturbance events.

Distribution

The taxon is restricted, in Victoria, to far East Gippsland, from about Cann River eastwards to the New South Wales border. It is reliably recorded from Tonghi Plain and the lower reaches of the Cann River Valley east to the New South Wales border and inland to Beehive Creek Falls in the Coopracambra National Park. A Beauglehole list record in the headwaters of the Yeerung River east of Cabbage Tree Creek, whilst plausible, is not supported by any specimen in the Australasian Virtual Herbarium.

The taxon also occurs in Queensland, New South Wales, and Borneo (VicFlora 2017).

Habitat

The taxon occurs in damp areas fringing springs and watercourses, often openings in near-coastal or lowland forest (VicFlora 2017). It is often found in wet or waterlogged soils in heathy woodlands or sedgelands in which it can be locally dominant, from sea level to elevations of 280 m. At the inland limit at Beehive Creek Falls the taxon

is recorded in peaty sand on granite above the falls. On the Upper Genoa River, the taxon is recorded in wet crevices in sandstone rocks on the riverbank.

Threats

The taxon is unlikely to have suffered significant historic habitat loss to agriculture or habitat modification to forestry activity since almost all site and specimen records are on public land and the taxon is associated with sites of low nutrient status unsuitable for agriculture and in habitats of little or no commercial value for timber production.

Current and future threats include climatic drying and warming which, together with imposed anthropogenic fire regimes, are projected to increase the risk of intense and repeat fire events. Intense fire has the capacity to consume peaty organic substrates, thus destroying the tough rhizome of the taxon. Repeat fire at intervals approaching the tolerable fire interval for the taxon thus have the capacity to eliminate recruiting stands permanently with little opportunity for recolonisation since the taxon has no mechanism for long-distance dispersal.

Climatic drying and logging of surrounding forests also increase the risk of lowering water tables and drying out of wetland habitats, resulting in a contraction in the local extent of suitable habitat. Recurrent logging maintains forests in upslope catchments in permanently young age classes with well-documented declines in downstream water availability. Some wetlands are also threatened by pugging and wallowing by Sambar Deer which are currently experiencing a population explosion throughout the far East Gippsland region. The habitat of the taxon is also susceptible to destructive excavation by feral pigs which are also common throughout the region.

The habitat of the taxon is at low risk of weed invasion on account of its low nutrient status.

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:

Ineligible under Criterion A

The past population reduction does not meet the threshold for eligibility under criterion A2. Future decline (Criterion A3) cannot be estimated with any confidence since the identified threats operate incrementally or stochastically and with unpredictable intensity.

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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 2,866 km² and the Area of Occupancy (AoO) is estimated to be 347 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 no available estimate of population size for the taxon in Victoria although field observations suggest it is likely to exceed 1000 mature individuals since representative stands are likely to comprise at least ten mature individuals and the number of discrete occurrences is estimated at 100-150.

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. It has a restricted distribution, with one location, such that this restriction makes it capable of becoming Critically Endangered or Extinct with a time period of one or two generations, because of the effects of the identified threats, notably climatic drying and warming which, together with imposed anthropogenic fire regimes, are projected to increase the risk of intense and repeat fire events.

A single location is based on the identified threats which are projected to operate consistently across the restricted ecological and geographic range of the taxon in Victoria.

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). Flora of Victoria, Royal Botanic Gardens Victoria: *Schoenus melanostachys*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/80ba190f-821b-4155-947c-86e28cd8faf0