Threatened Species Assessment

Sorghum leiocladum
Wild Sorghum

Taxonomy

Sorghum leiocladum (Hack.) C.E. Hubb.

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria B1ab(iii)+2ab(iii)

The bushfires of 2019/2020 are believed to have impacted more than 50% of the taxon's modelled habitat. The overall impacts of the fire are yet to be determined, and the taxon's recovery depends on effective control of the impacts of feral herbivores and prevention of major soil and vegetation disturbance because of fire recovery activities.

Species Information

Description and Life History

The taxon is a tufted or shortly rhizomatous perennial, culms erect, to c. 1 m high, hairs at nodes white, spreading, c. 4 mm long. Leaves with scattered hairs; blade flat, to c. 40 cm long and 3 cm wide, scabrous along margins, midrib much thickened; ligule membranous, c. 2 mm long, glabrous, but surrounded by silky hairs c. 3 mm long. Inflorescence a slender panicle 10-20 cm long, of 8-20 pedunculate racemes, mostly c. 2 cm long; pedicellate spikelets male only, c. 5 mm long, purplish, falling before bisexual spikelets; bisexual spikelets to 7 mm long; glumes covered with tawny hairs in lower part, scabrous above, becoming hardened and shining dark brown at maturity; sterile lemma thinly membranous, slightly shorter than glumes; fertile lemma about half as long as sterile one, thinly membranous, broadly notched at apex, with once or twice bent, twisted awn c. 2 cm long attached at base of notch; palea rudimentary or absent. The taxon flowers from January to March (VicFlora 2019).

Generation Length

The generation length of *Sorghum leiocladum* is estimated to be 15 to 20 years and is based on a plausible longevity of 10-15 (-20) years. Recruitment is likely to be sporadic to close to continuous.

Distribution

In Victoria, the taxon occurs in the Buchan-Murrindal area. It was formerly recorded from the upper Snowy River and Ingeegoodbee, but it has not been noted from these localities since 1940. The taxon also occurs in Queensland and New South Wales (VicFlora 2019).

Habitat

In Victoria, the taxon is confined to grassland and grassy woodlands of rain-shadow areas, on dark loamy soils derived from limestone (VicFlora 2019).

Threats

The taxon is inferred to have suffered severe historic decline through habitat loss to agriculture at least in the Buchan district and continuing habitat degradation in response to weed invasion and the impact of exotic herbivores, including stock, rabbits, and hares.

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

There is insufficient evidence to determine whether there has been or will be a reduction in population sufficient to meet any threshold for Criterion A.

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 B1 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 110 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the subregional scale and anthropogenically at the landscape scale, at least in the Buchan district. Geographically discrete occurrences are separated at distances likely to exceed the dispersal range of the taxon, which has no specialised mechanism for long-distance dispersal.

It is estimated to have 2 locations. It has a continuing decline in (iii) above, based on the current and projected impact of the identified threats.

The taxon is severely

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 20 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, the taxon is estimated to be severely fragmented, is estimated to have 2 locations and has a continuing decline in (iii) 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 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. It has a restricted distribution, with an AoO of 20 km2 and two locations, 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, **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 (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Sorghum leiocladum*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/b1392c77-6b10-4a26-b488-6f04d1b8cbba