Threatened Species Assessment

Echinopogon caespitosus var. *caespitosus*
Bushy Hedgehog-grass

Taxonomy

Echinopogon caespitosus var. *caespitosus* C.E. Hubb.

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria B1ab(i,ii,v)+2ab(i,ii,v)

Species Information

Description and Life History

The taxon is a tufted perennial, culms 2-4 noded, erect, to 1 m high, smooth to minutely scabrous. Leaves slightly scabrous, glabrous to lightly pubescent; blade flat, to 15 cm long and 5 mm wide; ligule firmly membranous, 0.5-1.5 mm long. Inflorescence an ovoid to oblong panicle, 2-8 cm long (excluding awns), often interrupted, narrowly oblong prior to anthesis. Spikelets as for E. ovatus; glumes subequal, acute, 2.5-4 mm long, long-scabrous along the keels; lemma (including apical lobes 0.5-1 mm long) equal to or slightly exceeding glumes, callus hairs dense, c. 1 mm long; awn 7-16 mm long. The taxon flowers from October to December (VicFlora, 2015).

Generation Length

The generation length of *Echinopogon caespitosus* var. *caespitosus* is suspected to be 15 to 20 years. The longevity is plausibly 30 years; this seems to be a credible estimate of potential longevity for a tufted perennial tussock grass. Reproductive maturity would be reached within the first two years.

Distribution

The taxon is recorded in Victoria from only the Heyfield-Bairnsdale area and in the vicinity of Mallacoota, but it is probably more widespread in the east (VicFlora, 2015).

Habitat

The taxon occurs in dryish lowland forest sites (VicFlora, 2015).

Threats

Threats to this taxon include climate change (i.e., decreased rainfall), soil loss on bare, post-fire substrates resulting from severe rainfall events, weed invasion, grazing and browsing by domestic stock and feral animals (i.e., cattle, deer, goats, rabbits) and, potentially, kangaroos.

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 3,528 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented, being known from a range of scattered sites, including disjunct patches of remnant vegetation on the Gippsland Plains.

It is estimated to have 3 locations based on landscape context and regional differences in local climate and associated vegetation; one for all occurrences in highly fragmented rural landscapes in the Heyfield-Bairnsdale region, one for occurrences in larger stands of native vegetation such as Providence Ponds Flora and Fauna Reserve (FFR), Moormurng FFR, Mitchell River National Park, and one for the isolated occurrence at the Spotted Dog Mine, east of Mallacoota Inlet.

It has a continuing decline in (i), (ii) and (v) above due to the identified threats, particularly on the Gippsland Plains and fringing relatively fertile foothills. While populations in forested areas of the hills to the north of the plains would appear less vulnerable to the impacts of weed invasions, information from which to assess the security (or otherwise) of these occurrences is unavailable.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 116 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has 3 locations and has a continuing decline in (i), (ii) 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 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	< 50	< 250	D1 < 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:

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

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014.* Department of Environment and Primary Industries, Melbourne.

VicFlora (2015). Flora of Victoria: *Echinopogon caespitosus* var. *caespitosus*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/04c36966-61cc-488a-977e-6f222344145f