Threatened Species Assessment

Deschampsia cespitosa
Tufted Hair-grass

Taxonomy

Deschampsia cespitosa (L.) P. Beauv.

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 A3ce; B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a tufted glabrous perennial, culms erect, to 150 cm high. Leaves glabrous; blade inrolled or flat, smooth on the lower surface, scabrous above, to 50 cm long and 4 mm wide; ligule firm, acute, 3-10 mm long. Inflorescence an open or contracted panicle, 8-30 cm long. Spikelets 2-(rarely 3)-flowered, 3.5-6 mm long, shining; glumes lanceolate, 3-4 mm long, usually purplish; lemma oblong, 3-4.5 mm long, membranous, erose at apex, callus hairs c. 1 mm long; awn straight, inserted halfway down lemma or lower, shortly exceeding lemma apex, rarely about as long as lemma; rachilla bristle plumose, slightly shorter than upper lemma. The taxon flowers from September to February (VicFlora, 2015).

Generation Length

The generation length of *Deschampsia cespitosa* is estimated to be 30 years. Generation length is based on an estimated longevity of at least 20 years or more, and the observation that the taxon can resprout annually from a persistent rootstock. The taxon has a low tolerance of competition and is likely to recruit opportunistically in response to seasonal inundation and other localised site disturbance events which create canopy gaps and receptive soil conditions for germination.

Distribution

The taxon is widely distributed throughout the world. In Victoria, the taxon is confined to the eastern alps (e.g., Bennison, Bogong, Dargo and Nunniong Plains, Omeo district), with disjunct lowland occurrences near Woodend, Colac, and Dartmoor in the far south-west. A 1905 specimen at MEL labelled 'Sandringham' is of dubious origin. The taxon is also found in South Australia (SA), New South Wales (NSW), Tasmania and New Zealand (VicFlora, 2015).

Habitat

The taxon is largely confined to damp, peaty sites at both low and high elevations. In the Victorian Alps, it is an uncommon grass of damp to wet alpine or subalpine grasslands (VicFlora, 2015). Specifically, the taxon is a habitat specialist in seasonally inundated pools. Although typically terrestrial, the taxon can tolerate inundation by shallow water, often occupying broad stream beds with shallow water pavements that have low flow rates. Although perennial, the taxon is not tussock-forming.

Threats

The taxon is a habitat specialist dependent on the hydrological stability of its wetland habitat. Key threats to the hydrology of this habitat include climatic drying, increasing frequency, intensity and landscape scale of bushfire in response to climate change, wetland drainage in lowland sites, pugging and browsing by exotic herbivores including domestic stock, feral horses, Sambar Deer and feral pigs and weed invasion.

Weed invasion is a significant threat, given that the taxon has a low tolerance of competition. Drying of wetland habitats also increases competition from native forbs, other graminoids, shrubs and trees. At a site south-east of Barongarook in the northern Otways, for example, the taxon was recorded in a swamp dominated by *Lepidosperma longitudinale*, but drying and invaded by, for example, *Eucalyptus ovata* and *Leptospermum scoparium* in 2010. Fire can destroy peaty substrates in both alpine and lowlands bogs and swamps, particularly those dominated by *Sphagnum*, permanently eliminating the habitat of stands at these sites.

The bushfires of 2019/2020 are believed to have impacted around 18% of the taxon's habitat. The overall impacts of the fire are yet to be determined. The taxon is likely to be threatened by feral herbivores, notably Sambar Deer and soil and vegetation disturbance as a result of fire recovery activities (e.g., machinery impacts, removal of hazardous trees). Drought, hot weather and repeat fires have the potential to damage or destroy recovering plants and/or seedlings.

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 A3 as Endangered

The population reduction over the next 90 years is projected to be 50 to 75%, based on (c) and (e) above.

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

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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 88 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented naturally at the regional and landscape scales, and potentially also anthropogenically at the landscape scale in lowland districts. Geographically discrete occurrences are isolated from each other at separations exceeding the localised dispersal range of the taxon, which has no specialised mechanism for long-distance dispersal. Localised dispersal by animal vectors, wind or water is likely to be at the metre to kilometre scale only, and rarely extend beyond the local sub-catchment unit. This precludes the possibility of recolonisation in the event of local extinction

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

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

Although there is no available estimate of population size for the taxon, it is likely to be in the thousands since an estimated 1000 plants were recorded at a single site on the Howitt Plain in 2015.

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.

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, Royal Botanic Gardens: *Deschampsia cespitosa*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/dc81dd60-010c-4c38-82e6-a2e327be2c70