Threatened Species Assessment

Carex alsophila
Forest Sedge

Taxonomy

Carex alsophila F. Muell.

Current conservation status

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

Proposed conservation status

Endangered in Australia

Criteria B1ab(iii)+2ab(iii)

Species Information

Description and Life History

The rhizome is short; shoots are densely tufted. Culms erect, triquetrous, smooth or scabrous, 30-45 cm long, 1.5-2.5 mm diam. Leaves exceeding culms, to 10 mm wide, septate-nodulose (obvious when dried); sheath pale brown, often tinged red-brown; ligule acute. Inflorescence narrow, erect, 17-20 cm long, with spikes solitary at nodes; lowest involucral bracts exceeding inflorescence. Spikes sessile or short-pedunculate, distant, erect to spreading at maturity, 3-5 cm long; upper 1-4 spikes entirely male or rarely uppermost spike with female flowers above; lower spikes entirely female or with male flowers above; male glumes obtuse, hyaline and erose, pale brown, often tinged red-brown; female glumes acuminate to obtuse, often shortly mucronate, green tinged red-brown, with irregularly hyaline margins, 4-6 mm long; utricles 4-6 mm long, 1.5-2 mm diam., ovoid, strongly but irregularly few-nerved, glabrous, green, with beak 0.7-1.5 mm long, with apex notched or bifid and often minutely hispid; style 3-fid. Nut obovoid, trigonous, pale yellow. The taxon flowers in summer (VicFlora 2018).

Generation Length

The generation length of *Carex alsophila* is inferred to be 4 to 20 years. This is based on the generation length of some native cultivated congeners.

Distribution

The taxon is endemic to Victoria, between Gembrook, Alexandra and Erica, but is locally rather common. At MEL there are only 14 post-1946 collections, but the taxon appears to be under-collected as indicated by 120 records in the Atlas of Living Australia.

Habitat

The taxon grows in mountain gullies, near streams and in swamps. It has been collected near streams in *Nothofagus* and *Eucalyptus delegatensis* forest with shrubby understorey and ferns. It is also found in subalpine wet heath, *Melaleuca squarrosa* riparian scrub with *Gahnia grandis* abundant, and in a roadside drain in *E. delegatensis* forest.

Threats

The taxon is potentially susceptible to climatic drying, and any disruption to hydrology of wetlands and streams.

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, and the future population reduction does not meet the threshold for eligibility under criterion A3.

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

It is inferred to have 5 locations. It has a continuing decline in (iii) above.

The taxon is subject to continuing decline in habitat quality due to the identified threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 5 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is inferred to have 5 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

It is inferred that there are 2,000 to 20,000 mature individuals, but other thresholds under this criterion have not been met.

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. Retrieved from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf

VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Carex Alsophila.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/cf263398-9bac-4147-a6ea-0b87d71894f8