Threatened Species Assessment

Cladium procerum
Leafy Twig-sedge

Taxonomy

Cladium procerum S.T. Blake

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 A2bce; B2ab(ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a tall, rhizomatous perennial, often forming extensive clumps. Culms ± terete, smooth, glabrous, 1-2.5 m high, 5-10 mm diam., often branching extravaginally at nodes. Leaf-blades to 2.5 m long, 5-20 mm wide; sheaths yellow-brown at base. Inflorescence loose, interrupted-oblong in outline, 18-35 cm long, 6-9 cm diam.; involucral bracts longer than inflorescence. Spikelets often with only the lower flower bisexual, 3-5 mm long; glumes 5 or 6, obtuse to acute, red-brown, glabrous, about 4 lowest empty, shorter than fertile glumes, which are 3.5-4.0 mm long; style 3-fid; style-base inconspicuous at maturity. Nut ellipsoid to ovoid, glabrous, smooth, shining, mid-brown, 2.0-2.5 mm long, 1.3-2 mm diam., with basal disk inconspicuous and often remaining with spikelet. The taxon flowers from spring to summer (VicFlora, 2019).

Generation Length

The generation length of *Cladium procerum* is suspected to be 50 to 100 years. The taxon is suspected to reach reproductive maturity within four or five years, if not sooner. The plant is a long-lived rhizomatous perennial, often forming extensive clumps. Consequently, a long effective generation length is suspected and it is likely the above figure is quite conservative.

Distribution

The taxon has a scattered distribution across near-coastal areas of southern Victoria (VicFlora, 2019).

Habitat

The taxon occurs on swampy areas and margins of streams and lakes near the coast, tolerating low to moderate levels of salinity (VicFlora, 2019).

Threats

Threats to the taxon variously include climate change (i.e., decreased rainfall, extreme rainfall events causing flash floods and/or excessively prolonged flooding, soil erosion, and/or severe scouring of riparian environments, drying of springs and soaks, fire (i.e., increased frequency and intensity), sea-level rise (coastal erosion), and eutrophication 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:

Eligible under Criterion A2 as Endangered

The population reduction over the past 150 to 300 years is suspected to be 30 to 50%, based on (b), (c) and (e) above.

Given the generalised impacts on wetlands and riparian zones, historic population reductions can be presumed to have occurred. However, there is inadequate information on which to base a reliable estimate. Given the extent of habitat modification on calcareous soils (in particular to swamp scrubs, and high impacts in a number of coastal areas), the extent of historical population loss may well be in the 30-50% range.

The causes of the reduction may not have ceased, be understood or be reversible.

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 228 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, as it is known from very restricted areas of suitable habitat across a number of dispersed localities.

It is suspected to have 2 locations, as in general terms, the near-coastal riparian and inland wetland populations are each subject to different sets of threats.

It has a continuing decline in (ii), (iii), (iv) and (v) above. Ongoing incremental losses in population size, range, and quality of habitat can be anticipated, particularly due to modification of near coastal riparian habitats.

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:

Ineligible under Criterion D as Data Deficient

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. 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 (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Cladium procerum.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/6df147dc-33a5-47b5-8639-8c84c05699fc