Threatened Species Assessment

Eleocharis plana
Flat Spike-sedge

Taxonomy

Eleocharis plana S.T. Blake

The taxon is very close to *E. acuta*, differing most obviously in the naturally flattened culms (VicFlora, 2016).

Current conservation status

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

Proposed conservation status

Critically Endangered in Victoria

Criteria A2c+4c

Species Information

Description and Life History

The taxon is a perennial with creeping rhizome. Culms tufted, flat to slightly plano-convex, to 80 cm high, 2-4 mm diam. Spikelet narrow-cylindric, 10-20(-40) mm long; glumes acute, faintly keeled, margins broadly hyaline, straw-coloured, red-tinged to ± evenly dark red-brown, 3.5-4 mm long; hypogynous bristles 6-8, slender, flattened and broad at the base, retrorsely scabrous, about as long as nut; stamens 3; anthers 1.5-3.1 mm long; style 3-fid. Nut biconvex, with angles obtuse, obovoid, shining, bright yellow to dark brown, 1.2-1.8 mm long, c. 1 mm diam., external cells minute; style-base about half as long and wide as nut. The taxon flowers from spring to summer (VicFlora, 2016).

Generation Length

The generation length of *Eleocharis plana* is estimated to be 35 to 80 years. The taxon persists indefinitely as a rhizomatous clone that resprouts post-drought from its persistent subterranean rhizome. It does not require seed-based recruitment. The longevity and generation time are, therefore, indefinite.

Distribution

The taxon is known from the Terrick Terrick and Kerang areas and the lower Mitta Mitta River near Tallangatta. It also occurs in South Australia, Queensland, and New South Wales (VicFlora, 2016). It is also recorded on the Victorian Volcanic Plain to the west and north-west of Melbourne where the taxon may have its Victorian stronghold.

The taxon appears to have a naturally disjunct range, the spacings between occurrences are exacerbated by anthropogenic habitat fragmentation.

Habitat

The taxon occurs on seasonal wetlands in the north and on muddy flats of the lower Mitta Mitta River near Tallangatta (VicFlora, 2016). It is often sympatric with *Eleocharis pallens*, *E. acuta*, *E. pusilla* and *Marsilea drummondii*, typically in gilgai habitat. At Eynesbury near Melbourne, the taxon is recorded in Lignum Swamp and at Terrick Terrick the taxon is recorded around the edges of ephemeral ponds.

Threats

The taxon has experienced very significant historic decline through habitat loss to agriculture. On the Northern Plains, where the taxon occurs on Black Box gilgai plains, this habitat was widespread across the north-east Wimmera at the time of European settlement. An estimated 90% of this habitat has been cleared, for example, in the Lalbert-Kerang districts. Occurrences within the Melbourne Metropolitan Growth Corridors, which occur within the Victorian stronghold of the taxon, are threatened by continuing habitat loss to urban development. The northern floodplain habitat of the taxon is threatened by climatic drying and diversion of floodwaters for agriculture and town water supplies. Weed invasion and competition are not implicated in the historic decline of the taxon.

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 Critically Endangered

The population reduction over the past 105 to 240 years is estimated to be 80 to 90%, based on (c) above.

This is based on the very high rate of historic habitat loss to agriculture across the Victorian range of the taxon.

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

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 105 to 240 year period, including both past and future (up to 100 years in the future), is estimated to be 75 to 85%, based on (c) above. The causes of reduction may not have ceased, be understood or be reversible.

Past decline is based on the very high rate of historic habitat loss. Future decline is based on the projected impact of the identified threats, notably the continuing habitat loss within the Melbourne Metropolitan Growth Corridors which occur within the apparent Victorian stronghold of the taxon.

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 B as Endangered

The Area of Occupancy (AoO) is estimated to be 60 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

Any two of (a), (b) or (c) above are also satisfied.

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 no available estimate of population size for the taxon.

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 (2016) Flora of Victoria, Royal Botanic Gardens: *Eleocharis plana*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/0c3cb02f-ec0a-4182-a947-d87ea89e5f57