Threatened Species Assessment

Carex canescens
Short Sedge

Taxonomy

Carex canescens L.

Carex canescens is readily recognised by the soft-textured, often pale green leaves, sessile short spikes, fruiting spikes which resemble small pine cones, and the minutely colliculate utricles. It is a variable species. Australian populations are sometimes placed into the *C. canescens* subsp. *canescens*, which has a circumpolar distribution. This subspecies is itself variable, with many varieties and forms having been described in the subspecies (VicFlora, 2018).

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 B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a perennial herb with a short rhizome; shoots loosely tufted. Culms erect, trigonous, usually scabrous above, 5-30(-50) cm long, 0.7-1.3 mm diam. Leaves shorter than or equalling culms, 1.5-4 mm wide, soft-textured, pale green or mid green; sheath pale brown; ligule obtuse to rounded. Inflorescence small, erect, 1-3(-5) cm long, with 3-8 spikes solitary at nodes; lowest involucral bract shorter than inflorescence. Spikes sessile, ± contiguous, erect to spreading at maturity; spikes with female flowers above male flowers, 0.5-0.9 cm long (uppermost spike occasionally with additional female flowers at the base); glumes obtuse to acuminate, occasionally shortly mucronate, glossy hyaline, often tinged yellowish, with green or pale brown midrib (often very faint), pale yellowish green; female glumes c. 2 mm long; utricles 2-3 mm long, 1.0-1.5 mm diam., ovoid to ellipsoid, strongly several-nerved, minutely colliculate, often scabrous on margins of shoulders, pale brown or yellow brown; beak 0.2-0.5 mm long, with apex notched or shortly split abaxially, minutely scabrous; style 2-fid. Nut ovoid to ellipsoid, lenticular, pale yellow-brown. The taxon flowers in summer (VicFlora, 2018).

Generation Length

The generation length of *Carex canescens* is estimated to be 25 to 50 years, based on a plausible longevity exceeding 50 years and the inference that vegetative resprouting is likely to be as important as seed-based recruitment for population maintenance under pre-settlement conditions. The pre-settlement fire interval was probably in the 50-100 year range, with fire affecting only a mosaic proportion of plants at any one site. Seed-based recruitment is likely to be opportunistic in response to localised site disturbance events and seasonal conditions.

Distribution

The taxon is restricted in Victoria to the Alpine region where locally frequent on the Bogong High Plains (e.g., near Mt Cope) and the Baw Baw Plateau, but uncommon elsewhere in the alps (e.g., Snowy Range, Cobberas). Two unvouchered quadrat records taken by Neville Walsh in 1982 suggest the taxon also occurs at Mt Buffalo. There

are no site or specimen records to support the VicFlora (2018) claim that the taxon occurs in the Cobberas. It also occurs in NSW, Tasmania, New Guinea, Europe, Asia, North America and South America. It is the only bipolar *Carex* species with an austral distribution which is not limited to only one continent (VicFlora, 2018).

Habitat

The taxon occurs near pools and streams (VicFlora, 2018). Site and specimen data indicate that it is typically associated with *Astelia alpina* var. *novae-hollandiae* (Silver Astelia), *Baeckea gunniana* (Alpine Baeckea), *Brachyscome nivalis* (Snow Daisy), *Callistemon pityoides* (Alpine Bottlebrush), *Carex appressa* (Tall Sedge), *Carex gaudichaudiana* (Fen Sedge), *Carpha nivicola* (Broad-leaf Flower-rush), *Celmisia sericophylla* (Silky Snow-daisy), *Empodisma minus* (Spreading Rope-rush), *Epacris paludosa* (Swamp Heath),*Epilobium gunnianum* (Gunn's Willow-herb), *Luzula novae-cambriae* (Coarse Woodrush), *Olearia algida* (Mountain Daisy-bush), *Oreobolus distichus* (Fan Tuft-rush), *Oreobolus pumilio* (Alpine Tuft-rush), *Ozothamnus cupressoides* (Kerosene Bush), *Poa costiniana* (Bog Snow-grass), *Poa hothamensis* (Ledge Grass), *Psychrophila introloba* (Alpine Marsh-marigold), *Richea continentis* (Candle Heath) and *Sphagnum cristatum* (Peat Moss).

Threats

Alpine grazing of cattle on the Bogong High Plain has been a major historic threat resulting in widespread destruction of wetland habitats and facilitating exotic weed invasion. At many sites, the taxon has been observed to be heavily trampled and severely pugged by cattle. The frequent association with *Carex gaudichaudiana* (Fen Sedge), which is targeted by cattle, and consistent association with *Sphagnum cristatum* (Peat Moss), which is highly susceptible to trampling and pugging, emphasise the vulnerability of the habitat of the taxon to cattle grazing.

Although the direct impact of cattle grazing ceased with the cancellation of grazing licences throughout the Alpine National Park, with a likely recovery of the population and its habitat, the legacy of weed invasion persists. Competition with exotic weeds is not, however, the primary cause of the projected decline of the taxon.

The key current and future threat to the taxon is the long-term impact of climatic drying, coupled with increasing temperatures, leading to shrub invasion of subalpine to alpine wet heath or bog communities. The taxon is additionally threatened by imposed anthropogenic and climate-induced increases in fire frequency, intensity and landscape scale. The bushfires of 2019-2020 are believed to have impacted around 3% of the taxon's habitat. The overall impacts of the fire are yet to be determined. It may now be threatened also by Sambar Deer which, in recent years, have been observed within the habitat of the taxon across the Alpine region, where their pugging and wallowing behaviour is highly destructive.

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 4,450 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the regional and landscape scales with all geographically isolated stands occurring at separations likely to exceed the dispersal range of the taxon, which has no specialised mechanism for long-distance dispersal. Seed-bearing utricles are likely to be dispersed downstream by water within each catchment unit.

It is estimated to have 1 location. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the current and projected impact of the identified threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 108 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above the taxon is estimated to be severely fragmented, to have 1 location and has a continuing decline in (i), (ii), (iii), (iv) 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 no available population monitoring data to inform a reliable estimate of current population size.

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 canescens*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/33883335-cf23-43b6-a480-fe42deee3d26