Threatened Species Assessment

Juncus antarcticus
Cushion Rush

Taxonomy

Juncus antarcticus Hook. f.

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2003).

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

Proposed conservation status

Endangered in Victoria

Criteria A2bce+3bce+4bce; B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a dwarf, cushion-forming perennial with well-developed slender rhizomes and stolons. Culms erect, filiform, 0.5-5 cm high, shorter than to slightly exceeding the leaves, smooth. Leaves cauline, the older ones persisting and turning yellow-brown; blade spreading, channelled near base, becoming flat towards the acute to obtuse apex, linear-subulate, to c. 3 cm long and 2 mm wide, generally stiff; sheath margins tapered into the blades; auricles absent. Inflorescence a 1-5-flowered cluster, expanding to c. 3-7 mm diam. in fruit; bracts membranous, not exceeding the flowers; prophylls absent. Tepals tinged dark reddish-brown; the outer 2.7-4 mm long, acuminate; inner subequal to outer, obtuse to acuminate; stamens 3, rarely 6, anthers 0.5-1 mm long. Capsules reddish-brown in upper part, ovoid, 2-3 mm long, shortly mucronate, subequal to tepals; seeds 0.4-0.5 mm long, with very fine longitudinal and transverse ridges discernible only at high magnification, minutely apiculate at one or both ends. Flowers and fruits recorded in January (VicFlora, 2019).

Generation Length

The generation length of *Juncus antarcticus* is suspected to be 150 to 200 years. It has been suspected that this plant was a tufted perennial, but not rhizomatous (VicFlora, 2015). This tiny plant forms clonal patches in short alpine herbfield. The growing season in this habitat is extremely short-growing season. Past estimates suggest a similar generation length to that of *Juncus falcatus*, for which a generation turnover of 150-200 years or more has been assumed.

Distribution

The taxon is restricted in Victoria to the Bogong High Plains and is uncommon (VicFlora, 2019).

Habitat

The taxon occurs on late-lying snowpatches and the margins of bogs and creeks in alpine short herbfield (VicFlora, 2019).

Threats

Threats to this taxon include the impacts of climate change (i.e., decreased rainfall and decreased snowfall, drying of springs and soaks), post-fire deposition of veneers of silt along drainage lines and, potentially, soil disturbance by feral animals (horses, deer), humans and previously, cattle.

Long-term drying out is also likely to result in grass dominance and ultimately shrub encroachment, although the relevant sites are gravelly or rocky.

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 450 to 600 years is suspected to be 30 to 50%, based on (b), (c) and (e) above.

Past decline is based on the early impacts of the identified threats. The causes of the reduction may not have ceased, be understood or be reversible.

Eligible under Criterion A3 as Endangered

The population reduction over the next 100 years is suspected to be 30 to 50%, based on (b), (c) and (e) above. Future decline is based on the early impacts of the identified threats, which are projected to increase in intensity in the future.

Eligible under Criterion A4 as Endangered

The population reduction over any 450 to 600 year period, including both past and future, is suspected to be 30 to 50%, based on (b), (c) and (e) above. The causes of 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 B1 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 305 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is inferred to be severely fragmented. The taxon is restricted to very small and scattered patches of suitable habitat, with geographically isolated occurrences situated at separations typically exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal.

It has a continuing decline in (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 60 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, the taxon is inferred to be severely fragmented and has a continuing decline in (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 insufficient evidence to determine the number of mature individuals. Counts of some populations have been made (e.g., in the Cope Creek area), but numbers for the total population are not available. Very large numbers of individual shoots of this tiny plant can occur within small patches of dwarf herbfield, however, the actual number of genets is likely to be quite small in comparison.

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 suspected 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.

SAC (2003). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 656 *Juncus antarcticus*

VicFlora (2019). Flora of Victoria, Flora of Victoria: *Juncus antarcticus.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/1db5a19f-cbd9-47d9-b76d-d6d8eb299890