Threatened Species Assessment

Juncus psammophilus
Sand Rush

Taxonomy

Juncus psammophilus L.A.S. Johnson

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criterion B2ab(iii,v)

Species Information

Description and Life History

The taxon is a densely tufted dioecious perennial with horizontal or ascending rhizomes. Cataphylls pinkish-brown to dark brown towards the base, to c. 30 cm long. Culms ± bright green, easily compressed, 65-200 cm high and 1.5-3.5(-4) mm diam.; striations 75-120, crowded and not strongly raised; pith often interrupted throughout or in part (sometimes only towards base), cobwebby in upper part; stomates sunken in pits. Inflorescence loose, many-flowered, flowers scattered along fine ± slightly flexuose branchlets; primary bract continuous with culm, to c. 40 cm long; prophylls present. Tepals stramineous or occasionally faintly reddish-tinged, 1.8-2.8 mm long in male flowers, 1.3-2.2 mm in female flowers; stamens 6, anthers c. 0.7-1 mm long, reduced to staminodes in female flowers. Capsules equal to or slightly longer or shorter than the tepals, stramineous to golden-brown, 1.5-2 mm long. The taxon flowers recorded in December, seeds probably shed from January to April (VicFlora, 2019).

Generation Length

The generation length of *Juncus psammophilus* is suspected to be 10 to 20 years. This taxon is a shortly-rhizomatous, tufted rush. It is suspected that individual plants may have a potential longevity of 15-25 years. Plants of some other medium-sized *Juncus* species reach reproductive maturity within the first two years. Populations of this taxon can be locally relatively dense. Given the apparent stability of sites and potentially high local density of population, an appropriate generation length is suspected to be around 10-20 years.

Distribution

The taxon is rare in Victoria, mainly recorded from the central parts of northern Victoria (VicFlora, 2019).

Habitat

The taxon is confined to *Eucalyptus camaldulensis* or sometimes *E. microcarpa* woodlands along the sandy or silty banks of streams or in seasonal swamps and depressions. Although rare, it may be locally dominant (VicFlora, 2019).

Threats

Threats to the taxon include climate change (i.e. decreased rainfall and associated impacts on riparian habitats), gullying of streamlines, eutrophication of habitats, clearing of remnant habitat, weed invasion (e.g. by *Phalaris aquatica*), and grazing by domestic stock.

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.

While large historic reductions are likely, it is more difficult to estimate additional and more recent impacts on the taxon, given that records are typically from public land sites. It seems unlikely that the three generation past reduction would exceed 30%. It is difficult to project the impacts of threats, such as climate change and weed invasion, over the relevant period. The taxon is, to an extent, conservation dependant.

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 Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 5169 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is inferred to be severely fragmented. The taxon is known from localised patches of remnant habitat at number of dispersed localities, with a distribution that is presumed to be both naturally and anthropogenically fragmented due to land clearance. Geographically isolated occurrences situated at separations typically exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal.

Occurrences in small reserves along minor drainage lines would appear to be subject to different levels of threats compared to those associated with the verges of more substantial watercourses (Campaspe and Goulburn Rivers). Therefore, the taxon is considered to have two locations.

It has a continuing decline in (iii) 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 68 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has 2 locations and has a continuing decline in (iii) 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. Relevant population data are unavailable.

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. 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: *Juncus psammophilus*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/00281f4b-d52f-4f58-b1cc-972a5d88719a