

## *Schoenus imberbis* Beardless Bog-sedge

### Taxonomy

*Schoenus imberbis* R. Br.

### Current conservation status

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

### Proposed conservation status

Vulnerable in Victoria

Criterion D2

### Species Information

#### Description and Life History

The taxon is a tufted perennial sedge. Culms erect, rigid, terete, grooved, smooth, nodeless, 8-35 cm high, 0.5-0.8 mm diam. Leaves with blade to 1 cm long; sheath straw-coloured above, red-brown at base, papillose, dull; mouth glabrous or sparsely and minutely ciliate; ligule present. Inflorescence obconical, with 1 cluster of 8-25 spikelets, 0.5-1.5 cm long; lowest involucral bract to 2.5 cm long. Spikelets narrow-ovate to linear, acute, 1-2-flowered, 4-8 mm long; glumes 5-7, lowest 3-5 empty, acute, dark red-brown to blackish above, straw-coloured near base, dull, with minutely woolly to glabrous margins; fertile glumes 4-5 mm long; hypogynous bristles absent. Nut trigonous, obovoid, scarcely 3-ribbed, wrinkled, papillose, glabrous, glistening, straw-coloured to red-brown often with darker patches, 1.3-1.5 mm long, c. 1.0 mm diam. The taxon flowers from Spring to Summer (VicFlora 2018).

#### Generation Length

The generation length of *Schoenus imberbis* is estimated to be 35 to 50 years based on a plausible longevity of 25-50 years and the likely ability of the plant to resprout following at least mild fire events. Recruitment is likely to be both episodic following fire events and opportunistic in response to localised site disturbance events.

#### Distribution


The taxon is restricted, in Victoria, to coastal districts in Central and East Gippsland, eastward from about Sale. It also occurs in New South Wales (VicFlora 2018).

The taxon is highly disjunct and localised in Victoria, with a small concentration of records between the Gippsland Lakes and Lake Reeve and another small concentration of records between Wingan Inlet and Betka River near Mallacoota, with an isolated occurrence between the Howe Range and the New South Wales border.

#### Habitat

The taxon is occasional in near-coastal heathland and woodland (VicFlora 2018).

Site and specimen data suggests the habitat range of the taxon in Victoria includes Banksia Woodland on siliceous marine sands in the Gippsland Lakes area and coastal heath on damp sandy to peaty loams in East Gippsland. Near Loch Sport in the Gippsland Lakes area the taxon is associated with *Allocasuarina misera* (Slender Sheoak), *Banksia serrata* (Saw Banksia), *Calytrix tetragona* (Common Fringe-myrtle), *Eucalyptus arenicola* (Gippsland



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Lakes Peppermint), *Hypolaena fastigiata* (Tassel Rope-rush), *Leptospermum myrsinoides* (Heath Tea-tree), *Thryptomene micrantha* (Ribbed Thryptomene) and *Xanthorrhoea australis* (Austral Grass-tree).

In East Gippsland the taxon is associated with *Allocasuarina paludosa* (Scrub Sheoak), *Banksia marginata* (Silver Banksia), *B. serrata* (Saw Banksia), *Corymbia gummiifera* (Red Bloodwood), *Empodisma minus* (Spreading Rope-rush), *Gompholobium huegelii* (Common Wedge-pea), *Hypolaena fastigiata* (Tassel Rope-rush), *Leptocarpus tenax* (Slender Twine-rush), *Leptospermum continentale* (Prickly Tea-tree), *Spyridium parvifolium* (Dusty Miller) and *Xanthorrhoea resinosa* (Spear Grass-tree).

## Threats

The taxon is unlikely to have suffered significant historic habitat loss to agriculture or habitat modification to forestry activity since almost all site and specimen records are on public land and the taxon is associated with sites of low nutrient status unsuitable for agriculture and in habitats of no commercial value for timber production. The taxon is likely to have suffered some habitat loss to coastal development near Loch Sport in the Gippsland Lakes area and potentially also near Mallacoota in far East Gippsland.

Current and future threats include climatic drying and warming which, together with imposed anthropogenic fire regimes, are projected to increase the risk of intense and repeat fire events. Intense fire has the capacity to consume peaty organic substrates, thus destroying the shortly rhizomic rootstock of the taxon. Repeat fire at intervals approaching the tolerable fire interval for the taxon thus have the capacity to eliminate recruiting stands permanently with little opportunity for recolonisation since the taxon has no mechanism for long-distance dispersal.

Some peaty heathland sites in far East Gippsland may also be threatened by pugging and wallowing by Sambar Deer, which are currently experiencing a population explosion throughout the far East Gippsland region, and potentially also by Hog Deer. The habitat of the taxon, particularly in East Gippsland, may also be susceptible to destructive excavation by feral pigs, which are also common throughout the region.

The habitat of the taxon is at low risk of weed invasion on account of its low nutrient status.

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## 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%

<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>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.</p> <p>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]</p> <p>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.</p>	<p>based on any of the following:</p>	<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>
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## Evidence:

### Ineligible under Criterion A

The past population reduction does not meet the threshold for eligibility under criterion A2. Future decline (criterion A3) cannot be estimated with any confidence since the identified threats operate incrementally or stochastically and with unpredictable intensity.

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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 km <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
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:

#### Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 3,762 km<sup>2</sup> and the Area of Occupancy (AoO) is estimated to be 60 km<sup>2</sup>, but other thresholds under this criterion have not been met.

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 <u>C1</u> or <u>C2</u>				
<u>C1</u>	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)
<u>C2</u>	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				

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## 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 km <sup>2</sup> or number of locations ≤ 5

## Evidence:

### Eligible under Criterion D2 as Vulnerable

The taxon is estimated to be very restricted. It has a restricted distribution, with two locations, such that this restriction makes it capable of becoming Critically Endangered or Extinct with a time period of one or two generations, because of the effects of the identified threats, notably climatic drying and warming which, together with imposed anthropogenic fire regimes, are projected to increase the risk of intense and repeat fire events.

**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 (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Schoenus imberbis*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/a8062867-c246-417e-bfc3-ce0562cd3d04>