

## *Pseudoraphis paradoxa* Slender Mud-grass

### Taxonomy

*Pseudoraphis paradoxa* (R. Br.) Pilg.

### Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1996).

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

### Proposed conservation status

Endangered in Victoria

Criteria B1ab(iii)+2ab(iii)

### Species Information

#### Description and Life History

The taxon is a rhizomatous and stoloniferous annual or perennial. Stems decumbent, culms weakly ascending, to 50 cm high; nodes glabrous. Leaves glabrous to sparsely ciliate, smooth; blade flat, 3-8 cm long and 2-6 mm wide, usually with 3-5 nerves equally prominent; ligule membranous, erose, c. 1 mm long. Panicle or raceme linear, 2-8 cm long, lower branches, if present, appressed to main axis, to 15 mm long. Spikelets shortly pedicellate, narrow-lanceolate, mostly 6-10 mm long and most or all subtended by a scabrous bristle to c. 2 cm long; lower glume broad, rounded or truncate, c. 1 mm long, membranous, apparently nerveless; upper glume as long as the spikelet, 15-19-nerved, scabrous along the nerves; lemma of lower (male) floret smooth, subequal to or as long as upper glume, palea slightly shorter; lemma of upper floret acute, c. 3 mm long, membranous, almost completely enclosing floret, palea equal to lemma. The taxon flowers from February to April (VicFlora no date).

#### Generation Length

The generation length of *Pseudoraphis paradoxa* is inferred to be 5 to 25 years. This is based on the rhizomatous and stoloniferous habit, and the likelihood that the taxon resprouts from the perennial rootstock.

#### Distribution

The taxon is rare in Victoria, where it is known from between Bruthen and the mouth of the Snowy River, the shores of Lake Glenmaggie near Heyfield, and a pre-1900 collection from Lake King near Bairnsdale (VicFlora no date).

Four localities have been identified: south-west shore of Lake Glenmaggie (Public: Lake reserve), Ewing's Marsh, Tildesley Forest Block (Public: State forest), Mundie Creek, Colquhoun Forest (Public: State forest) and Ewing Morass (Public: Wildlife reserve). The taxon is currently known from less than 30 collections in Victoria (SAC 1996).

#### Habitat

The taxon grows in near-coastal, sometimes slightly brackish, creeks and swamps with sandy, peaty or silty substrates. The taxon may be found growing in association with small herbaceous species or in water up to depth of 0.5 m, where often associated with perennial aquatics such as *Eleocharis sphacelata*, *Utricularia australis*, *Myriophyllum* spp. and *Potamogeton* spp. (SAC 1996).

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The taxon could potentially extend across floor of shallow marshes in association with *Eleocharis sphacelata* (Doug Frood pers. comm. 3/3/14).

## Threats

The key threat to the taxon is hydrological change, this includes changes to salinity, nutrient levels and fluctuations in the depth of water. All occurrences are potentially at risk from climate change, with inland occurrences threatened by climatic drying of catchments and coastal occurrences threatened by rising sea level, coastal instability and the infiltration of freshwater or brackish water by seawater. The taxon may also be threatened by grazing and trampling by domestic stock and weed invasion.

Very little is known about the ecology of this taxon and therefore whether it is susceptible to threats such as grazing by herbivores or weed invasion. As it relies on wetland habitats, it is susceptible to alteration of its environment caused by changes to hydrology, salinity and nutrient levels or trampling by introduced stock (SAC 1996).

## 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

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.

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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:

### Eligible under Criterion B1 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 1,043 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the landscape scale since there is negligible capacity for recolonisation across catchment boundaries.

It is estimated to have two locations, one for inland occurrences threatened by climatic drying and one for coastal occurrences also threatened by sea level rise, coastal instability and the infiltration of freshwater or brackish water by seawater.. It has a continuing decline in (iii) above.

The taxon is severely fragmented

### Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 68 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has two locations and has a continuing decline in (iii) above.

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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.

Criterion D. Very small or restricted populations				
		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.

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 (1996). *Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 410 Pseudoraphis paradoxa*. Department of Environment and Primary Industries, Victoria.



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Walsh, N.G. (1994). *Poaceae*. In N.G. Walsh and T.J. Entwisle (Eds.), *Flora of Victoria Vol. 2, Ferns and Allied Plants, Conifers and Monocotyledons*. Melbourne: Inkata Press.