



## *Diplachne fusca* subsp. *fusca* Brown Beetle-grass

### Taxonomy

*Diplachne fusca* subsp. *fusca* (L.) P. Beauv. ex Roem. & Schult.

### 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)c(iv)

### Species Information

#### Description and Life History

The taxon is a tufted perennial, culms erect, to 1 m high, sometimes branched near base. Leaves glabrous; blade scabrous, flat or slightly inrolled when fresh, becoming inrolled on drying, to 30 cm long and 7 mm wide; ligule deeply lacerated, to c. 7 mm long. Panicle 10-25 cm long, the branches remaining erect or slightly spreading. Spikelets 7-15-flowered, 9-20 mm long, shortly pedicellate, dull pale green, greyish or purplish; glumes ovate, often shallowly bilobed, the lower 2.5-4 mm long, the upper 3-5 mm long; lemma oblong-ovate, 2.5-5 mm long, almost flat, shallowly bilobed at apex with the lobes tapered and often minutely toothed, the midnerve produced as a mucro to c. 0.5 mm long between the lobes, lateral nerves prominent, margins and a narrow line either side of the midnerve densely white silky-hairy toward the base. The taxon flowers most of year (VicFlora 2017).

#### Generation Length

The generation length of *Diplachne fusca* subsp. *fusca* is estimated to be 5 to 25 (midpoint 15) years. The length is based on the estimated mean interval between peak rainfall and flood events mediated, under undisturbed pre-European settlement conditions, by La Nina events. The taxon is a perennial grass which recruits episodically following peak rainfall or flood events from a soil-stored seedbank.

#### Distribution

The taxon is confined in Victoria to floodplains and billabongs of the Murray River and the lower reaches of its major tributaries. Two collections from the Melbourne metropolitan area (near Sunshine) are probably a result of inadvertent transport of seed with stock from northern Victoria or interstate. It also occurs in all mainland States and Territories (VicFlora 2017).

The origin status of site records on the Northern Plains between Tatura and Kyabram and specimen records on the Avon River near St Arnaud and at Tatura East is ambiguous - they may be indigenous or recent naturalisations.

#### Habitat

The taxon is confined in Victoria to floodplains and billabongs. It frequently grows in shallow water (VicFlora 2017).

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### Threats

The taxon is a habitat specialist dependent on the hydrological stability of its lakebed or floodplain habitat. It is therefore threatened by any reduction in the reliability of flood events in response to climatic drying and diversion of flood waters for irrigation and town water supplies.

If the taxon is confirmed to be a C4 grass, like almost every other Australian member of the subfamily Chloridoideae, then it may be well adapted to climatic warming and changing seasonality of rainfall and flood events, with increasing frequency of summer rainfall at the expense of reliable winter rain. The taxon may therefore be capable of extending its range, compensating for other identified threats.

### 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 style="text-align: center;"><i>based on any of the following:</i></p> <ul style="list-style-type: none"> <li>(a) direct observation [except A3]</li> <li>(b) an index of abundance appropriate to the taxon</li> <li>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</li> <li>(d) actual or potential levels of exploitation</li> <li>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</li> </ul>			

### 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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 40 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas. The lower bound estimate excludes records on the Upper Avon River and on the Northern Plains near Tatura which may be naturalised.

The taxon is estimated to be severely fragmented naturally at both the regional and landscape scales with all geographically isolated occurrences separated at spacings which exceed the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal other than by water which is limited to downstream dispersal within each catchment unit.

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

It is estimated to have extreme fluctuations in (iv) above, as it is likely to be subject to seasonal fluctuations in population size in response to rainfall and flood events, and it is suspected that these seasonal fluctuations approach or exceed the tenfold threshold.

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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 no available estimate of population size for the taxon, which is likely to be subject to significant fluctuations in population size between successive recruitment events.

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.

VicFlora (2017) Flora of Victoria, Royal Botanic Gardens: *Diplachne fusca* subsp. *fusca*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/cf4792a3-68b3-4580-bcc7-6f1fb5566045>