



Gahnia grandis Brickmaker's Sedge

Taxonomy

Gahnia grandis (Labill.) S.T. Blake

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria A3c+4c; B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v)

Species Information

Description and Life History

Robust tussock-forming perennial. Culms stout, often basally sprawling for 1-2 m, 1-3 m high, 2-10 mm diam. Leaf-blades flat, spreading, scabrous, as long as culm; ligules narrow, chartaceous; sheaths brown, dull with some shining patches. Inflorescence erect or somewhat spreading, 50-100 cm long, with 6-10 nodes. Spikelets 2-flowered; glumes 10-17, the lowest 8-12 much shorter than those above and erose or 3-fid, brown to dark grey-brown, minutely scabrous, upper glumes with acute to obtuse apex; stamens 4-6; anthers 2.0-3 mm long excluding apical appendage 0.4-0.7 mm long. Nut oblong to ellipsoid, terete, smooth, reticulate, shining, 3.0-4.5 mm long, 1.2-1.9 mm diam., red-brown to dark brown or orange-brown. Brickmakers Sedge. The taxon flowers from spring-summer (VicFlora 2021).

Generation Length

The generation length of *Gahnia grandis* is inferred to be 50 years. This is based on the shortly rhizomic habit of the plant and the likelihood that recruitment occurred predominantly following intense wildfire at plausible pre-settlement frequencies of 45-90 years. It should be noted that the taxon is largely associated with rainforest and associated swamp scrub habitat.

Distribution

The taxon is recorded in Victoria only from Gembrook-Beenak area and the northern part of Wilsons Promontory (VicFlora 2021).

Habitat

The taxon is found in damp shaded sites beside streams and swamps (VicFlora 2021). It is occasionally sympatric with *Gahnia sieberiana* or *G. clarkei*. It is often associated with dense stands of *Syzygium*, *Dicksonia*, *Melaleuca squarrosa*, *G. clarkei*, *Acacia melanoxylon*, *Epacris impressa*, *Callistemon pallidus*, *Monotoca elliptica*, *G. sieberiana*, *Blechnum nudum*, *Gleichenia microphylla*, *Baloskion tetraphyllum* and *Carex fascicularis*. It has a strong association with Cool Temperate Rainforest, Warm Temperate Rainforest overlap on Wilsons Promontory and tall swamp scrub affiliated with rainforest.

Threats

The key threat identifiable for this taxon is the impact of unfavourable fire regime on the inferred habitat of the taxon, resulting in the progressive contraction in the extent and quality of rainforest and associated swamp forest habitat, particularly on Wilsons Promontory. This is exacerbated by an increasing risk of recruitment failure in response to drought stress.

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> <ul style="list-style-type: none"> (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 A3 as Endangered

The population reduction over the next 100 years is projected to be 30 to 80 % (midpoint 50%), based on (c) above.

Future decline is based on the likely impact of an imposed fire regime.

Eligible under Criterion A4 as Endangered

The population reduction over any 150 year period, including both past and future (up to 100 years in the future), is estimated to be 30 to 80% (midpoint 50%), based on (c) above. The causes of reduction may not have ceased, be understood or be reversible.

Past decline is difficult to estimate with any confidence, however the elimination of extensive stands of swamp forest in the Westernport catchment suggests that historic decline may have been considerable.

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 ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 1,309 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally severely fragmented at both the regional and landscape scales with no known mechanism for long distance dispersal, noting that the taxon is habitat-specific in habitats restricted to low-lying areas within discrete catchments.

It is inferred to have 2 locations. 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 36 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 (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. Populations on Wilsons Promontory typically occur in inaccessible sites. Therefore, population size cannot be estimated with any confidence.

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 ² or number of locations ≤ 5

Evidence:

Eligible under criterion D2 as Vulnerable

The taxon is inferred 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.



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