Threatened Species Assessment

Plinthanthesis paradoxa
Wiry Wallaby-grass

Taxonomy

Plinthanthesis paradoxa (R. Br.) S.T. Blake

Current conservation status

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

Proposed conservation status

Vulnerable in Victoria

Criterion C1

Species Information

Description and Life History

The taxon is a tufted perennial, culms erect, to 0.8 m high. Leaves glabrous; sheath often purplish; blade usually inrolled or folded, to 50 cm long and c. 1 mm wide; ligule a ciliate rim 0.2-0.5 mm long. Inflorescence a sparse pyramidal panicle to 15 cm long. Spikelets mostly 4-flowered, 5-8 mm long; glumes usually purplish, acute, sub-equal, 4-8 mm long; lemma 2-4 mm long, evenly covered in lower half by minute (0.1-0.2 mm) spreading hairs; awn 0.5-1 mm long, finally obliquely recurved; lateral lobes of lemma membranous, broadly acute, equal to awn; palea oblong; anthers c. 2.5 mm long. Flowers September-March (VicFlora 2019).

Generation Length

The generation length of *Plinthanthesis paradoxa* is estimated to be 2 to 10 years. This is based on field observations that the plants are moderately robust, clearly perennial, and are in a range of habitats that suggests the taxon tolerates moist to moderately dry conditions. At each observed location, there had been no very recent fires, suggesting it is not a short-lived fire-response taxon. Maximum longevity is conceivably considerably more than 10 years, and earliest seed-producing age is likely to be 1-2 years.

Distribution

In Victoria the taxon is confined to the far east from Genoa to the NSW border south of the Princes Hwy, except for occurrences around Maramingo Swamp immediately north of the Highway. It is also found in coastal NSW as far north as the Newcastle area.

Habitat

The taxon is found in damp heathland, heathy woodland, and heathy lowland forest, mostly on sandy soils with a fairly high organic fraction, often with an impeded drainage layer below the sand.

Commonly associated taxa include *Corymbia gummifera, Eucalyptus globoidea, Banksia serrata, Leptospermum trinervium, Melaleuca squarrosa, Xanthorrhoea resiniferum, Gymoschoenus sphaerocepalus, Baeckea linifolia, Dillwynia glaberrima, Lepidosperma filiformis, Ricinocarpos pinifolius, Lycopodium deuterodensum, Tricostularia pauciflora, Hakea decurrens,* and *Leptocarpus tenax*.

Threats

The most significant threat is probably climate-change induced drying of the water table beneath stands of the taxon. Despite this, the taxon was noted across a fairly wide spectrum of barely to significantly damp vegetation types. The threat is considered to be of relatively low significance in the near- to mid-term in the sense that, should its habitat become unsuitable, many taxa that are more or less confined to the vast tracts of damp heathlands in Gippsland are likely to become threatened as a consequence.

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

The past population reduction does not meet the threshold for eligibility under criterion A2, and the future population reduction does not meet the threshold for eligibility under criterion A3.

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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 209 km² and the Area of Occupancy (AoO) is estimated to be 38 km², 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 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:

Eligible under Criterion C1 as Vulnerable

It is estimated that there are 2,500 mature individuals. This is based on observations of occurrences of plants at about 6 sites of 10 known by herbarium records. Subpopulations were generally discrete with an estimated

average number of 50 plants (N.Walsh pers. obs.). An assumption is made that the ten known sites represent 20% of its entire occurrence in Victoria, based on a guess of the abundance of suitable habitat in the relatively remote and little-visited part of the state. Therefore 50 subpopulations each with 50 plants generates an estimate of 2,500 total plants.

There is estimated to be a continuing decline of 10 to 20% within three generations.

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:

Ineligible under Criterion D

It is estimated that there are 2,500 mature individuals, which exceeds the thresholds for criterion D.

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: *Plinthanthesis paradoxa*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/396859bb-6495-42d5-bc15-34ea3788884e