Threatened Species Assessment

Prasophyllum maccannii
Inland Leek-orchid

Taxonomy

Prasophyllum maccannii D.L. Jones & D.T. Rouse

The taxon is part of the *Prasophyllum pyriforme* complex and was previously described as *Prasophyllum* aff. *pyriforme* B and *P.* sp. aff. *pyriforme* C.

The taxon differs from *Prasophyllum pyriforme*, which occurs in outer north-eastern Melbourne and has more crowded, slightly larger flowers with a more shallowly notched callus on the labellum (Backhouse *et al*., 2016).

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2007).

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

Proposed conservation status

Endangered in Australia

Criteria A2ace+3ce+4ac; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

A robust, deciduous terrestrial orchid with a single erect terete basal green leaf, and an erect flower stem to 60 cm tall, bearing up to 45 non-resupinate, relatively large, crowded, greenish to brownish flowers with connate lateral sepals, a large labellum that is broad at the base, constricted just above the middle and ending in a long, pointed apex, with a narrow pinkish lamina and a broad fleshy tapered green callus plate extending almost to the labellum apex. Flowers in November and December. It flowers freely without the need for summer bushfires.

Generation Length

The generation length of *Prasophyllum maccannii* is estimated to be 40 to 50 years. Generation time for non-colonial terrestrial orchids is based on the annual replacement of the mother tuber by daughter tubers. Whilst somatically immortal, every individual is susceptible to endogenous exhaustion or environmental causes of mortality at rates likely to result in replacement at intervals of several decades only. Such orchids are classed as obligate seed regenerators as they are reliant on seed-based recruitment for population maintenance.

Distribution

The taxon is endemic to Victoria, where it is known mainly from the Grampians region in the west, with an outlying population in the Brisbane Ranges near Geelong. The altitude ranges from 215 - 320 metres above sea level (Backhouse *et al.,* 2016). Specifically, the taxon is apparently confined to the Stawell, Deep Lead and northern Grampians area of western Victoria (VicFlora 2015). Some populations occur in National Parks, including Grampians NP and Deep Lead Nature Conservation Reserve.

Habitat

The taxon grows in dry heathy woodland and open forests, usually where Brown Stringybark (*Eucalyptus baxteri*) is present, on well-drained clay loam, sometimes gravelly soils. In the northern Grampians, a population grows under Oyster Bay Pine (*Callitris rhomboidea*) on sandy soils (Backhouse *et al*. 2016; VicFlora 2015).

Threats

The taxon has declined from extensive historical land clearing and degradation of habitat.

The future of the private property sites is not secure, and plants on roadsides are at risk from vehicle movement, road maintenance works and weed invasion. The small total population size and highly fragmented nature or remaining populations renders it susceptible to stochastic events.

Habitat is protected in reserves but is likely to decline through impacts of disturbance, disease, weed invasion and increasingly dry conditions from declining rainfall, possibly leading to further decline and loss of subpopulations.

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:

Eligible under Criterion A2 as Endangered

The population reduction over the past 120 to 150 years is suspected to be 40 to 70%, based on (a), (c) and (e) above.

Past decline is based on some loss of habitat on which the taxon probably occurred, particularly in the Pomonal district.

The causes of the reduction may not have ceased, be understood or be reversible.

Eligible under Criterion A3 as Endangered

The population reduction over the next 100 years is suspected to be 20 to 50%, based on (c) and (e) above.

Several sites are located on private property and roadsides and, therefore, could be subject to habitat loss and degradation. At least 2 subpopulations (Flat Rock and Glenorchy) have disappeared in recent decades, and no plants have been seen at the Brisbane Ranges locality for several years now, it too being feared extinct. Even in the larger subpopulations fewer plants have been seen flowering in recent years and these also seem to be in decline.

Eligible under Criterion A4 as Endangered

The population reduction over any 120 to 150 years period, including both past and future (up to 100 years in the future), is projected to be 40 to 70%, based on (a) and (c) above. The causes of reduction may not have ceased, be understood or be reversible.

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:

Eligible under Criterion B1 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 4,237 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

Individual occurrences are considered severely fragmented based on the taxon's limited dispersal ability, the barriers to dispersal and/or the lack of habitat separating them. Such fragmentation precludes the possibility of recolonisation in the event of local extinction.

It is estimated to have 2 locations. It has a continuing decline in (i), (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 44 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, the taxon is estimated to be severely fragmented, is estimated to have 2 locations and has a continuing decline in (i), (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

It is suspected that there are 400 to 800 mature individuals, but other thresholds under this criterion have not been met.

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:

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

Backhouse, G., Kosky, B., Rouse, D., and Turner, J. (2016). *Bush Gems: A Guide to the Wild Orchids of Victoria, Australia*. Melbourne, Victoria: EBook

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SAC (2007). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 786 *Prasophyllum maccannii.*

VicFlora (2015). Flora of Victoria, Royal Botanic Gardens Victoria: *Prasophyllum maccannii.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/3fe37ed4-957e-4084-b17b-bfc2b9e9b85e