Threatened Species Assessment

Prasophyllum readii
Painted Leek-orchid

Taxonomy

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

This species is part of the *Prasophyllum pyriforme* complex and has been previously known as *Prasophyllum* sp. aff. *pyriforme* E.

Current conservation status

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

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

Proposed conservation status

Critically Endangered in Australia

Criteria A2ce+3ce+4abce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C2a(i,ii); D

Species Information

Description and Life History

A deciduous terrestrial orchid with a single erect terete basal green leaf, and an erect flower stem to 30 cm tall, bearing up to 25 non-resupinate, small, well-spaced, colourful green, brown or maroon flowers, the labellum broad at the base then constricted near the middle, with a narrow, tapered apical portion, a narrow pale pink lamina and a fleshy green callus plate callus with a pronounced medial constriction and ending in a narrow apical tail-like portion, and extending almost to labellum apex. Flowers in November and December.

Generation Length

The generation length of *Prasophyllum readii* is suspected to be 30 to 50 years. Generation time for non-colonial terrestrial orchids is estimated to be a nominal 30 years 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. It is known only from a single, very small and declining subpopulation growing on private land used for farming.

Habitat

The taxon is found in a swamp with sedges, rushes, and forbs on white silty clay loam in seasonally wet remnant western basalt plains grassland (SAC 2007).

Threats

The taxon has almost certainly suffered a major historical decline in range and abundance due to historical habitat destruction. In 2007 the then only known subpopulation, which was on private land, was considered at risk from

weed invasion, soil compaction and stock grazing, although some seasonal grazing may be helping to reduced competition from pasture grasses and weeds (SAC 2007).

Plants also occurred on the adjoining roadside but have disappeared due to soil disturbance from road maintenance, and competition from weeds, especially thick swards of *Phalaris* choking the site. The taxon is now considered as probably extinct. According to Backhouse *et al.* (2016), when the taxon was first discovered there were about 200 plants, but the subpopulation had declined to fewer than 50 plants with no plants having been seen in the last 3 years.

The single site and tiny area occupied by the taxon renders it at major risk from stochastic events. Climate change may lead to long-term drying out of the seasonally wet habitat preferred by this taxon. Virtually no suitable habitat remains in the district so the chances of locating additional populations are very low.

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 Critically Endangered

The population reduction over the past 90 to 150 years is inferred to be 90 to 99%, based on (c) and (e) above.

The taxon was almost certainly once much more widespread and abundant in the district but almost all habitat has been lost due to clearing for agriculture, and any remaining habitat such as along roadways suffering weed invasion. The recent observed decline in numbers suggests it may be to the point of extinction, due to habitat disturbance and weed invasion

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

Eligible under Criterion A3 as Critically Endangered

The population reduction over the next 90 to 100 years is projected to be 90 to 100%, based on (c) and (e) above.

It is highly unlikely that such a small population in such a tenuous habitat will survive without direct and sustained management intervention. The taxon is highly likely to become extinct due to ongoing disturbance and habitat changes due to drying conditions, and the lack of effective conservation management of the population. The chances of finding more populations and plants is very low due to the almost complete loss of habitat in the region.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 90 to 150 year period, including both past and future (up to 100 years in the future), is inferred to be 90 to 100%, based on (a), (b), (c) and (e) 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 Critically Endangered

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

It is estimated to have 1 location. 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 Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 4 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. The taxon is estimated to have 1 location and to have 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:

Eligible under Criterion C2 as Critically Endangered

It is estimated that there are 1 to 50 mature individuals. When first discovered about 200 plants were present, but the subpopulation has declined to fewer than 50 plants and no plants have been seen recently (Backhouse 2016), and the species is probably extinct.

The number of mature individuals is estimated to continue to decline. The taxon is highly likely to become extinct due to ongoing disturbance and habitat changes due to drying conditions, and the lack of effective conservation management of the population

The number of mature individuals in each subpopulation is 50 or fewer and the percentage of mature individuals in one subpopulation is 90-100%.

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 D as Critically Endangered

The taxon is estimated to have 1 to 50 mature individuals.

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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