Threatened Species Assessment

Prasophyllum lindleyanum
Green Leek-orchid

Taxonomy

Prasophyllum lindleyanum Rchb. f.

Prasophyllum lindleyanum is very similar to the South Australian *P. pallidum*, which reproduces without fertilization, has a larger ovary, no pink tints, a broader labellum, which is not sigmoid, and often with a conical spur at the base (VicFlora 2015).

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 A2ac+3bc+4abc; B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon has a flowering stem slender, 10-35 cm high. Leaf-blade to 30 cm long, 3-5 mm diam. at base, apex lax. Flowers 10-20, greenish, fragrant, in a loose raceme to 18 cm long; ovary obovoid, to 3 mm long, inclined at c. 30 deg. to the rachis; sepals green, 5-7 mm long, dorsal sepal at 90 deg. to ovary, ovate-lanceolate, lateral sepals free, erect, divergent; petals 4-5 mm long, narrow-oblong. Labellum sessile, narrowly trullate, 5-6 mm long, sigmoid in profile, lamina greenish or pale pink, papillate, margins crinkled, slightly incurved, callus green, narrow, extending beyond second bend, papillate. Column appendages pale, lanceolate, c. 2 mm long (VicFlora 2015).

The taxon flowers from September to January, depending on altitude. The flowers are likely to be self-pollinating giving rise to highly uniform plants across its range (Backhouse *et al*. 2016).

Generation Length

The generation length of *Prasophyllum lindleyanum* is estimated to be a nominal 30 years. The 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 that are 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 widely but sporadically distributed across Victoria, from the coast to the mountains. The altitude ranges from 10-1,300 metres above sea level. The taxon also occurs in Tasmania (Backhouse *et al*. 2016). The taxon is well-conserved in biological reserves.

Habitat

The taxon grows in a variety of habitats from coastal heath to mountain open forest, on more fertile light sandy loam to heavier clay loam soils (Backhouse *et al*. 2016). The taxon is widespread, but it is generally uncommon in near-coastal scrub, dry woodlands further inland and sub-alpine herbfield (VicFlora 2015).

Threats

The taxon has a very broad distribution (Backhouse *et al*. 2016), and many populations are situated in conserved forest. The taxon is likely to have suffered significant habitat loss in parts of its range, notably in the greater Melbourne region. Current and future threats include incremental habitat loss, potentially compromised pollination, and seed set (noting that *Prasophyllum* taxa have poor seed viability), browsing by exotic invertebrates and native and exotic vertebrates, and recruitment failure due to extreme 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%

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 60 to 120 years is estimated to be 30 to 50%, based on (a) and (c) above.

The taxon is likely to have suffered significant habitat loss in parts of its range, notably in the greater Melbourne region.

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 projected to be 30 to 50%, based on (b) and (c) above.

Future decline is based on the identified threats.

Eligible under Criterion A4 as Endangered

The population reduction over any 60 to 120 year period, including both past and future (up to 100 years in the future), is estimated to be 30 to 50%, based on (a), (b) 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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 152 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the current and future threats to the taxon.

The taxon is estimated to have four locations (Goldfields, Coastal, Melbourne region and Alpine), which can be identified based on regional differences in tenure, climate, vegetation type and elevation. The identified threats operate with contrasting intensities in some of these locations.

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 estimated that there are 25,000 to 50,000 mature individuals, which exceeds the thresholds for criterion C.

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 25,000 to 50,000 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

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

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014.* Department of Environment and Primary Industries, Melbourne. Retrieved from:

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Rogers, R.S. (1922). Contributions to the Orchidology of Australia and New Zealand. *Transactions and proceedings of the Royal Society of South Australia, 46*, 149.

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