Threatened Species Assessment

Prasophyllum spadiceum
Brown-lip Leek-orchid

Taxonomy

Prasophyllum spadiceum D.L.Jones & R.J.Bates

This taxon was named and described in 2017. It was previously known as *Prasophyllum* sp. aff. *fitzgeraldii* C.

The taxon is closely related to the South Australian *Prasophyllum fitzgeraldii*, but that taxon has a darker pink to reddish labellum lamina and the callus plate has a different structure. True *Prasophyllum fitzgeraldii*, as represented by the type specimen from the Lofty Ranges, South Australia, is not believed to occur in Victoria (VicFlora, 2018).

Current conservation status

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

Proposed conservation status

Critically Endangered in Victoria

Criterion A2bce+3ce+4bce

Species Information

Description and Life History

The taxon is a flowering stem slender, 20-40 cm tall. Leaf-blade to 20 cm long, 2-4 mm diam. at base, erect, apex senescent at flowering. Flowers 10-30, mostly greenish, fragrant, in a dense raceme 5-10 cm long; ovary sessile, obovoid, 5-7 mm long; sepals 5-7 mm long, dorsal sepal ovate-lanceolate, acute, lateral sepals free, ovate-lanceolate, parallel to slightly divergent, recurved, apex bidentate; petals 4-5 mm long, linear-lanceolate, spreading, whitish. Labellum sessile, ovate, 4-5 mm long, reflexed at 45-90 deg. near the middle, lamina white, upper margins undulate; callus slightly raised, narrowing distally and extending nearly to labellum apex, brown, papillate. Column appendages oblong, to 2 mm long. The taxon in September and October (VicFlora 2018).

The taxon is another in a suite of small, very poorly known leek-orchids allied to the South Australian taxa *P. fitzgeraldii.* It can be distinguished by its very small, somewhat crowded pale greenish flowers with short, broad sepals ad petals and the labellum with a white lamina and a broad, raised, grooved greenish brown callus plate extending almost to the apex. The lamina and callus plate are densely covered by minute hairs, conferring a typically crystalline or frosted appearance (Backhouse et al. 2016).

Generation Length

The generation length of *Prasophyllum spadiceum* is suspected to be 20 to 40 (midpoint 30) 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, each 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 reliant on seed-based recruitment for population maintenance.

Distribution

The taxon grows in reserves and on covenanted private land. It was once almost certainly more widespread and abundant in the region, which has suffered extensive loss and degradation of habitat. It is known from a small area between Apsley and Kaniva in the far west of the state. The altitude ranges from 110-135 metres above sea level. The taxon also occurs in South Australia (Backhouse et al. 2016; VicFlora, 2018).

The taxon appears to be extremely rare, being known only from a couple of sites and low numbers of plants. As there are reasonably large blocks of bushland occurring in the district, it possibly occurs at other sites, but has been overlooked or misidentified (Backhouse et al. 2016).

Habitat

The taxon grows in heathy woodland and mallee heath on sandy to light clay loam soils (Backhouse et al. 2016).

Threats

Subpopulations and habitat of the taxon may be at risk from disturbance, weed invasion, altered fire regimes, increasingly dry conditions from declining rainfall, and a consequent increase in severity and intensity of bushfires. Very small subpopulations are highly susceptible to stochastic events causing major decline or local extinction within a very short time frame.

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 60 to 120 years is inferred to be 30 to 90% (interval 80%), based on (b), (c) and (e) above.

The taxon was likely to have been more widespread and abundant in the district, however, most of the habitat has been lost in clearing for agriculture.

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 60 to 100 years is inferred to be 40 to 80%, based on (c) and (e) above.

Faced with the identified threats, it is highly unlikely that the small subpopulations will survive without direct and sustained management intervention. The chances of finding more subpopulations and plants are low.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 60 to 180 year period, including both past and future (up to 100 years in the future), is estimated to be 50 to 85%, based on (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 Endangered

The Extent of Occurrence (EoO) is estimated to be 309 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

There is estimated to be one location, it is severely fragmented, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above, as a result of the projected impact of the identified threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) is estimated to be 12 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA As above, it is severely fragmented, has one location and has a continuing decline in (i), (ii), (iii), (iv) and (v).

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 Endangered

It is estimated that there are 60 to 200 mature individuals, based on sporadic surveys and VBA records. The taxon is known from fewer than 200 plants, with a maximum of less than 100 plants in the 2 larger subpopulations.

The number of mature individuals is inferred to continue to decline, and the number of mature individuals in each subpopulation is 250 or fewer.

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 Endangered

It is estimated that there are 60 to 200 mature individuals.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

References

Backhouse, G. and Cameron, D. (2005). Application of IUCN 2001 Red List Categories in Determining the Conservation Status of Native Orchids of Victoria, Australia. *Selbyana* 26(1,2): 58-74.

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