Threatened Species Assessment

Prasophyllum aff. *occidentale* D
Riverina Leek-orchid

Taxonomy

Prasophyllum aff. *occidentale* D sensu Rouse (2002)

This is an undescribed species that is related to *Prasophyllum occidentale.*

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

Criteria A2ace+3ce+4ace

Species Information

Description and Life History

The taxon has a flowering stem slender, 15-30 cm tall. Leaf-blade to 15 cm long, 2-3 mm diam. at base, apex erect, often partially senescent at flowering time. Flowers 5-20, small, fragrant, reddish brown, in a moderately loose spike 5-10 cm long; ovary obovoid, c. 3 mm long; sepals 5-7 mm long, dorsal sepal ovate-lanceolate, deflexed, lateral sepals linear-lanceolate, free, more or less parallel, straight or recurved; petals linear-lanceolate, 6-8 mm long. Labellum subsessile, ovate-lanceolate, 5-6 mm long, porrect at base, reflexed at less than 90 deg. in distal third, lamina white, greenish or pink, margins more or less entire; callus plate smooth, fleshy, raised, occupying much of labellum surface, green or brownish, extending well beyond labellum bend. Column appendages linear-oblong, c. 2 mm long. The taxon flowers in August and September. This taxon has been confused with both *P. suaveolens* and *P. occidentale*, but has larger flowers and an earlier flowering time than the former and more entire labellum margins than the latter (VicFlora 2015).

The taxon flowers well in years of good winter rain, but flowers sporadically or not at all in drier years. The *Prasophyllum* genus consists of glabrous herbs arising annually from ovoid tubers. The plants are pollinated by nectar-seeking insects, principally wasps and native bees. Some species apparently producing seed without fertilisation and flowering in many species is enhanced by summer fires.

Generation Length

The generation length of *Prasophyllum* aff. *occidentale* D is estimated to be 40 to 50 years. Generation time for non-colonial terrestrial orchids is estimated 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 (OSRs) reliant on seed-based recruitment for population maintenance.

Distribution

The taxon is restricted to a small area in north central Victoria between Echuca and Inglewood, at Terrick Terrick, Mitiamo, Hunter and Inglewood. Backhouse et al. (2016) record the taxon as *Prasophyllum* 'northern plains' and state that it also occurs in NSW.

Habitat

The taxon is found in grassland on fertile sandy loams (VicFlora 2015). Specifically, it grows in herb-rich native grassland and grassy and sparsely shrubby woodland, on silty clay loam soils (Backhouse et al. 2016). The altitude ranges from 85-210 metres above sea level.

Threats

The taxon was more common and widespread on the northern plains but is now extremely rare, as a result of extensive alternation and destruction of habitat. The few remaining populations are confined to small to tiny patches of remaining habitat, where they are at risk from weed invasion and disturbance (Backhouse et al. 2016).

The habitat at three subpopulation localities is protected in reserves, but is likely to decline through the impacts of disturbance, weed invasion and increasingly dry conditions from reducing rainfall, possibly leading to further decline and loss of subpopulations. 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 120 to 150 years is inferred to be 95 to 99%, based on (a), (c) and (e) above.

Past decline is based on loss of subpopulations and extensive loss of habitat.

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 50 to 85%, based on (c) and (e) above.

Future decline is based on recent declines in and loss of subpopulations, and ongoing habitat degradation.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 120 to 150 years period, including both past and future (up to 100 years in the future), is inferred to be 50 to 99%, based on (a), (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

Past decline is based on loss of subpopulations and extensive loss of habitat.

Future decline is based on recent declines in and loss of subpopulations, and ongoing habitat degradation.

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 B as Endangered

The Area of Occupancy (AoO) is estimated to be 16 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

Considering the limited dispersal ability of the taxon, the barriers to dispersal, or lack of habitat separating them, the individuals can be considered to be severely fragmented.

The northern plains, where all subpopulations occur, is deemed a single location based on similar topography, climate and suite of threats operating on the subpopulations.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on recent declines in and loss of subpopulations, and ongoing habitat degradation.

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 200 to 400 mature individuals. The number of mature individuals is based on sporadic surveys and Victorian Biodiversity Atlas (VBA) records.

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

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 200 to 400 mature individuals.

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

References

Backhouse, G., and Jeanes, J. (1995). *The Orchids of Victoria*. Melbourne, Victoria: Melbourne University Press.

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: https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf

Jones, D, L. (2006). *A complete guide to native orchids of Australia including the island territories.* Frenchs Forest, N.S.W.: New Holland.

VicFlora (2015). Flora of Victoria, Royal Botanic Gardens Victoria: *Prasophyllum* aff. *occidentale* D. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/4fa044cf-16d4-4ba1-b538-47c1c641dac5