Threatened Species Assessment

Prasophyllum sp. aff. *occidentale* E
Clumping Leek-orchid

Taxonomy

Prasophyllum sp. aff. *occidentale* E sensu Rouse (2002)

Some authors regard *P. occidentale* as being endemic to South Australia with several similar-looking undescribed taxa present in Victoria, namely *Prasophyllum* sp. aff. *occidentale* C, *Prasophyllum* aff. *occidentale* D and *Prasophyllum* sp. aff. *occidentale* E. The taxon has been confused with both *Prasophyllum suaveolens* (with which it sometimes grows) and *P. occidentale*, but has larger flowers and an earlier flowering time than the former and more entire labellum margins than the latter (VicFlora 2020).

Current conservation status

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

Proposed conservation status

Critically Endangered in Australia

Criteria A2ace+3ce+4ace; C1

Species Information

Description and Life History

The taxon is a glabrous herb arising annually from ovoid tubers. Flowering stem slender, 15-30 cm tall. Leaf solitary with blade to 15 cm long, 2-3 mm diam. at base, apex erect, often partially senescent at flowering time. Flowers 7-25, small, fragrant, yellowish green to brownish, in a moderately loose spike 5-11 cm long; ovary obovoid, c. 3 mm long; sepals 7-8 mm long, dorsal sepal ovate-lanceolate, deflexed, lateral sepals linear-lanceolate, free, more or less parallel, straight or recurved; petals linear-lanceolate, 6-7 mm long. Labellum subsessile, ovate-lanceolate, 4.5-5.5 mm long, porrect at base, reflexed at about 90 deg. near middle, lamina cream to reddish, margins crinkled to slightly irregular; callus plate smooth, fleshy, raised, green or brownish, extending well beyond labellum bend. Column appendages linear-oblong, c. 2 mm long. The taxon flowers September to October (VicFlora 2020).

Prasophyllum taxa are pollinated by nectar-seeking insects, principally wasps and native bees. Some species apparently producing seed without fertilization. Flowering in many species is enhanced by summer fires.

Generation Length

The generation length of *Prasophyllum sp. aff. occidentale E* is estimated 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 (OSRs) reliant on seed-based recruitment for population maintenance.

Distribution

The taxon is endemic to western Victoria, where it is apparently extinct on the basalt plains near Melbourne (e.g. St Albans, Laverton, Sunshine, Lara) but is still found in grassland remnants on a few road and rail reserves further west around Wingeel, Derrinallum and Vite Vite (VicFlora 2020).).

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Habitat

The taxon is restricted to basalt plains grassland on heavy clay loam soils (VicFlora 2020).

Threats

Remaining subpopulations occur in tiny degraded habitat remnants on roadsides and rail reserves and have declined after a run of very dry seasons. Additionally, there has been a decline in distribution and abundance due to loss of habitat in the region for agriculture. Habitat at all localities is declining through impacts of disturbance, weed invasion, herbivory by native and exotic herbivores including stock, rabbits, snails and slugs and increasingly dry conditions from reducing rainfall, which will most likely lead to further decline in 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 60 to 120 years is inferred to be 90 to 95%, based on (a), (c) and (e) above.

Historically, the taxon was almost certainly much more widespread and abundant, based on the distance between subpopulations, but has suffered a catastrophic historic decline due to almost total loss of habitat in the region. A subpopulation of several hundred plants at Wingeel occurring on a railway reserve has not been seen since 2001 and is almost certainly extinct. All subpopulations have declined over the last 20 years.

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 projected to be 90 to 99%, based on (c) and (e) above.

Remaining subpopulations occur in tiny degraded habitat remnants on roadsides and have declined after a run of very dry seasons. Habitat at all localities is declining through the impacts of disturbance, weed invasion, herbivory and increasingly dry conditions from reducing rainfall, which will most likely lead to further decline in and loss of subpopulations.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 60 to 120 year period, including both past and future (up to 100 years in the future), is inferred to be 90 to 99%, based on (a), (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 B as Endangered

The Extent of Occurrence (EoO) is estimated to be 200 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

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.

The taxon is severely fragmented anthropogenically at the landscape scale with all known occurrences at separations likely to greatly exceed the dispersal range of the taxon. Although orchid seed are very small, highly mobile and easily dispersed by wind, most seed are deposited within 10-100 m of the parent plant with very few seeds dispersed at the kilometre scale. With only three known surviving occurrences across an almost totally alienated agricultural landscape, the prospect of successful recolonisation from upwind seed sources in the event of local extinction is exceedingly low.

A single location is identified since the identified threats operate uniformly across the very restricted geographic and ecological range of the taxon.

It 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:

Eligible under Criterion C1 as Critically Endangered

It is estimated that there are 200 to 400 mature individuals. There is an estimated continuing decline of 25 to 35 % within one generation.

Eligible under Criterion C2 as Endangered

It is estimated that there are 200 to 400 mature individuals.

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

Remaining subpopulations occur in tiny degraded habitat remnants on roadsides and have declined after a run of very dry seasons. Habitat at all localities is declining through impacts of disturbance, weed invasion and increasingly dry conditions from reducing rainfall, which will most likely lead to further decline in and loss of subpopulations.

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.

DSE (2003). Action Statement - Fragrant Leek-orchid *Prasophyllym* sp. aff. *suaveolens* (Western Basalt Plains) (No. 147). Department of Sustainability and Environment. East Melbourne. Retrieved from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0018/32607/Fragrant_Leek-orchid_Prasophyllum_sp._aff._suaveolens.pdf

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, NSW: New Holland.

VicFlora (2015). Flora of Victoria, Royal Botanic Gardens Victoria: *Prasophyllum* sp. aff. *occidentale* E. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/626db61f-ce32-4c1c-95ce-0ff7eeafdd3a