Threatened Species Assessment

Prasophyllum sp. aff. *validum*
Woodland Leek-orchid

Taxonomy

Prasophyllum sp. aff. *validum*

Rouse (2002) recognised two Victorian taxa closely allied to the South Australian endemic *Prasophyllum validum,* namely *Prasophyllum* sp. aff. *validum* A and *Prasophyllum* aff. *validum* B. Backhouse et al. (2016) also recognised the disjunct southern outlier as *Prasophyllum* 'Inverleigh'. VicFlora (2015) currently synonymises these entities under *Prasophyllum* sp. aff. *validum*.

The distribution of this taxon is poorly known due to confusion with other members of the *P. pyriforme* complex (VicFlora 2015). It is similar to the South Australian *P. validum,* but flowers later, is generally less robust and has smaller flowers with narrower perianth segments (VicFlora 2015).

The taxon differs from *Prasophyllum sylvestre*, which occurs in Gippsland and has yellowish green flowers with a white to pale pink labellum with a green to pinkish callus, and from *Prasophyllum* sp. aff. *montanum*, which occurs in the mountains of eastern Victoria, flowers in summer and has a shorter broader labellum with a shorter, narrower callus and longish, slightly upcurved column appendages that broaden towards the angled apex (Backhouse et al. 2016).

Current conservation status

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

Proposed conservation status

Endangered in Australia

Criteria A2abce+3ce+4abce; B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a glabrous perennial herb arising annually from ovoid tubers. Flowering stem stout, 30-70 cm tall. Leaf solitary, terete, elongate with blade 15-30 cm long, 3-6 mm diam. at base, apex suberect, senescent at flowering time. Flowers 20-45, green and white, fragrant, in a crowded spike 10-25 cm long; ovary obovoid, 4-6 mm long; sepals 8-11 mm long, dorsal sepal ovate-lanceolate, lateral sepals usually fused basally, linear-lanceolate, recurved, parallel; petals linear-oblong, 7-9 mm long. Labellum subsessile, porrect, 6-8 mm long, recurved at about right angles near middle, lamina usually white (rarely pink), margins entire to slightly irregular; callus plate prominently raised, greenish, shiny, broad at base then tapered, extending well beyond labellum bend. Column appendages linear, c. 2 mm long (VicFlora 2015). The taxon flowers October to December. It flowers freely in the absence of fire. Although several subpopulations contain hundreds of plants, the taxon does rely on good winter rains to flower well, flowering sporadically or not at all in dry years (Backhouse et al. 2016).

Generation Length

The generation length of *Prasophyllum* sp. ff. *validum* 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 reliant on seed-based recruitment for population maintenance.

Distribution

The taxon is apparently endemic to Victoria, where it is widely but sporadically distributed across northern and western Victoria between Chiltern and Horsham. The altitude ranges from 180-270 metres ASL (Backhouse et al. 2016; VicFlora, 2015).

Habitat

The taxon grows in a variety of open forest and woodland habitats on stony clay to sandy loam soils. It is usually encountered in small, sparse populations scattered through dry box ironbark forest and Yellow Gum woodland (Backhouse et al. 2016; VicFlora, 2015).

Threats

The taxon was almost certainly once much more widespread and abundant, based on the wide distribution of extant occurrences. However, much of its box-ironbark woodland habitat has been cleared for agriculture or substantially degraded, and remaining occurrences are largely isolated from one another. A number of sites are conserved in biological reserves, but a number still remain on private property, with an uncertain future, and may be subject to habitat loss/damage. Two very small occurrences occur in tiny habitat patches on private land and are at high risk.

Most extant occurrences and habitat are considered at risk from disturbance, weed invasion, targeted and incidental browsing by native and exotic herbivores, including macropods, rabbits, stock, slugs, snails, goats and feral deer, and increasingly dry conditions from declining rainfall. Very small occurrences 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 Endangered

The population reduction over the past 60 to 120 years is estimated to be 50 to 80% (midpoint 65%), based on (a), (b), (c) and (e) above.

An estimate of past decline is based on known extinction of subpopulations and extensive loss and degradation of habitat from agricultural clearance across the range of the taxon.

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 60 to 120 years is estimated to be 50 to 80% (midpoint 65%), based on (c) and (e) above.

An estimate of future decline is based on the projected impact of 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 50 to 80% (midpoint 65%), 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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 64 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is severely fragmented naturally at the regional scale and anthropogenically at the landscape scale with all known occurrences or local clusters of 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 most extant occurrences isolated from each other across a highly fragmented and alienated agricultural landscape, the prospect of successful recolonisation from upwind seed sources in the event of local extinction is exceedingly low.

Four locations can be identified based on regional differences in vegetation pattern, climate and landscape context, each with its own suite of distinctive threats: the Goldfields with the majority of subpopulations, the Northern Plains with two subpopulations, Chiltern with one subpopulation and Inverleigh with one subpopulation.

It has a continuing decline in (ii), (iii), (iv) and (v) above, based on the current and projected impact of the identified threats.

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 Vulnerable

It is estimated that there are 2,000 to 4,000 mature individuals, based on VBA records and sporadic surveys.

A continuing decline of 25 to 55% is estimated to occur within one generation.

Eligible under Criterion C2 as Vulnerable

It is estimated that there are 2,000 to 4,000 mature individuals, it has an estimated continuing decline and the number of mature individual ion each subpopulation is fewer than 1,000.

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 Vulnerable

The taxon is estimated to be very restricted.

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

Rouse, D. (2002). Report on the Taxonomic, Ecological and Conservation Status of Taxa in the Genus *Prasophyllum* R. Br. in South-eastern Australia. Unpublished report to the Australian Orchid Foundation.

VicFlora (2015). Flora of Victoria, Royal Botanic Gardens Victoria: *Prasophyllum* sp. aff. *validum*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/34e9d73d-24f5-4e94-b995-ca9fcc3280f3