

Threatened Species Assessment

Prasophyllum niphopedium Marsh Leek-orchid

Taxonomy

Prasophyllum niphopedium D.L. Jones

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2000).

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

Proposed conservation status

Endangered in Victoria

Criteria A2ace+3ce+4ace; B1ab(iii,v)+2ab(iii,v); C2a(i); D

Species Information

Description and Life History

The Marsh Leek-orchid is a sturdy, summer-flowering, deciduous, terrestrial orchid. It has a single, erect, slender, hollow, terete, green leaf with a reddish base, to 35 cm long. The flower stem emerges through a split in the leaf, usually about 20 cm from the leaf tip. The stem has up to 20 small lightly scented, non-resupinate flowers (to 11 mm across), arranged in a generally crowded spike. The sepals and petals are usually greenish with pink tonings and thin dark reddish stripes. The labellum is white to pinkish, with irregularly crenulate margins and a greenish callus extending for 2/3 the length of the labellum. The dorsal sepal is relatively broad, the lateral sepals are erect and parallel, sometimes joined at the base, with incurved margins, the petals are incurved to slightly spreading. The labellum is sharply curved beyond the middle, the tip not projecting between the lateral sepals. Flowers from December - February.

It is very similar to *Prasophyllum frenchii*, but differs in its later flowering, sub-alpine habitat, fewer and sparser flowers, the crenulate labellum and the less wrinkled callus.

Generation Length

The generation length of *Prasophyllum niphopedium* is estimated to be 20 to 50 (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 apparently confined to sub-alpine meadows and fertile montane woodland in the Mt Cobberas region of eastern Victoria (VicFlora 2018).

Duncan and Coates (2010) notes that it is endemic to a limited area of eastern Victoria, between Wilgulmerang and Benambra, in the Australian Alps IBRA bioregion. It is currently known from four populations, all occurring in the Alpine National Park. There are records of an additional two populations in the park, but plants have not recently

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been seen at these sites. Nothing is known of the historical distribution, although it appears to be naturally restricted to a fairly limited area of the highlands in eastern Victoria.

DSE (2003) noted that it occurred in the Mt Cobberas-Benambra area, reserved in the Alpine National Park. It has not been recorded elsewhere but may be more widespread throughout the Snowy Mountains Range in NSW and Victoria.

Habitat

The taxon grows on snow plains in low herbfields on sub-alpine and alpine plains above 1,000 m altitude, in grassy alpine heath dominated by *Hakea microcarpa*, *Epacris gunnii*, *Epacris brevifolia*, *Baeckea gunniana*, *Poa clivicola* and *Poa sieberiana*, and *Sphagnum* bog margins and along creek lines. Soils are seasonally damp to waterlogged dark brown organic loams (Duncan and Coates 2010).

Threats

The taxon has suffered a historic decline as a result of extensive disturbance from cattle, feral horse and feral pig grazing and trampling and off-road vehicle damage.

All subpopulations and habitat are at risk from further habitat decline due to increasingly dry conditions from declining rainfall and attendant increased bushfire risk. Very small subpopulations are highly susceptible to stochastic events causing major decline or local extinction within a very short time frame.

Current threats include grazing (by feral horses and cattle, and common in the area), inappropriate fire regimes (sites are long unburnt and plants are unlikely to rely on fire for regeneration), site disturbance (some sites are vulnerable to damage from off road vehicles), soil disturbance (some sites are vulnerable to damage from off road vehicles), soil disturbance (pugging of soil by cattle, feral pigs and feral horses) (DSE 2003)..

Potential threats include weed invasion (exotic grasses and opportunistic sedges may establish at the site with disturbance by cattle, feral pigs and feral horses), ecology/biology (conditions for seed recruitment and maintenance of pollinator and fungal activity unknown; disturbance requirements are unknown) (DSE 2003).

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%
<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>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.</p> <p>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]</p> <p>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.</p> <p>based on any of the following:</p> <p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>			

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Evidence:

Eligible under Criterion A1 as Endangered

The population reduction over the past 60 to 150 years is inferred to be 10 to 50%, based on (c) and (e) above.

The taxon was once probably fairly common and distributed along the network of creeklines and swamps on the alpine plains. Although the localities and habitat occur in the Alpine National Park, the taxon has suffered from extensive disturbance from cattle, feral horse and feral pig grazing and trampling and off-road vehicle damage.

Eligible under Criterion A3 as Endangered

The population reduction over the next 60 to 100 years is projected to be 40 to 80%, midpoint 60%, based on (c) and (e) above.

Plant numbers have declined over the last 20 years and are likely to continue to decline. The very small Stockyards subpopulation is at very high risk of extinction. All subpopulations and habitat are at risk from further habitat decline due to increasingly dry conditions from declining rainfall and attendant increased bushfire risk. Very small subpopulations are highly susceptible to stochastic events causing major decline or local extinction within a very short time frame.

Eligible under Criterion A4 as Endangered

The population reduction over any 60 to 150 year period, including both past and future (up to 100 years in the future), is inferred to be 40 to 80%, midpoint 60%, based on (a), (c) and (e) above..

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 (EEO)	< 100 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 249 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

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 VBA.

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

All subpopulations occur in the Cobberas region of the alps, which is deemed a single location.

It has a continuing decline in (iii) and (v) above.

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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 120 to 270 mature individuals, based on VBA records and sporadic surveys.

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

Criterion D. Very small or restricted populations				
		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 km ² or number of locations ≤ 5

Evidence:

Eligible under Criterion D as Endangered

It is estimated that there are 120 to 270 mature individuals.

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

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