



Diuris subalpina Small Snake-orchid

Taxonomy

Diuris subalpina D.L. Jones

Once considered to be present over a wide range in eastern Australia (Rouse 2003), *Diuris pedunculata* has been taxonomically separated into the new species *D. subalpina* (found in southeast New South Wales (NSW), Australian Capital Territory (ACT) and north-east Victoria) with the populations restricted to the New England area of NSW to remain as *D. pedunculata* (Jones 2008). The taxon is distinguished from *Diuris chryseopsis* by its generally later flowering, montane to alpine habitat and slightly smaller flowers. It is similar to *D. monticola* but that taxon has 5-9 leaves in a basal tuft, up to 4 porrect flowers, larger lateral lobes and a shorter basal claw on the labellum (VicFlora 2018).

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria A2ace+4ace; B1ab(iii)+2ab(iii); D

Species Information

Description and Life History

The taxon is a flowering plant slender, 6-15 cm tall. Leaves usually 2, linear, 5-15 cm long, basal. Flowers 1 or 2, nodding, mostly pale yellow with an orange labellum and dark striations on base of dorsal sepal; pedicel (excluding ovary) 2-4 cm long, slender, partly enclosed within bract; dorsal sepal porrect basally then obliquely erect, ovate, 7-10 mm long, shorter than other perianth parts; lateral sepals obliquely deflexed, usually parallel, linear-oblongate, 15-20 mm long, brownish; petals drooping, 11-17 mm long, claw brownish, lamina narrow-elliptic, yellow. Labellum obliquely deflexed, yellow, 14-16 mm long, 3-lobed; lateral lobes tiny, triangular, more or less entire; mid-lobe almost flat, c. 6 times as long as the lateral lobes, ovate to broadly ovate, long-clawed at base, with 2 widely separated, pubescent, longitudinal ridges extending shortly beyond base, a single, less distinct ridge continuing almost to labellum apex. Column wings c. as long as the anther. The taxon flowers from October to December (VicFlora 2018).

The taxon was first discovered in Victoria in 2000, when it was initially identified as *Diuris pedunculata*, a species then thought to occur in the tablelands and mountains of NSW and ACT. However, a subsequent closer examination of *D. pedunculata* across its range revealed that plants from the southern parts of its range (ACT, southern NSW and Victoria) differed significantly from plants considered 'true' *D. pedunculata* that occur in northern NSW. The southern form was subsequently described as a new species - *D. subalpina* - in 2006. In Victoria, the species was thought to be restricted to the far east of the State, but as orchid enthusiasts have become more familiar with this orchid, it has since been found at more localities across a larger range, and extends at least as far west as Tamboritha, just north of Licola. It is most likely to be mistaken for *D. monticola*, with which it often grows, and both species flower at the same time where they grow together (Backhouse et al. 2016).

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Generation Length

The generation length of *Diuris subalpina* is estimated to be 20 to 40 (midpoint 30) years. Long-term observation and monitoring of populations of terrestrial orchids in general suggests very low recruitment over many years, and individual plants may be very long-lived, possibly several decades. As the taxon multiplies vegetatively as well as through seed, generation length is probably reduced when compared with terrestrial orchid species that reproduce through seed only.

Distribution

The taxon occurs in the mountains of eastern Victoria between Tamboritha and Wulgulmerang. The altitude ranges from 800 to 1,420 metres above sea level. The taxon also occurs in New South Wales and Australian Capital Territory (Backhouse et al. 2016). It is known from at least 6 subpopulations (Wulgulmerang, Hinnomunjie, Cobungra, Hotham airport, Dimmock's Lookout, and Bryce's Gorge). Most subpopulations have very low numbers of flowering plants. It is possible that other subpopulations exist although the taxon's apparent preferred habitat of damp subalpine grasslands is fairly limited in occurrence.

Habitat

The taxon often grows in montane grassland, alpine meadows and moorland in moist heavy clay loams and peaty loams (Backhouse et al. 2016; VicFlora 2018).

Threats

There has almost certainly been a historical decline in distribution and abundance due to habitat destruction and degradation, especially in the eastern part of its range, and one subpopulation appears to have become recently extinct. Although the remaining subpopulations occur in protected habitat, subpopulations and habitat may be at risk from disturbance, some weed invasion and increasingly dry conditions from declining rainfall and 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%
<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>			

Evidence:

Eligible under Criterion A2 as Endangered

The population reduction over the past 60 to 120 years is inferred to be 50 to 70%, based on (a), (c) and (e) above.

There has almost certainly been a historical decline in the distribution and abundance of the taxon. This is due to habitat destruction and degradation, especially in the eastern part of its range, and 1 subpopulation appears to have become recently extinct.

The causes of the reduction may not have ceased, be understood or be reversible.

Eligible under Criterion A2 as Vulnerable

The population reduction over the next 60 to 100 years is suspected to be 20 to 40%, based on (c) and (e) above.

There is a possible future decline from disturbance, weed invasion and increasingly dry conditions from declining rainfall and consequent increase in severity and intensity of bushfires.

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 inferred to be 20 to 50%, 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 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) across the taxon's range is estimated to be 934 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The Area of Occupancy (AoO) across the taxon's range is estimated to be 24 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 individuals can be considered to be severely fragmented.

The subalpine region of eastern Victoria from where all the records occur is deemed as a single location, based on topography, habitat, climate and likely threats across all subpopulations.

It has a continuing decline in (iii) above.

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Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 24 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented and is estimated to have 1 location. It has a continuing decline in (iii) 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:

Ineligible under Criterion C

It is estimated that there are 200 to 500 mature individuals, but other thresholds under this criterion have not been met.

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 km ² or number of locations ≤ 5 [ⓐ]

Evidence:

Eligible under Criterion D as Endangered

The taxon is estimated to have 200 to 500 mature individuals, based on sporadic surveys and VBA records.

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
- Jones, D.L. (2008). Twelve new species of Orchidaceae from south-eastern Australia. *The Orchadian*, 15(12), 551.
- Turner, J., Bould, A., and Wilkinson, J. (2014). *Orchids of East Gippsland: A Field Guide*. Bairnsdale: Bairnsdale and District Field Naturalists Club Inc.
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