Threatened Species Assessment

Corybas hispidus
Bristly Helmet-orchid

Taxonomy

Corybas hispidus D.L. Jones

Other Scientific Names: *Corysanthes hispidus* (Backhouse et al., 2016).

Current conservation status

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

Proposed conservation status

Vulnerable in Victoria

Criteria A2ac+3ce+4ace

Species Information

Description and Life History

The taxon flowers from late March to early June. The timing and amount of flowering is dependent upon late summer rains in the mountains. In years of good summer rains, plants will flower early and in abundance. In years of poor rainfall, plants will flower later in the season and with much lower flowering rates (Backhouse et al. 2016). Of Victorian *Corybas* species, *C. hispidus* is the earliest flowering, usually finishing as the closely related *C. fimbriatus* is just beginning. The hairy and deeply notched, white patch in the middle of the labellum is a conspicuous feature of the species, which distinguishes it readily from *C. fimbriatus* (VicFlora 2015).

After fertilisation, the flower stem elongates, raising the ovary to 20 cm or more above the ground, to aid seed dispersal. Most species reproduce readily by vegetative means and can form large, dense colonies containing hundreds of plants. Pollination is by fungus gnats of the family Mycetophilidae, which are tiny, mosquito-like flies, and it is thought that the flowers mimic the fruiting bodies of fungi, on which the fungus gnats lay their eggs (Backhouse et al. 2016).

Generation Length

The generation length of *Corybas hispidus* is estimated to be 20 to 35 years. The generation time for colony-forming clonal terrestrial orchids is based on the capacity of each clone or genet to persist for decades without reliance on seed germination for population maintenance. Whilst the mortality of clones may occur for a variety of endogenous (genetically determined) or exogenous (environmental) reasons, the clonal replacement is likely to occur at multi-decadal intervals.

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Distribution

The taxon occurs in the drier highland areas in the far north-east and rain shadow areas of the upper Snowy River, and as far west as Yackandandah and Ensay. The altitude range 500-1,100 metres above sea level. The taxon also occurs in ACT, NSW, and Qld (Backhouse et al. 2016).

Habitat

The taxon grows in damp, shady spots in forest on granitic sandy loam and light clay loam soils, often in rocky areas (Backhouse et al. 2016).

Threats

Within its range, the taxon can be locally common and can sometimes form extensive colonies containing many hundreds to thousands of plants. Much of the taxon's potential habitat is fairly remote, steep and difficult to access, and the taxon probably occurs elsewhere in the mountains of eastern Victoria (Backhouse et al. 2016). However, browsing and trampling by Sambar Deer is an increasing threat through the forests of the north-east. An increasingly drier and warmer climate is likely to lead more intense and frequent wildfires.

A few populations are in State forest and could potentially be subject to land management or forestry operations. Spatial analysis of likely habitat for the orchid on all land tenures indicates that 65% occurs within the Comprehensive, Adequate and Representative (CAR) reserve system, including parks and reserves, special protection zones and areas excluded from harvesting by prescription under the Victorian Code of Practice for Timber Production 2014 (the Code). Species-specific protections for the orchid are included in the Code in north-east Forest Management Areas. All known populations are protected from timber harvesting by a 200 metre Special Protection Zone.

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 Vulnerable

The population reduction over the past 60 to 105 years is inferred to be 25 to 55% (midpoint 45%), based on (a) and (c) above.

Past decline is based on some lower-level losses occurring in the Wulgulmerang, Omeo and north-east Victorian regions. However, the majority of the populations occur in conserved land of low agricultural potential.

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

Eligible under Criterion A3 as Vulnerable

The population reduction over the next 60 to 100 years is projected to be 20 to 45%, based on (c) and (e) above.

Nearly all the known populations are conserved. However, the threats posed by climate change and pest animals apply equally in conservation reserves.

Eligible under Criterion A4 as Vulnerable

The population reduction over any 60 to 105 year period, including both past and future (up to 100 years in the future), is estimated to be 25 to 55% (midpoint 45%), 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 (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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 10,276 km² and the Area of Occupancy (AoO) is estimated to be 84 km², but other thresholds under this criterion have not been met.

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 25,000 to 50,000 mature individuals, which exceeds the thresholds for criterion C.

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:

Ineligible under Criterion D

It is estimated that there are 25,000 to 50,000 mature individuals.

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., & Turner, J. (2016). *Bush Gems: A Guide to the Wild Orchids of Victoria, Australia*. Melbourne, Victoria: EBook.

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VicFlora (2015). Flora of Victoria, Royal Botanic Gardens Victoria: *Corybas hispidus*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/a4901156-4d1d-43f2-aa71-6495a99f3990