

Cryptostylis erecta Bonnet Orchid

Taxonomy

Cryptostylis erecta R.Br.

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2001).

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

Proposed conservation status

Endangered in Victoria

Criterion C1

Species Information

Description and Life History

The taxon has leaves 1-several; petioles 1-10 cm long; blades narrowly elliptic, 3-18 cm long, 4-18 mm wide, green on upper surface, reddish-purple beneath, apex acute, base tapering. Flowering stem 10-45 cm tall, sheathing bracts 2 or 3, distant. Flowers 3-12, sessile; sepals and petals greenish, spreading, margins enrolled; sepals linear, acute, average 3 cm long; petals c. 1 cm long. Labellum greenish with bold purplish markings, bonnet-shaped, 20-30 mm long, with marked constriction towards base, very broadly ovate, more or less obtuse, the base horizontal and enclosing column, the broad upper part with a network of conspicuous purplish veins arising from purplish base; inner surface with narrow longitudinal green plate of callus and a few irregular dark purple spots. The taxon flowers from December to April (VicFlora, 2014).

The Bonnet Orchid is a beautiful species that is readily recognised by the large, hooded, reddish purple, striped labellum. It can also be identified when not in flower by the pale green leaves that are purple below. However, in some population's leaves are green above and below, making the leaves virtually indistinguishable from small *Cryptostylis subulata* leaves, although in that species the leaves grow much larger and are leatherier (Backhouse et al., 2016). All five Australian tongue-orchids are pollinated by males of the Red Flower Wasp *Lissopimpla excels* through sexual deception. Interestingly, in eastern Australia there are many sites where at least two species of tongue-orchid (*C. leptochila* and *C. subulata*, or *C. erecta* and *C. hunteriana*) will grow and flower together. Although they have the same pollinator, no hybrids between species of *Cryptostylis* have ever been observed. The leaves are perennial and will reappear the season following fire with flowering generally occurring in the second season following the fire (Backhouse et al., 2016).

Generation Length

The generation length of *Cryptostylis erecta* is inferred 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.

Cryptostylis erecta

Bonnet Orchid

Distribution

The taxon is extremely localised in Victoria, found only near the Wingan and lower Snowy Rivers in East Gippsland (VicFlora, 2014). Altitude range 10 -130 metres ASL. Also occurs in NSW and Queensland (Backhouse et al., 2016).

Habitat

The taxon grows in Spear Grass-tree (*Xanthorrhoea resinosa*) plains and adjacent heathy woodlands and coastal heathland in moist, sandy soils (Backhouse et al., 2016; VicFlora, 2014).

Threats

The bushfires of 2019/2020 are believed to have impacted more than 90% of the taxon's habitat. The taxon is generally tolerant of fire, and the overall impacts of the fire are yet to be determined.

Some plants may have been lost due to housing development in the Marlo area. A population in William Hunter reserve on the edge of Marlo is suffering from habitat drying out, possibly due to water table lowering caused by swamp drainage as part of housing developments in the region. The majority of other populations are secure in Croajingolong National Park and bordering State forest plus crown land. The habitat is under pressure from increased drying and warming as a result of climate change, and also from the impacts of wildfires.

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> <ul style="list-style-type: none"> (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 120 years is estimated to be 10 to 50% (midpoint 30%), based on (c) above.

Cryptostylis erecta Bonnet Orchid

There have possibly been some past losses around Marlo due to housing developments. The bushfires of 2019/2020 are believed to have impacted more than 90% of the taxon's habitat. The taxon is generally tolerant of fire, and the overall impacts of the fire are yet to be determined.

Eligible under Criterion A3 as Vulnerable

The population reduction over the next 60 to 100 years is estimated to be 10 to 30%, based on (c) and (e) above. Although up to 90% of the taxon's habitat may have been impacted by wildfire, the taxon is expected to at least partially recover if the tubers are not disturbed.

Eligible under Criterion A4 as Vulnerable

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 10 to 50% (midpoint 30%), based on (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 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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 1,253 km² and the Area of Occupancy (AoO) is estimated to be 52 km², but other thresholds under this criterion have not been met.

Cryptostylis erecta Bonnet Orchid

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 C as Endangered

It is estimated that there are 600 to 800 mature individuals, based on DELWP records from 2018.

There is estimated to be a continuing decline of 10 to 30% within two generations.

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 Vulnerable

It is estimated that there are 600 to 800 individuals, and 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.



Cryptostylis erecta
Bonnet Orchid

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VicFlora (2014). Flora of Victoria, Royal Botanic Gardens Victoria: *Cryptostylis erecta*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/4151c020-eba8-465c-9e4f-1c334feb4f4b>