

Caladenia cremna Whitfield Spider-orchid

Taxonomy

Caladenia cremna (D.L. Jones) G.N. Backh.

C. cremna is most similar to *C. australis*, which has longer osmophores on all the sepals and more numerous, longer, linear marginal teeth on the labellum (VicFlora 2015).

Current conservation status

Listed as Critically Endangered under the *Environment Protection and Biodiversity Conservation Act 1999*.

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2007).

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

Proposed conservation status

Critically Endangered in Australia

Criteria B1ab(ii,iii,v)+2ab(ii,iii,v); C2a(i,ii); D

Species Information

Description and Life History

The taxon is a flowering plant 15-20 cm tall. Leaf 8-10 cm long, 4-8 mm wide. Flower solitary; perianth segments 2.7-4.5 cm long, pale yellowish with red striae; dorsal sepal erect, lateral sepals and petals divergent, tips drooping; dorsal sepal flattened at base, 2-3 mm wide, tapered to a filiform, clubbed tail, club 4-6 mm long, with dark red-purple, globose, contiguous, sessile glands; lateral sepals flattened at base, 4-6 mm wide, tapered to short filiform clubbed tails, clubs 0.5-1.5 mm long, similar to those of dorsal sepal; petals shorter than sepals, flattened at base, 2-3 mm wide, tapered to an acuminate apex. Labellum curved forward with apex recurved, lamina ovate-lanceolate, obscurely 3-lobed, 15-17 mm long and 9-10 mm wide (when flattened), mostly yellowish with a deep reddish apex; marginal calli on lateral lobes, red, linear, c. 1 mm long, diminishing in size and merging towards the apex; lamina calli in 4 or 6 rows, dull red, not crowded, extending onto base of mid-lobe, foot-shaped, to 1.7 mm long at base of lamina, decreasing in size towards apex. The taxon flowers in October (VicFlora,2015). Flowering may also be promoted by summer bushfires due to the thick understorey in which it grows, which makes searching for plants in intervening years between fires more difficult (Backhouse et al. 2016).

Generation Length

The generation length of *Caladenia cremna* is estimated to be 20 to 40 years (midpoint 30 years). This is not confidently known, however the likely age of first flowering is approximately five years from seed germination. 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.

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Distribution

The taxon is endemic to Victoria and is known from a single site near Cheshunt/Whitfield in the north-east, at an altitude of 530 metres above sea level (Backhouse et al. 2016; VicFlora 2015).

Habitat

The taxon grows on a steep slaty hillside in foothill open forest with a shrubby understorey, on shallow skeletal gravelly clay soils (Backhouse et al. 2016; VicFlora 2015). It seems to be extremely rare and is known only from a single population of less than 10 plants. However, there is potentially suitable habitat in the region, so the taxon could occur elsewhere. The terrain is steep and not easily accessed, making the search for additional populations extremely difficult (Backhouse et al. 2016).

Threats

The key threat to the taxon is its proximity to a road, as the entire known population occurs immediately on the high side of a road cutting. It is therefore likely that the population was adversely impacted when the road was prepared, and will be further impacted by future road maintenance as the likelihood of future road widening is high. Dust generated by roadworks and traffic using the road has the potential to partially smother plant leaves, compromising photosynthesis and reproductive processes.

The main potential threat to the taxon is weed invasion, which is highly likely given the taxon's close proximity to the roadside. Additional potential threats include quarrying, the loss of the specific wasp pollinator, and inappropriate fire regimes. Illegal collection is not currently known to affect the taxon, however this is a potential threat given the ease of accessibility and the small number of plants known to occur. In addition, the potential threat from unintentional trampling by orchid enthusiasts may have a significant impact on this small population, particularly given the fragile nature of the steep cutting. The taxon's response to fire is unknown, however inappropriate intervals between fires may affect recruitment. Additionally, the taxon only occurs in one small area so one intense fire may potentially eliminate the taxon. Climate change may potentially impact the pollinators through drying and warming and create changes to vegetation types favoured by the pollinator.

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 A2 as Endangered

The population reduction over the past 60 to 120 years is estimated to be 30 to 50 %, based on (a) and (c) above.

The taxon is likely to have experienced past decline due to habitat loss.

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 (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 B1 as Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 4 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA). The EoO has been made equal to the AoO to ensure consistency with the definition of AoO as an area within EoO.

The taxon is estimated to have 1 location as all key identified threats apply across its range and can rapidly affect all individuals of the taxon present.

It has a continuing decline in (ii), (iii) and (v) above based on the current and projected impact of the identified threats, notably its proximity to a road and weed invasion.

Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 4 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon has location, and has a continuing decline in (ii), (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 Critically Endangered

It is estimated that there are 4 to 10 mature individuals. The most recent survey conducted in 2015 recorded 35 mature individuals, but in 2019 only four plants were observed after a tree fell onto the site, smothering most of the plants.

The number of mature individuals is estimated to continue to decline, the number of mature individuals in each subpopulation is 50 or fewer, and the percentage of mature individuals in one subpopulation is 90-100%.

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 Critically Endangered

The taxon is estimated to have 4 to 10 mature individuals.

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

References

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