Threatened Species Assessment

Calochilus richiae
Bald-tip Beard-orchid

Taxonomy

Calochilus richiae Nicholls

Current conservation status

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

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1991).

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

Proposed conservation status

Critically Endangered in Australia

Criteria A2c+3ce+4ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C1+2a(i,ii); D

Species Information

Description and Life History

The taxon is a small terrestrial, deciduous herb that emerges annually from a fleshy, irregular subterranean tuber. There is a single basal, stout, fleshy lanceolate leaf that is V-shaped in cross section, ribbed and dark green. The erect flower stem grows to 35 cm tall and has up to five yellowish-green to reddish-brown flowers with darker stripes, in an open raceme. The tepals are up to 15 mm long, while the distinctive labellum is ovate, covered with short purplish calli in the basal two-thirds, while the apex is globous with a narrow, enrolled tip. Plants are dormant from late spring to early autumn, when dormancy is normally broken in response to soaking rains. Flowering occurs in October, and flowers generally remain open for only a few days (Duncan 2010).

Generation Length

The generation length of *Calochilus richiae* is estimated to be 20 to 40 years (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 regenerator reliant on seed-based recruitment for population maintenance.

Distribution

The taxon is endemic to the north-central Goldfields, and is known from a single population of fewer than 20 plants in Whroo Forest near Rushworth, in Victoria (Duncan 2010; VicFlora 2014).

It was first discovered by Mrs Edith Rich of Rushworth in 1928 and described by W. H. Nicholls in 1929. However, it was not relocated until 1968 by field naturalist J. Jamison, when twelve plants were found in an extremely localised area amongst eucalypt leaf litter (Jones 1969). Anecdotal evidence suggests that this population was previously unknown, and that the population known to Mrs Rich has since been destroyed as a result of illegal collection (Duncan 2010).

Habitat

C. richiae grows in Heathy Dry Forest close to the ecotone with Box Ironbark Forest, dominated by *Eucalyptus macrorhyncha, E. polyanthemos,* and *E. tricarpa*. The understorey consists of low shrubs including *Grevillea alpina, Brachyloma daphnoides, Cassinia arcuata,* and occasionally *Xanthorrhoea australis*, with an open grassy ground layer of predominantly *Chionochloa pallida*. Other associated orchids include *Calochilus robertsonii, Caladenia dilatata, C. gracilis* (formerly *C. angustata*), *Thelymitra aristata, T. rubra,* and *Microtis unifolia* (Jones 1969). The population occurs on a gentle south-facing slope, on well drained, shallow, fine sandy loam soil (Duncan 2010).

Threats

Subpopulations and habitat of the taxon are considered at risk from browsing pressure, competition, trampling, and increasingly dry conditions from declining rainfall and the consequent increase in severity and intensity of bushfires. The taxon exists in only one population, therefore it is highly susceptible to stochastic events that may cause 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%

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 Critically Endangered

The population reduction over the past 60 to 120 years is estimated to be 80 to 95 %, based on (c) above.

The past population decline is based on habitat clearing and degradation, and the reduction in the known colony in Rushworth since 1980.

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

Eligible under Criterion A3 as Critically Endangered

The population reduction over the next 60 to 100 years is projected to be 70 to 100 %, based on (c) and (e) above.

Future decline is based on the identified threats, and the survival of the taxon is dependent on conservation actions. Specifically, it is possible that extinction will occur if no conservation actions are continued.

Eligible under Criterion A4 as Critically Endangered

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 80 to 100 %, based on (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 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:

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.

It is estimated to have 1 location as it is known from a single population.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, as a result of climate change and drought

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 1 location, and has a continuing decline in (i), (ii), (iii), (iv) and (v) 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:

Eligible under Criterion C1 as Critically Endangered

It is estimated that there are 10 to 20 mature individuals. This number fluctuates, however recent surveys have not been conducted. In 1980, there were 23 plants recorded, but since 2004 fewer than four plants have been observed.

A continuing decline of 15 to 50 % is estimated to occur within 1 generation.

Eligible under Criterion C2 as Critically Endangered

It is estimated that there are 10 to 20 mature individuals.

The number of mature individuals is projected 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 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:

Eligible under Criterion D as Critically Endangered

The taxon is estimated to have 10 to 20 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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