Threatened Species Assessment

Caladenia colorata
Colourful Spider-orchid

Taxonomy

Caladenia colorata D.L. Jones

Described from South Australia, the status of Victorian populations is not clear, with some possible hybrids, involving *Caladenia formosa* and *C. venusta* s.l. Plants from Victoria are only tentatively placed in *C. colorata* until they are studied in more detail (VicFlora 2019).

This assessment follows VicFlora, which includes all the south-western Victoria and Wimmera plants in *C. colorata*. Other publications have treated these as separate taxa (Backhouse et al. 2016 and DSE 2009).

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 2000).

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

Proposed conservation status

Critically Endangered in Victoria

Criterion A2ace

Species Information

Description and Life History

The majority of *Caladenia* species are terrestrial, deciduous herbs which emerge annually from spherical, subterranean tubers protected by a tough, fibrous tunic. These tubers are replaced annually and are dormant during the drier summer months. Dormancy is broken in response to soaking rains in early autumn, and the plants produce a single, basal leaf which is generally long, narrow and conspicuously hairy. This leaf remains almost dormant throughout the winter.

Plants flower in September and October with mature seed produced in November. The fruits usually take 5-8 weeks to mature following pollination. Each mature capsule may contain tens of thousands of microscopic seeds which are dispersed by the wind when the capsule dries out. Pollination occurs via sexual deception through the process of pseudocopulation. Spider orchids are characterised by their often large, attractive flowers with long tapering sepals and petals with a dense apical covering of glands. These glands emit pheromones which attract pollinators, usually male thynnid wasps (Backhouse and Jeanes 1995). Once attracted to a flower, the male wasp usually attempts to copulate with the labellum, mistaking it for a female wasp, and effecting pollination.

Generation Length

The generation length of *Caladenia colorata* is estimated 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.

Distribution

The taxon is known currently from a few localities in far western Victoria between the lower Glenelg River and the western block of the Little Desert National Park, in woodlands on sandy soils (VicFlora 2019).

Habitat

The Colourful Spider-orchid occurs in an open area in low, mixed Swamp Gum (*Eucalyptus ovata)* /Brown Stringybark (*E. baxteri*) / Messmate Stringybark (*E. obliqua*) woodland. The heathy understorey contains Prickly Moses (*Acacia verticillata*), Myrtle Wattle (*A. myrtifolia*), Flame Heath (*Astroloma conostephioides*), Horny Conebush (*Isopogon ceratophyllus*), Sweet Bursaria (*Bursaria spinosa*), Moonah (*Melaleuca lanceolata*), Sticky Hop-bush (*Dodonaea viscosa*) and sedge species. The population is growing on calcareous sands and sandy loams derived from limestone, with areas of exposed limestone rock (DSE 2009, Backhouse et al. 2016).

Threats

The taxon is directly threatened by grazing (rabbits; invertebrates and native herbivores) and inappropriate fire regimes. The risk of lack of recruitment due to absence of pollinator and fungal activity on the soil. There is a high risk of extinction due to the small area of occupancy.

The population may be at risk from inadvertent damage or trampling by orchid enthusiasts who may visit the site.

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 50 to 80%, based on (a), (c) and (e) above.

This is based on habitat loss, particularly in the Wimmera.

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 estimated to be 40%, based on (c) and (e) above.

Due to ongoing threats outlined in DSE 2009 the species, in the absence of ongoing cultivation and reintroduction (Backhouse et al. 2016), is likely to suffer ongoing decline.

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 estimated to be 40 to 70% 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 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 B as Endangered

The Extent of Occurrence (EoO) is estimated to be 3,774 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The Area of Occupancy (AoO) is estimated to be 20 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is considered to occur in two locations as all key identified threats apply across both sites, and can rapidly affect all individuals of the taxon present.

It 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 C as Endangered

It is estimated that there are 600 to 1,200 mature individuals. This is based on data from DSE (2009) and D. Rouse pers. obs.

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

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 Vulnerable

It is estimated that there are 600 to 1,200 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.

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