Threatened Species Assessment

Caladenia clavescens
Castlemaine Spider-orchid

Taxonomy

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

The taxon was previously known as *Caladenia* sp. aff. *concolor 3* (Backhouse 2007). Prior to 2007, populations of *Caladenia clavescens* were grouped into the *Caladenia* sp. aff. *concolor* cluster that were located across a vast area of central Victoria. Revised in 2007, the *Caladenia clavescens* locations are now restricted to box-ironbark forest in the Castlemaine region.

Current conservation status

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

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

Proposed conservation status

Critically Endangered in Australia

Criteria A3ce+4ce; C1+2a(ii)

Species Information

Description and Life History

The taxon is a flowering plant 20-35 cm tall. Leaf 8-14 cm long, 6-12 mm wide. Flower usually solitary, sometimes 2; perianth segments 3.5-6.5 cm long, dark red to maroon, sometimes cream or pinkish; sepals flattened at base, 3-4 mm wide, gradually tapered to a long tail, sometimes somewhat expanded and club-like, densely covered distally in crowded ovoid to cylindric glands; petals shorter than sepals but otherwise similar. Labellum curved forward with apex recurved and lateral lobes erect, lamina broadly ovate-lanceolate, obscurely 3-lobed, 14-18 mm long and 8-11 mm wide (when flattened), dark purplish; margins of lateral lobes fringed with linear calli to 1.8 mm long; margins of mid-lobe with shorter calli extending to the labellum apex, or margins becoming entire towards apex; lamina calli in 4 or 6 rows, extending well onto the mid-lobe, narrow, foot-shaped, c. 2 mm long at base of lamina, decreasing in size towards apex. The taxon flowers from Sep.-Oct. (VicFlora 2019).

Generation Length

The generation length of *Caladenia clavescens* is estimated to be 20 to 40 (midpoint 30) years. The generation time for non-colonial terrestrial orchids is estimated 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 that are likely to result in replacement at intervals of several decades only. Such orchids are classed as obligate seed regenerators (OSRs), meaning they are reliant on seed-based recruitment for population maintenance.

Long-term observation and monitoring of populations of terrestrial orchids in general suggests very low recruitment over decades, and individual plants may be very long-lived, possibly several decades. In addition, populations of orchid taxa occurring within wetter, more densely vegetated forests may take longer to establish due to factors such as germination opportunities and seedling establishment.

Distribution

The taxon is a Victorian endemic, and the main populated area is within the Chewton/Castlemaine district of central Victoria. Outlying locations cover small areas and population density, with some of these outliers only consisting of 1-12 individuals.

Habitat

The taxon typically occurs in Heathy Dry Forest and Valley Grassy Forest dominated by Red box, Long Leaf Box and Red Stringy Bark, at 300-350 m altitude.

Threats

The box-ironbark forest habitat of this taxon has suffered from a long history of disturbance and depletion. Most current sites are in forests regenerating from extensive past timber harvesting and gold mining. The subpopulations and the habitat are considered at risk from human visitation/trampling, habitat fragmentation and low genetic diversity, site degradation due to macropod browsing pressure, inappropriate fire regimes and increasingly dry conditions from declining rainfall and consequent increase in severity and intensity of bushfires. In addition, very small subpopulations are highly susceptible to stochastic events causing major decline or local extinction within a very short time frame.

Spatial analysis of likely habitat for the taxon on all land tenures indicates that 6% occurs within the 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 taxon are included in the Code. Other more general prescriptions also provide protection from timber harvesting.

The majority of the likely habitat for this taxon occurs on private land; it should be noted that the Victorian Planning Provisions regulate the clearing of native vegetation on private land in Victoria and include tighter restrictions in cases involving the habitat of threatened species.

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 Endangered

The population reduction over the past 60 to 120 years is estimated to be 50 to 70%, based on (c) and (e) above.

This is based on habitat clearing and degradation; currently there are only small patches of habitat remaining.

Eligible under Criterion A3 as Critically Endangered

The population reduction over the next 60 to 100 years is suspected to be 60 to 90%, based on (c) and (e) above.

The recent conservation efforts have seen the taxon increase through reintroductions; however, these are not yet old enough or sustainable enough to be considered a part of the population and they are not likely to survive into the future. As the taxon still dependent on conservation actions, the chance of future decline has been taken into consideration. In a worst-case scenario, the taxon could decline to extinction in the wild.

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 suspected to be 50 to 100%, based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

The past population decline is estimated based on habitat clearing and degradation, and currently there are very small patches of habitat remaining. The recent conservation efforts have seen the taxon increase through reintroductions, which are not yet considered successful. As the taxon is still dependent on conservation actions, the chance of future decline has been taken into consideration.

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 3,620 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The Area of Occupancy (AoO) is estimated to be 112 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

The taxon is severely fragmented and has a continuing decline in (i), (ii), (iii), (iv) and (v).

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 Endangered

It is estimated that there are 540 to 660 mature individuals. Monitoring of all known populations at the lowest count for each population is the lower end of the estimate, the mid-range is the actual count of known individuals at the highest count of each known population and the higher estimate takes in to account estimated number of individuals that are not detected in counts.

A continuing decline of 40 to 90% is estimated to occur 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 540 to 660 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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