Threatened Species Assessment

Caladenia concolor
Crimson Spider-orchid

Taxonomy

Caladenia concolor Fitzg.

The taxonomic definition of the taxon is currently unclear, with some confusion existing over its current and former distribution and population size. Populations in the Bendigo, Castlemaine, and Broadford areas need determination.

Current conservation status

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

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1996).

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

Proposed conservation status

Endangered in Victoria

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

Species Information

Description and Life History

The taxon is flowering plant 15-25 cm tall. Leaf 8-15 cm long, 8-10 mm wide. Flowers 1 or 2; perianth segments 2.5-4 cm long, dark purplish-red to crimson; sepals flattened at base, 2-3 mm wide, gradually tapered to a long tail, densely covered in crowded, ovoid to ellipsoid glands; petals shorter than sepals but otherwise similar. Labellum curved forward with apex recurved and lateral lobes erect, lamina ovate to broadly ovate-lanceolate, obscurely 3-lobed, 11-13 mm long, 8-10 mm wide (when flattened), dark purplish-red; margins of lateral lobes fringed with linear calli to 1 mm long; margins of mid-lobe with shorter calli becoming fused towards tip; lamina calli in 4 crowded rows, the central rows extending well onto 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 2018).

Generation Length

The generation length of *Caladenia concolor* 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.

Distribution

The taxon occurs in Victoria in the Beechworth and Chiltern areas within the Victorian Northern Inland Slopes Bioregion. Additional populations are thought to occur in the Central Victorian Uplands Bioregion in the Broadford/Tyaak area. Records from the Goldfields Region in the Bendigo and Castlemaine areas are doubtful (D. Rouse pers. comm.), as are those from the Cootamundra and Tumbarumba areas in NSW (D. Jones pers. comm.).

Historically, the taxon was found in north-eastern and southern central Victoria and southern NSW. Specifically, it was scattered across central and eastern parts of the goldfields between Albury and the Loddon River (Coates et al. 2002).

Habitat

In Victoria, the taxon occurs in a range of habitats including Box -Ironbark open forests (usually *Eucalyptus goniocalyx, E. macrorhyncha*, *E. polyanthemos*, *E. sideroxylon*) on well-drained, gravelly or stony sand and clay loam. The understorey typically consists of scattered heathy shrubs and grasses such as *Brachyloma ciliatum, Platylobium formosum*, *Dillwynia phylicoides, Hibbertia riparia* and *Joycea pallida*.

Threats

Current threats include limited or absent natural pollination, weed invasion or competition, native macropod grazing, browsing and soil disturbance impacts from exotic animals including rabbits, deer and, to a lesser extent, pigs. The taxon is also threatened by inappropriate fire regimes, disturbance due to uncontrolled access, road and track maintenance and illegal collection (Coates et al. 2002). There may have been past declines as a result of land clearing and forestry operations. More details on threats are provided in the Flora and Fauna Guarantee action statement (DSE 2003).

Spatial analysis of likely habitat for the taxon on all land tenures indicates that 27% occurs within the Comprehensive, Adequate and Representative (CAR) reserve system, including parks, reserves and special protection zones in State forest. Species-specific protections for the taxon are included in the Victorian Code of Practice for Timber Production 2014. Most of the remaining likely habitat 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:

Ineligible under Criterion A

There is insufficient evidence to determine whether there has been or will be a reduction in population sufficient to meet any threshold for Criterion A.

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 Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 4,604 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

Considering the limited dispersal ability of the taxon, the barriers to dispersal, or lack of habitat separating them, the individuals can be considered to be severely fragmented.

It is estimated to have a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the current and projected impact of the identified threats, including an absence of natural pollination, grazing, inappropriate fire regimes, and exotic annual grasses.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 56 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, the taxon is estimated to be severely fragmented 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 C2 as Endangered

It is estimated that there are 170 to 200 mature individuals. This is based on results of annual searches at various sites in Victoria since 1992.

The number of mature individuals is estimated to continue to decline, and the number of mature individuals in each subpopulation is fewer than 250.

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 Endangered

The taxon is estimated to have 170 to 200 mature individuals.

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

References

Coates, F., Jeanes, J. & Pritchard, A. (2002). Recovery Plan for Twenty-five Threatened Orchids of Victoria, South Australia and New South Wales 2003 - 2007. Department of Natural Resources and Environment, Melbourne.

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DEPI (2014) *Advisory list of rare or threatened plants in Victoria - 2014.* Department of Environment and Primary Industries, Melbourne. Retrieved from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf

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