

## *Caladenia oenochila* Wine-lipped Spider-orchid

### Taxonomy

*Caladenia oenochila* G.W. Carr

Hybrids between *Caladenia oenochila* and a taxon from the *C. dilatata* group are known near Officer (VicFlora 2018).

### Current conservation status

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

### Proposed conservation status

Critically Endangered in Victoria

Criteria A2ace+3ce+4ace

The taxon is known from at least 38 mostly small subpopulations occurring at 4 widely separated locations, with a total of fewer than 1,200 plants. At least 16 subpopulations have been lost in the last 90 years, and many subpopulations are in decline.

### Species Information

#### Description and Life History

Stem to 40 cm tall, sepals to 55 mm long, petals to 45 mm long. Colour is highly variable; creamy white to pale yellowish to reddish with reddish brown tails, labellum usually dark reddish with a yellowish, red-striped base (occasionally white to yellow, sometimes with variable red shadings), lamina calli and marginal teeth dark reddish often with pale tips. A medium-sized, variably coloured long-tailed spider-orchid with 1-2 flowers with slender, stiffly deflexed to drooping petals and lateral sepals with slender to moderately thick, almost club-like tails, and a relatively large labellum with relatively sparse calli extending onto the mid-lobe, the margins with short, thick teeth progressively decreasing in size to serrations on the mid-lobe (Backhouse et al. 2016).

The taxon flowers in September and October, and flowering can be enhanced dramatically by summer fires (VicFlora 2018).

Spider-orchids, in general, use either food deception or sexual deception for pollination, the usual pollinator is male wasps from the family Thynnidae. A scent that mimics female thynnid wasp pheromone is produced by the glandular tips of the sepals and acts as a sexual attractant for the pollinators. Once the pollinator reaches the flower, it attempts to copulate with the labellum of the flower, mistaking it for the female wasp, and effects pollination (DSE 2000).

Spider-orchids generally reproduce from seed. The fruits normally take 5-8 weeks to reach maturity following pollination and each mature capsule may contain tens of thousands of microscopic seeds that are dispersed by the wind when the capsule dries out. Most spider-orchids grow in a complex relationship with mycorrhizal fungi which is critical for growth and development. The fungus assimilates some nutrients for the orchid, but the degree of nutritional dependence upon the fungus by spider-orchids is not clearly understood. Some spider-orchids have survived for at least 17 years in the wild, however longevity of most taxa is not known (DSE 2000).

Most terrestrial orchids have evolved under conditions of hot summer fires, generally when the plants have been dormant. Some *Caladenia* taxa flower vigorously following hot summer fires, but this may be as much the result of



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the removal of surrounding vegetation and reduced competition as any chemical effect of the fire. The timing of fire is important, with the best time during late summer or early autumn, after seed dispersal but prior to new plant emergence. Rainfall and temperature also influences flowering. Flowering is often aborted when periods of sustained hot, dry weather follow flower opening (DSE 2000).

## Generation Length

The generation length of *Caladenia oenochila* 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 endemic to Victoria, where it is widely but patchily distributed mostly in the south between Warragul and Lorne, with occasional island occurrences (Euroa, Grampians). The altitude range is from 80-650 metres above sea level (ASL). This is an uncommon taxon largely restricted to southern Victoria, with most populations occurring within 100 km of Melbourne. Almost all (33 out of 38) of the remaining subpopulations occur in the outer north-eastern, eastern and south-eastern suburbs of Melbourne, where most occur in small fragmented patches of remaining habitat.

It has a curiously disjunct distribution, and outlying populations in northern Victoria (e.g. Strathbogie Range near Euroa and Serra Range in the Grampians) possibly represent other, unnamed taxon. Given the wide distribution of remaining subpopulations, it was once almost certainly much more common than current records indicate

## Habitat

The taxon is relatively common in moist, often grassy, open forest or woodland, often in shaded habitats. It occurs on sandy to clay loam, occasionally gravelly, soils (Backhouse et al. 2016; VicFlora 2018).

## Threats

Most subpopulations and the habitat are considered at risk from disturbance, predation, weed invasion and increasingly dry conditions from declining rainfall. Only 2 subpopulations (the Grampians and Anglesea) occur in large bushland areas that offer some hope of long-term survival. Very small subpopulations are highly susceptible to stochastic events causing 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%
<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> <ul style="list-style-type: none"> <li>(a) direct observation [except A3]</li> <li>(b) an index of abundance appropriate to the taxon</li> <li>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</li> <li>(d) actual or potential levels of exploitation</li> <li>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</li> </ul>			

### Evidence:

#### Eligible under Criterion A2 as Critically Endangered

The population reduction over the past 60 to 120 years is inferred to be 60 to 90 (midpoint 70)%, based on (a), (c) and (e) above.

Past decline is based on the known loss of subpopulations and extensive loss of habitat. There has been a substantial historical decline in distribution and abundance of the taxon, with at least 16 subpopulations lost in the last 90 years.

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 65 to 95%, based on (c) and (e) above.

There are ongoing declines in, and the likely extinctions of, many subpopulations. Most subpopulations and habitat are considered at risk from disturbance, predation, weed invasion and increasingly dry conditions from declining rainfall.

#### 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 inferred to be 60 to 99%, based on (a), (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

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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 km <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
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 Area of Occupancy (AoO) is estimated to be 152 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

Any two of (a), (b) or (c) above are also satisfied.

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 <u>C1</u> or <u>C2</u>				
<u>C1</u>	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)
<u>C2</u>	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

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It is estimated that there are 600 to 1,200 mature individuals. The taxon is known from at least 38 mostly small subpopulations occurring at 4 widely separated locations, with a total of fewer than 1,200 plants.

There is estimated to be a continuing decline of 30 to 45% within two generations.

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

Criterion D - Very small or restricted population <sup>Ⓜ</sup>			
<sup>Ⓜ</sup>	Critically Endangered <sup>Ⓜ</sup>	Endangered <sup>Ⓜ</sup>	Vulnerable <sup>Ⓜ</sup>
Number of mature individuals (observed or estimated) <sup>Ⓜ</sup>	<50 <sup>Ⓜ</sup>	<250 <sup>Ⓜ</sup>	<1,000 <sup>Ⓜ</sup>
D2 - Only applies to the VU category <sup>Ⓜ</sup> 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. <sup>Ⓜ</sup>	- <sup>Ⓜ</sup>	- <sup>Ⓜ</sup>	D2 - Typically: <sup>Ⓜ</sup> AoO < 20 km <sup>2</sup> or number of locations ≤ 5 <sup>Ⓜ</sup>

### 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.**

### References

Backhouse, G., Kosky, B., Rouse, D., and Turner, J. (2016). *Bush Gems: A Guide to the Wild Orchids of Victoria, Australia*. Melbourne, Victoria: EBook.

VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Caladenia oenochila*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/57231227-b5b5-4e6c-b6b4-541ddffc35c3>