

## *Caladenia fragrantissima* Scented Spider-orchid

### Taxonomy

*Caladenia fragrantissima* D.L. Jones & G.W. Carr

### Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988*. (SAC 2001).

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

### Proposed conservation status

Critically Endangered in Victoria

Criterion B1ab(i,ii,iii,iv,v)

### Species Information

#### Description and Life History

The taxon is an elegant, spring flowering terrestrial deciduous orchid. Flowering plant 20-40 cm tall. Has a single, very hairy green lanceolate leaf 6-10 cm long, 10-15 mm wide. Flowers 1-3, strongly scented; perianth segments 5-8 cm long, creamy white (with occasional flowers pink to reddish) to yellowish green with dark red to blackish glandular tips. Sepals and petals about 8 cm long, broad and flattened at base but tapering to long slender tails. Sepals flattened at base, 2-4 mm wide, abruptly tapered to a long tail densely covered in glands and/or reddish to black glandular hairs; petals shorter than sepals but otherwise similar. Labellum usually white, curved forward with apex recurved and lateral lobes erect, lamina ovate, obscurely 3-lobed, 16-20 mm long and 8-10 mm wide (when flattened), cream with red blackish margins and red calli; margins of lateral lobes fringed with pale-tipped, linear calli to 1.5 mm long, margins of mid-lobe with shorter calli becoming tooth-like near tip; lamina calli in 4 or 6 somewhat crowded rows, extending onto mid-lobe, narrow, foot-shaped, c. 1.3 mm long at base of lamina, decreasing in size towards apex. The taxon flowers from September to November (VicFlora 2017).

Within the known small populations there is considerable variation in size and colour, from mostly creamy white to almost wholly red. The taxon is supposed to be strongly scented, although fragrance varies with age of the flowers and ambient temperature and is not a reliable guide to identification (Backhouse et al. 2016).

#### Generation Length

The generation length of *Caladenia fragrantissima* is estimated to be 20 to 40 (midpoint 30) years. This is based on the generation time for non-colonial terrestrial orchids, that is estimated to be a nominal 30 years based on the annual replacement of the mother tuber by daughter tubers. Whilst somatically immortal, individuals are 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

In Victoria, the taxon is known only from the vicinity between Nelson and Portland in the far south-west of the State (Backhouse et al. 2016; VicFlora 2017). The taxon also occurs in South Australia. There are several old records from around Portland which cannot be relocated, and it is presumed extinct at those localities (SAC 2001).

# Caladenia fragrantissima

## Scented Spider-orchid

### Habitat

The taxon grows in open coastal and near-coastal heath or heathy woodland on well-drained sandy loam soils. The altitude range is from 120-140 metres above sea level (Backhouse et al. 2016; SAC 2001).

### Threats

There has been a historic decline in distribution and abundance, with the loss of at least 3 subpopulations at Portland, Gorae West and Bridgewater Lakes. Another 3 subpopulations, at Bats Ridge and Mt Richmond, were very small, with only a few plants each. No plants have been seen at any of these subpopulations for several years and it is likely that these have recently become extinct. A considerable amount of habitat within its range has been cleared or degraded, and 5 records of this taxon from near Portland, all prior to 1942, apparently no longer exist.

Subpopulations and habitat are considered at risk from disturbance, weed invasion and increasingly dry conditions from declining rainfall and consequent increase in severity and intensity of bushfires. While most remaining plants and habitat are protected in the Discovery Bay Coastal Park, some decline is continuing in a couple of the larger subpopulations, from disturbance caused by off-road vehicles and weeds. Very small subpopulations are highly susceptible to stochastic events causing major decline or local extinction within a very short time frame.

Within Mt Richmond National Park, part of the population was destroyed during track maintenance works. One population, on private land, consists of only about 10 plants and is subject to cattle grazing. Invasion of coastal heaths and heathy woodland by *Acacia longifolia* subsp. *sophorae* is a potential threat to most populations, especially the largest, at Swan Lake. Fire ecology of heathland habitats may be an important issue, with timing and frequency of fires possibly important in influencing flowering. Rabbits are also present and grazing plants in most populations.

### 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>	<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>
--	---------------------------------------	---

# Caladenia fragrantissima

## Scented Spider-orchid

### Evidence:

#### Eligible under Criterion A3 as Vulnerable

The population reduction over the next 60 to 100 years is projected to be 20 to 35%, based on (c) and (e) above.

Future decline is based on declining subpopulations and habitat conditions which are considered at risk from disturbance, weed invasion and increasingly dry conditions from declining rainfall and a consequent increase in the severity and intensity of bushfires. Very small subpopulations are highly susceptible to stochastic events causing major decline or local extinction within a very short time frame.

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 B1 as Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 48 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas.

The EoO has been made equal to the AoO to ensure consistency with the definition of AoO as an area within EoO.

The taxon is estimated to be severely fragmented. The taxon is known only from 12 mostly small subpopulations occurring at a single location. The taxon is considered to be severely fragmented because of its limited dispersal ability, isolation and lack of habitat between some subpopulations, with a reduced probability of recolonisation should subpopulations become extinct. This results in an increased extinction risk to the taxon.

It is estimated to have 1 location. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above. The subpopulations and habitat are considered at risk from disturbance, weed invasion and increasingly dry conditions from declining rainfall and consequent increase in severity and intensity of bushfires.

#### Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 48 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has 1 location and has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

# Caladenia fragrantissima

## Scented Spider-orchid

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 640 to 1,300 mature individuals. VBA records and sporadic surveys indicate that the taxon is known from at least 12 subpopulations, with fewer than 1300 plants.

There is projected to be a continuing decline of 15 to 35% within two generations.

Criterion D. Very small or restricted populations				
		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 km <sup>2</sup> or number of locations ≤ 5

### Evidence:

#### Eligible under criterion D as Vulnerable

It is estimated that there are 640 to 1,300 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., and Jeanes, J. (1995). *The Orchids of Victoria*. Melbourne, Victoria: Melbourne University Press.



# *Caladenia fragrantissima* Scented Spider-orchid

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

DEPI (2014) *Advisory list of rare or threatened plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne.

Ross, J.H. (2000). *A Census of the Vascular Plants of Victoria* (6th edition). Melbourne: Royal Botanic Gardens.

SAC (2001). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 351 *Caladenia fragrantissima*.

VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Caladenia fragrantissima*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/5e0b1dc8-b312-48e5-bfc7-60527b89e1fe>