

Threatened Species Assessment



Caladenia maritima Angahook Pink-fingers

Taxonomy

Caladenia maritima D.L. Jones

There is potential confusion in identification between *Caladenia maritima* and *C. catenata*. *C. maritima* forms a rare hybrid with *C. carnea* (Backhouse et al. 2016).

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2012).

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

Proposed conservation status

Critically Endangered in Australia

Criteria B1ab(iii,v)+2ab(iii,v)

Species Information

Description and Life History

The taxon is a flowering plant slender, 10-20 cm tall. Leaf linear, 6-15 cm long, 1-2.5 mm wide, almost hairless. Flower solitary, white, labellum with purplish stains and transverse bars and an orange tip; dorsal sepal erect or reflexed, linear-oblong, 10-15 mm long; lateral sepals 13-17 mm long, spreading, slightly oblique, narrowly elliptic; petals spreading, 12-15 mm long. Labellum sessile, 3-lobed, 7-9 mm long, 5.5-7.5 mm wide (when flattened), white, lateral lobes narrow, obtuse, margins entire; mid-lobe triangular, recurved, longer than lateral lobes, orange-yellow at the apex, margins with finger-like teeth; lamina calli in 2 rows extending to base of mid-lobe, elongate, mostly clubbed, yellow or white. Column incurved, winged throughout, broader towards tip, inside greenish, often with a band of maroon or red in middle region; anther with a short point. The taxon flowers from September to October (VicFlora 2018).

Anecdotal evidence suggests that reproduction and recruitment within the taxon is low. Analysis of monitoring data shows very little natural pollination and seed production (SAC 2012).

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



Caladenia maritima Angahook Pink-fingers

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 *C. maritima* 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, 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

First discovered in 1998, the taxon is apparently rare and endemic to Victoria. It is known from a single population of about 100 plants from Angahook-Lorne State Park on the south coast near Anglesea in the Victorian Otway Plain Bioregion (Backhouse et al. 2016; VicFlora 2018).

Formerly very rare or absence from the district, *C. catenata* is now being seen with increasing frequency around Anglesea, so there is potential confusion in identification between the two (Backhouse et al. 2016).

Habitat

The taxon occurs in stunted heathy open forest on well-drained, dark grey sandy loam (VicFlora 2018). It occurs at an altitude of 55 metres above sea level (Backhouse et al. 2016). There is an overstorey of *Eucalyptus obliqua* (Messmate) with a healthy understorey dominated by *Xanthorrhoea australis* (Austral Grass-tree), *Hibbertia sericea* and *Leptospermum myrsinoides* (Silky Teatree) (SAC 2012; DSE 2004).

Threats

There is a considerable area of heathy woodland (i.e., potential habitat) in the region, and it is possible that other populations of *C. maritima* exist in the district. However, as of 2012, annual spring surveying was yet to identify any new populations (SAC 2012).

The site is situated along a walking track and suffers from disturbance. The habitat has been affected by dieback. It is also likely that habitat has been affected by drying conditions from reduced rainfall. All of these impacts are likely to continue. Future reduction predicted based on declining habitat quality and disturbance, unless there is active and sustained management intervention.

The taxon is at risk from numerous threatening processes including accidental damage, altered fire regimes, herbivory by rabbits, illegal collection, low pollination levels, weed invasion, specifically by Boneseed (*Chrysanthemoides monilifera*) and Sallow Wattle (*Acacia longifolia* var. *longifolia*) and *Phytophthora cinnamomi* infection. The conditions for the maintenance of the pollinator and fungal activity is unknown, therefore there is an increased risk to the taxon due to its single population. Furthermore, is confined to an area subject to multiple uses with limited site protection (DSE 2004; SAC 2012).

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"> (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 30 to 40%, based on (a) above.

The single subpopulation appears to have declined in numbers over the last decade. The population size was estimated at 500 plants in 2004 and the current population size has been estimated at less than 300 plants.

Eligible under Criterion A3 as Endangered

The population reduction over the next 60 to 100 years is suspected to be 40 to 90% (likely 50)%, based on (c) and (e) above.

Future decline is based on the declining habitat quality and disturbance, unless there is active and sustained management intervention.

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 inferred to be 40 to 90 (likely 50)%, based on (a), (c) and (e) above.

Caladenia maritima Angahook Pink-fingers

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 ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 4 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA). 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, as it known from just a single location and subpopulation which precludes the possibility of recolonisation should this subpopulation become extinct.

It is estimated to have 1 location. It has a continuing decline in (iii) and (v) above based on the declining habitat quality and disturbance, unless there is active and sustained management intervention.

Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 4 km², 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 (iii) and (v) above.

Caladenia maritima Angahook Pink-fingers

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 200 to 500 (midpoint 300) mature individuals. The population size was estimated at 500 plants in 2004. The current population size has been estimated at less than 300 plants.

There is an inferred continuing decline, and the percentage of mature individuals in one subpopulation is 100%.

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 ² or number of locations ≤ 5

Evidence:

Eligible under criterion D as Vulnerable

It is estimated that there are 200 to 500 (midpoint 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

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Caladenia maritima Angahook Pink-fingers

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