Threatened Species Assessment

Caladenia aestiva
Summer Spider-orchid

Taxonomy

Caladenia aestiva D.L. Jones

The taxon is also referred to as Mountain Summer Spider-orchid (Backhouse et al. 2016).

The taxon is similar to *C. flavovirens*. The true distribution of *C. aestiva* is somewhat obscured by confusion with *C. flavovirens*. It may be distinguished from the closely related *C. flavovirens* by its mountainous habitat, generally smaller flowers and the presence of obvious flattened clubs on the sepal tips. Furthermore, it has been confused with *C. pallida,* which is now considered to be Tasmanian endemic (VicFlora 2018).

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criterion A2ace+3ce+4ace; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C2a(i); D

Species Information

Description and Life History

The taxon is a flowering plant 25-32 cm tall. Leaf 10-20 cm long, 4-7 mm wide. Flowers 1 or 2; perianth segments 3-5 cm long, pale greenish-yellow to pale yellow, lateral sepals and petals divergent; sepals flattened at base, 3-5 mm wide, abruptly tapered to a filiform, clubbed tail, club 3-14 mm long, with closely spaced but not contiguous, sessile glands; petals shorter than sepals, flattened at base, tapered to long acuminate apex, usually glandular, sometimes clubbed. Labellum curved forward with apex recurved and lateral lobes erect, lamina ovate, obscurely 3-lobed, 13-18 mm long and 10-12 mm wide (when flattened), greenish-yellow or yellow, sometimes with prominent dark red mid-lobe; marginal calli on lateral lobes scimitar-shaped, to 2 mm long, on mid-lobe shorter and saw-like; lamina calli in 4 or 6 rows, not extending far onto mid-lobe, narrow, foot-shaped, c. 2 mm long at base of lamina, decreasing in size towards apex. The taxon flowers from December to January. Flowering is enhanced by fire (VicFlora 2018).

Generation Length

The generation length of *Caladenia aestiva* 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 occurs in the mountains of eastern Victoria between Billabong, Towong and Wulhulmerang (Backhouse et al. 2016). It also occurs in New South Wales and Australian Capital Territory. It is an uncommon orchid that has been seen in recent years only in the Cobungra and Wulhulmerang regions, where it is usually encountered as

dispersed plants in small, scattered populations. However, it grows in remote poorly accessible mountainous region, so it may be underreported (Backhouse et al. 2016).

It is rare in Victoria and seldom encountered in the field. It tends to grow as widely separated, loose colonies, which may contain dozens of plants. Flowering is strongly promoted by the occurrence of hot fires during the previous summer. It is represented in the Alpine National Park and possibly other smaller parks and reserves, but its conservation status and distribution are poorly known due to confusion with other taxa (Backhouse and Jeanes 1995).

Habitat

The taxon occurs in sub-alpine and montane parts of the Eastern Highlands, the altitude range is 950-1200 metres above sea level (Backhouse et al. 2016). The taxon grows in damp, shaded ridges and slopes in shrubby open forest and woodlands, on well-drained heavy loam soils. It grows among grasses and low herbaceous and shrubby vegetation, often on north- and west-facing slopes (Backhouse and Jeanes 1995; Backhouse et al. 2016; VicFlora 2018).

Threats

There has been a decline in distribution and abundance, with the apparent loss of at least 2 subpopulations, from Cravensville and Benambra, most likely due to degradation of habitat. At least 2 remaining subpopulations are in decline from cattle and feral horse grazing and trampling. All subpopulations and habitat are considered at risk from increasingly dry conditions from declining rainfall. 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%

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 inferred to be 50 to 70% based on (a), (c) and (e) above.

Past decline is based on a significant decline in distribution and abundance, with the apparent loss of at least two subpopulations. This most likely due to extensive loss and degradation of the habitat.

The causes of reduction may not have ceased, be understood or be reversible.

Eligible under Criterion A3 as Endangered

The population reduction over the next 60 to 100 years is estimated to be 35 to 65% (midpoint 50%) based on (c) and (e) above.

Future decline is based on the current and projected threats of cattle and feral horse grazing and trampling. All subpopulations and habitat are considered at risk from increasingly dry conditions from declining rainfall. Very small subpopulations are highly susceptible to stochastic events causing major decline or local extinction within a very short time frame.

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 estimated to be 40 to 75%, based on (a), (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 a significant decline in distribution and abundance, with the apparent loss of at least two subpopulations. This most likely due to extensive loss and degradation of the habitat.

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

The Area of Occupancy (AoO) is estimated to be 32 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

The taxon is considered to be severely fragmented because of its limited dispersal ability and the isolation of subpopulations from one another, with a reduced probability of recolonisation should subpopulations become extinct, resulting in an increased extinction risk to the taxon.

All subpopulations occur in the mountain of East Gippsland, which is deemed as a single location because the identified threats apply across the range of the taxon and can rapidly affect all individuals of the taxon present.

It has a continuing decline in ()(i), (ii), (iii), (iv?0 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 110 to 200 mature individuals.

The number of mature individuals is estimated to continue to decline based on the current and projected threats of cattle and feral horse grazing and trampling. All subpopulations and habitat are considered at risk from increasingly dry conditions from declining rainfall. Very small subpopulations are highly susceptible to stochastic events causing major decline or local extinction within a very short time frame.

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

It is estimated that there are 110 to 200 mature individuals.

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.

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Turner, J., Bould, A., and Wilkinson, J. (2014). *Orchids of East Gippsland: A Field Guide.* Bairnsdale: Bairnsdale and District Field Naturalists Club Inc.

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