Threatened Species Assessment

Caleana disjuncta
Grampians Duck-orchid

Taxonomy

Caleana disjuncta D.L. Jones

The taxon is also referred as *Caleana* sp. aff. *nigrita* J. Drumm. ex Lindl (Horsham) (SAC 1998). The closest ally is undescribed but illegally published by Hoffman and Brown as *C.linariifolia* (Orchids of SWA).

The taxon was, until very recently, known as *Paracaleana disjuncta* but was placed in the genus *Caleana* in 2014. It was first recorded in South Australia in 1966, and was then identified as *Caleana nigrita*, a species otherwise known from Western Australia. A new, undescribed *Caleana* species was collected near Esperance in Western Australia in 1984 and in 1998 was given the manuscript name *'linearifolia*'. In the meantime, a second population of the new duck-orchid was found in South Australia in 1986, on Kangaroo Island. In 1992 it was discovered in Victoria, in the northern Grampians. The South Australian and Victorian specimens were examined, determined to be different to *C. nigrita* and, in 2003, were described as the new species *C. disjuncta* (as *Paracaleana disjuncta*), the specific name referring to the widely separated localities where it occurred in Victoria and South Australia. When *'linearifolia'* was compared to *C. disjuncta* it was determined that they were the same species. As the name *linearifolia* had never been formally published, the name *disjuncta* had to be applied to the Western Australian plants, so now the species occurs right across southern Australia, making it the most widely distributed of the small Caleana species (and the specific name *disjuncta* even more appropriate) (Backhouse et al. 2016).

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* as *Caleana* sp. aff. *nigrita* (SAC 1998).

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

Proposed conservation status

Critically Endangered in Victoria

Criterion C2a(i); D

Species Information

Description and Life History

Flowering stem erect, 8-15 cm tall, slender, without sheathing bract. Leaf ovate, 1.5-2 cm long, 4-10 mm wide, green above, purplish below. Flower usually solitary, yellowish-green to reddish-brown; ovary straight or humped; dorsal sepal closely following curve of column, channelled, narrowly obovate to spathulate, 7-10 mm long; lateral sepals down-curved in direction of upper margins of column wings, distal end bent or curved away from column, channelled, linear-lanceolate, c. 7 mm long; petals lying against the column wings, thread-like, obtuse, c. 7 mm long. Labellum claw strap-like, curved, to 5 mm long, attached towards base of inflated part of lamina; lamina ovate, to 10 mm long, centre inflated and hollow, cavity open below, apex prolonged into beak-like extension, base with a triangular point, upper surface densely warty only in apical third, under-surface smooth. Column broadly winged from anther to distal end of c. 3 mm long foot, cupped. The taxon flowers from November to December (VicFlora 2015).

There is very little known about its life history. It is a terrestrial deciduous herb, with a winter-spring growing and flowering season and a summer dormant season. Reproduction is probably entirely by seed, with only one replacement tuber produced each season, and the pollinator is not known (SAC 1998).

Generation Length

The generation length of *Caleana disjuncta* is estimated to be 30 to 60 (likely 50) years. Generation time for colony-forming clonal terrestrial orchids is estimated to be a nominal 50 years (or more) based on the capacity of each clone or genet to persist for decades without reliance on seed germination for population maintenance. Whilst mortality of clones may occur for a variety of endogenous (genetically determined) or exogenous (environmental) reasons, the clonal replacement is likely to occur at multi-decadal intervals.

Distribution

All 3 known localities occur in the Grampians National Park, in western Victoria. The taxon is small and difficult to detect in the dense heathy woodland in which it grows. Other subpopulations may exist in the Grampians.

The taxon was only discovered in Victoria in 1992. In 1998, it was known from a single population of about 30 plants in heathy-woodland. The population was situated on private land in the northern Grampians. The only recorded site is on private land near Roses Gap adjacent to the Grampians National Park (SAC 1998). In 2002, the total population size was also estimated at 30 mature individuals and this figure was more or less stable over the previous 4-6 years of observation. There were approximately 10-15 flowering plants observed each season. Since 2006, several other populations have been found in the Grampians south to near Mirranatwa, over a distance of about 55 km. Given its wide national distribution, the taxon possibly occurs elsewhere in western Victoria, but the tiny leaves and very small flowers are difficult to detect within the often-dense heathy woodland in which it grows (Backhouse et al. 2016).

Habitat

The taxon grows in Brown Stringybark *Eucalyptus baxteri* heathy woodland on well-drained grey sandy loam soils (Backhouse et al. 2016; VicFlora 2015; SAC 1998). The altitude range is 180-300 metres above sea level (Backhouse et al. 2016).

Threats

Subpopulations and habitat may be at risk from disturbance and increasingly dry conditions from declining rainfall and consequent increase in 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.

The taxon is extremely vulnerable to habitat disturbance and destruction, habitat change through weed invasion and changed fire regimes, and loss through predation, illegal collection, trampling and unpredictable catastrophic events (SAC 1997).

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

The past population reduction does not meet the threshold for eligibility under criterion A2, and the future population reduction does not meet the threshold for eligibility under criterion A3.

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

The taxon is estimated to be severely fragmented because of its limited dispersal ability and isolation of subpopulations from one another, 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 (iii) and (v) above, based on increasingly dry conditions from reducing rainfall and consequent increase in intensity and severity of bushfires, leading to decline and loss of subpopulations.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 12 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.

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 Critically Endangered

The taxon is estimated to have 40 to 100 mature individuals.

The number of mature individuals is projected to continue to decline, and the number of mature individuals in each subpopulation is 50 or fewer.

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 Critically Endangered

The taxon is estimated to have 40 to 100 mature individuals.

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

References

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VicFlora (2015). Flora of Victoria, Royal Botanic Gardens Victoria: *Caleana disjuncta*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/dd11df92-d21c-45b5-a7d9-b24fb4b70dea