Threatened Species Assessment

Corunastylis densa
Dense Midge-orchid

Taxonomy

Corunastylis densa (Fitzg.) D.L. Jones & M.A. Clem.

The taxonomy of this orchid has been rather confused, with it being considered first as *C. nudiscapa*, then identified as an un-named species, and most recently being including in *C. densa*, a species that was otherwise known from New South Wales (Backhouse et al. 2016).

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

Criterion D

Species Information

Description and Life History

The taxon is a flowering plants 3-6 cm tall. Leaf lamina 6-12 mm long, projecting through the basal flowers of the inflorescence and outwards from the peduncle. Inflorescence 8-15 mm long, densely crowded. Flowers 5-25, reddish brown to dark purplish, 3-4 mm across, nodding; perianth segments sharply pointed; dorsal sepal ovate, 3-3.5 mm long, c. 1.5 mm wide, margins entire; lateral sepals divergent, linear-lanceolate, 3.5-4.5 mm long, c. 1 mm wide, apex with a small white beady gland; petals ovate, c. 2.5 mm long and 1 mm wide, apex with a small white beady gland. Labellum elliptic to obovate, 2-2.2 mm long, 1-1.2 mm wide, margins irregular or minutely denticulate; callus oblong, occupying most of the ventral surface and extending to the labellum apex. Column wings smooth or slightly scabrid. The taxon flowers from December to February (VicFlora 2018).

The taxon is best recognised by its distribution, summer flowering period and broad labellum that lacks any marginal hairs (Backhouse et al. 2016). All subpopulations have very low numbers of flowering plants each year, with some subpopulations not flowering in some years.

Corunastylis nuda, in the strict sense, is restricted to mid- to south-eastern New South Wales. The taxonomic status of Victorian plants currently referred to this name is under review (Jones 2017).

Generation Length

The generation length of *Corunastylis densa* 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 confined to a small area in the mountains of eastern Victoria between Tamboritha and Dargo. The altitude range is from 1000-1300 metres above sea level. The taxon seems to have a remarkably limited

distribution in Victoria. It is most likely overlooked due to its tiny size and remote, poorly accessible habit, and the taxon possibly occurs elsewhere in the eastern highlands (Backhouse et al. 2016).

Habitat

The taxon grows in Snow Gum *Eucalyptus pauciflora* woodland, sometimes growing up through prostrate shrubs including *Baeckea* and *Hibbertia* species (Backhouse et al. 2016). It occurs on shallow soil over rocks (VicFlora 2018).

Threats

The habitat is protected in the Alpine National Park. However, there is a risk of habitat decline through the impacts of disturbance and increasingly dry conditions from reducing rainfall and consequent increase in intensity and severity of bushfires, possibly leading to decline and loss of subpopulations. 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:

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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 374 km² and the Area of Occupancy (AoO) is estimated to be 12 km², but other thresholds under this criterion have not been met.

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:

Ineligible under Criterion C

It is estimated that there are 15 to 40 mature individuals, but other thresholds under this criterion have not been met.

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 15 to 40 mature individuals in 3 very small subpopulations.

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.

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

Jones, D.L. (2017). Characterisation of *Corunastylis nudiscapa, Corunastylis densa* (Orchidaceae: Prasophyllinaee) and the description of a *Corunastylis leptochila*, a related, new species. *Australian Orchid Review, 82*(5), 48-56.

VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Corunastylis densa*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/2bf3cfa3-ee1e-47c5-a586-d0fd36951f87