Threatened Species Assessment

Corybas sp. aff. *diemenicus* (Coastal)
Late Helmet-orchid

Taxonomy

Corybas sp. aff. *diemenicus* (Coastal) sensu Ross (2000)

This is the last species of Corybas to flower in Victoria. It can be distinguished from *C. diemenicus* by the labellum auricles which are obscured by the lamina, the later flowering period and unique habitat (VicFlora, 2015).

Synonym: *Corybas* 'late flowering' (Backhouse et al., 2016). It is distinctive but undescribed species that is related to *C. diemenicus*, from which it can be distinguished by its spring flowering time, swampy habitat and darker flowers with a white and maroon boss that has a covering of short, stiff hairs in the lower half. It is most similar to *C. grumulus* but that species occurs in the mountains, flowers slightly earlier and does not grow in swamps (Backhouse et al., 2016).

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 Australia.

Criteria A2ce+4ce

Species Information

Description and Life History

The taxon has leaves circular to cordate, sometimes 3-lobed, green above, frosty underneath, 15-25 mm long, 15-25 mm wide. Flower reddish-purple, pedicel (excluding ovary) c. 2 mm long; dorsal sepal dark reddish, broadly oblong-obovate, narrowly contracted at base, hooded, covering labellum and extending beyond it, c. 2 cm long when flattened out; lateral sepals linear, tapered, fused at expanded base, directed more or less horizontally forward, c. 3 mm long; petals linear, usually directed forwards, c. 2 mm long. Labellum 15-20 mm long when flattened out, tube erect, about as long as lamina, auricles wide and opening downwards obscured by labellum lamina; lamina acutely recurved, expanded into trumpet-shaped orifice, crimson-streaked along veins with reddish bristles in front of boss, margins coarsely toothed and directed forwards or spreading; central boss reddish, inconspicuous, convex (not channelled); callus entire. Column not winged (VicFlora, 2015).

The taxon is a tiny summer-dormant, terrestrial, deciduous herb that emerges annually from a spherical subterranean tuber. There is a single ground-hugging heart-shaped leaf to 12 mm wide, and a single translucent dark reddish flower to 10 mm wide borne on a short stem and held just above the leaf. The labellum is rounded, with a dark red central mound and flared, coarsely toothed margins. The dorsal sepal caps the labellum, while the petals and lateral sepals are reduced to short, fine appendages and held against the ovary. The leaves appear in winter, with plants flowering in September and October, setting seed and going dormant in late spring (Duncan et al., 2009).

Generation Length

The generation length of the taxon is estimated to be 30 to 60 (midpoint 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

The taxon occurs in Victoria and the extreme southeast corner of South Australia, between Wilsons Promontory in the South Gippsland area, in the east, and near Nelson in the far south-west. The altitude ranges from 10-15 metres above sea level. Also occurs in SA (Backhouse et al., 2016; Duncan et al., 2009).

Habitat

The taxon occurs in closed scrub dominated by Woolly Tea Tree (*Leptospermum lanigerum*) in swamps and along watercourses on waterlogged, black, peaty alkaline soils (Backhouse et al., 2016). The understorey is relatively open, with a herbaceous ground layer that may include *Gahnia* species, *Viola hederacea, Lobelia* species, *Selliera radicans, Urtica insisa, Carex appressa*, *Schoenus nitens, Geranium molle* and various mosses and small ferns (Coates et al., 2002). Within the *L. lanigerum* stands, plants generally occur on small mounds a few centimetres above the normal inundation level. Populations occur in small isolated patches on only a few square metres (Duncan et al., 2009).

Threats

The historical range and distribution of the taxon is not known, but it is likely to have been more common prior to landscape-scale disturbance, particularly from weed invasion and draining and clearing of Woolly Tea Tree scrub for agriculture. While the taxon remains widely distributed, all populations are small, fragmented and isolated from one another. At least one (Mornington Peninsula National Park) is probably extinct. While the largest population is reserved in the Wilsons Promontory NP, most populations and plants occur on private property, and will require sympathetic management to survive (Duncan et al., 2009).

Remaining populations face a range of current and potential threats, including weed invasion by a wide variety of weed species. This is a significant problem at all sites, especially the flatweed *Hypochoeris radicata* and *Solanum* sp. at the Wilsons Promontory NP site and Climbing Groundsel *Senecio angulatus* at the Mornington Peninsula NP site (where plants have not been seen for over a decade). Grazing by stock and/or native and introduced herbivores is as serious threat at all sites. Site disturbance by sheep/cattle is a serious threat at all unfenced private property sites, as they are capable of forcing their way through the dense understorey, breaking up the vegetation, damaging soil structure and trampling plants. Trampling by Hog Deer is a threat at the Wilsons Promontory NP site. Accidental trampling and site disturbance through management activities is a problem in Wilsons Promontory NP, as some plants occur close to the access track. All sites are threatened by drought/climate change, specifically, they are at risk of drying out due to prolonged drought in south-eastern Australia, and there has already been dieback of Woolly Tea Tree at some sites. There is a high risk of local extinctions due to small population sizes at some sites (Duncan et al., 2009).

Much of the remaining *Leptospermum lanigerum* swamp habitat exists as small narrow fragments of scrub on the edge of roadsides, streamside or agricultural properties. These sites in particular face ongoing stress from human agricultural and recreation activities. The larger populations occur in reserves, situated on low coastal plains, some of these sites could be affected by increase in salinity in the event of sea level rises plus by drops in groundwater levels due to agricultural water extraction or oil and gas extraction (Varma and Michael, 2011). Hydrology and drainage changes have been a reported cause of decline in *Pterostylis tenuissima* populations growing in *Leptospermum lanigerum* swamps in South Australia (Dickson et. al., 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%

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 Critically Endangered

The population reduction over the past 90 to 180 years is estimated to be 60 to 85 %, based on (c) and (e) above.

Past decline is based on the taxon's ecosystem decline from 53,649 hectares to around 2,415 hectares since European settlement (Dickson et. al., 2012).

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

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 90 to 180 year period, including both past and future (up to 100 years in the future), is estimated to be 60 to 80 %, based on (c) and (e) above.

Widespread clearing in the past was responsible for dramatic past declines. Current declines are more gradual and more due to habitat degradation.

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

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 Area of Occupancy (AoO) is estimated to be 22 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The same threats appear to impact each subpopulation, however they may operate at different intensities and timescales. Therefore, there are considered to be 3 locations.

It has a continuing decline in (i), (ii), (iii), (iv) 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 C as Vulnerable

It is estimated that there are 1,000 to 2,000 mature individuals, primarily from data published in Duncan et al. (2009).

There is estimated to be a continuing decline of 20 % within three generations.

The number of mature individuals in each subpopulation is 1,000 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 Vulnerable

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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