Threatened Species Assessment

Dendrobium speciosum var. *speciosum*
Rock Orchid

Taxonomy

Dendrobium speciosum var. *speciosum*

This taxon was, until recently, recently referred to as *Thelychiton speciosus*, but the segregate genus *Thelychiton* is not currently recognised (VicFlora 2015) and the scientific name has since reverted to *Dendrobium speciosum.*

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* as *Dendrobium speciosum* (SAC 1991).

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

Proposed conservation status

Critically Endangered in Victoria

Criterion A2acd+4acde

Species Information

Description and Life History

Pseudobulbs to 60 cm long, leaves to 25 cm long, racemes to 60 cm long, sepals and petals to 35 mm long. Creamy white to pale yellow, the labellum with a yellw callus and fine red spots on the lamina. An unmistakeable robust, evergreen, lithophytic orchid from far East Gippsland with thick, fibrous, fleshy pseudobulbs often forming large clumps with a dense root mass, and up to 5 tough, leathery leaves per pseudobulb, each pseudobulb with 1-3 racemes bearing up to 100 scented somewhat incurred flowers with reflexed tips to the sepals and petals. The taxon flowers in September and October. Some plants will regrow after low to moderate intensity fires but very hot fires appear to kill the plants outright (VicFlora 2015).

Generation Length

The generation length of *Dendrobium speciosum* var. *speciosum* is estimated to be 30 to 60 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 is currently confined to a small area around Genoa in far East Gippsland, where it reaches the southern limit of its national distribution and is known from very few small, isolated populations. There is an old (1937) Australian Virtual Herbarium (AVH) record of the taxon from near Cann River, far east of the current subpopulations. The taxon is currently not known from the location, and if the collection details are correct, then this record represents the probable loss of a subpopulation. Additional subpopulations possibly exist on isolated granite outcrops in the region. The altitude ranges from 50-250 metres above sea level (Backhouse et al. 2016).

Previous distribution and abundance are not well known. A subpopulation that occurred near Cann River has not been seen for some decades and may have become locally extinct. Most plants occur in the Howe Range

subpopulation. Smaller numbers of plants occur on scattered granite outcrops in the Genoa River, Genoa Peak and Stony Peak areas. Other groups of plants possibly exist on isolated granite outcrops in the region.

Habitat

The taxon grows on granite and sandstone rocks along river valleys and on isolated rocky peaks.

The taxon occurs on exposed rock faces, predominantly granite but occasionally sandstone and favours the sheltered southerly aspects. The taxon grows amongst outcropping boulders or cliff-faces, either along streambanks or in gorges and escarpments. It occurs in open-forest communities dominated by a canopy of Myrtaceous trees, e.g. *Eucalyptus sieberi*, *E. gummifera* and *Angophora floribunda*. Species commonly associated with the orchid include *Dendrobium striolatum, Pyrosia rupestris, Asplenium flabellifolium* and various bryophytes.

Threats

There is some observational evidence of decline in remaining subpopulations through plants being killed by bushfires, and observational and anecdotal evidence of illegal collection for the nursery trade, which is probably the main threat to the taxon. Substantial populations once occurred in close proximity to roads and tracks around the Mallacoota and Genoa districts, but most of these accessible plants have disappeared due to collectors (SAC 1991). Most remaining sites are relatively inaccessible and not currently deemed at risk from collection or habitat changes in the near term. The largest plants are usually growing on very steep, near vertical rock faces where they seem to be out of reach of browsing herbivores such wallabies and possibly possums. Plants growing on more accessible sites often show signs of the new leaves and even pseudobulbs being eaten, and plants are rarely seen on horizontal surfaces.

Very small subpopulations are highly susceptible to stochastic events causing major decline or local extinction within a very short time frame.

The taxon is killed outright or severely damaged by fire. Both bushfires and imposed burns present a major threat to the survival of this taxon, as it often occurs in exposed localities supporting planned flammable vegetation.

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 150 years is inferred to be 60 to 90%, based on (a), (c) and (d) above.

The bushfires of 20-19/20 are believed to have burned 94% of the taxon's modelled habitat, with 63% impacted by high intensity fire. The taxon is susceptible to fire, and although the degree of impact has not been determined, it is likely to have suffered considerable damage.

Eligible under Criterion A3 as Endangered

The population reduction over the next 100 years is projected to be 20 to 50%, based on (c) and (d) above.

This is based on the ongoing impacts of the identified threats, notably the risk of repeat fires.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 300 to 600 year period, including both past and future (up to 100 years in the future), is estimated to be 80 to 95%, based on (a), (b), (c) and (e) above.

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

The taxon is estimated to have a single location, as all plants occur in a small area and are at risk of repeat fires, which could impact all individuals.

It has a continuing decline in (ii), (iii) and (v) above, based on the current and projected impact of the identified threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 40 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above it is estimated to have 1 location and has a continuing decline in (ii), (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 Endangered

It is estimated that there are 220 to 340 mature individuals. It has an inferred continuing decline, and 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

The taxon is estimated to have 220 to 340 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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SAC (1991). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 37 *Dendrobium speciosum.*

VicFlora (2015). Flora of Victoria: *Dendrobium speciosum* var. *speciosum*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/6679433a-0bef-45ae-961b-ecb4dce22964