Threatened Species Assessment

Dendrobium striolatum
Streaked Rock-orchid

Taxonomy

Dendrobium striolatum Rchb. f.

This orchid was, until recently, well-known as *Dockrillia striolata*, after *Dockrillia* was erected as a split from Dendrobium. However, the scientific name has since reverted to *Dendrobium striolatum*. There are two described subspecies, with nominate subspecies *striolata* occurring in Victoria, New South Wales and Tasmania (Cape Barren Island and Flinders Island), while subspecies *chrysantha* D.L .Jones occurs in the north-east of Tasmania (Backhouse et al., 2016).

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria A2acde+4acde; B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is rock-dwelling, sometimes forming extensive mats. Stems long, pendulous, wiry, new branches arising below leaves, aerial roots often produced from lower nodes. Leaves 1 per node, 1-12 per flowering stem, 2-9 cm long, 1-2 mm wide (rarely more), cylindric, elongate, usually curved, subtended by a sheathing bract (soon deteriorating, often leaving stringy remains). Inflorescence terminal, 1- or 2-flowered; pedicels (including ovary) 1-2 cm long, thread-like, subtending bract tiny and deciduous; flowers with labellum at top, sepals and petals whitish, cream or yellow with a few red to brown streaks at base, labellum white, devoid of markings, chin-like extension of fused sepal-bases well-developed, c. 5 mm long, cylindric, shallowly cleft. Dorsal sepal recurved, narrowly ovate, 10-15 mm long; free part of lateral sepals divergent, tapered to blunt or pointed apex, c. 10-15 mm long. Petals divergent, narrow-obovate or lanceolate, c. 10-15 mm long, narrower than sepals. Labellum curved, c. 15 mm long when straightened; lateral lobes erect, short, blunt; mid-lobe ovate, with upcurved, deeply wavy margins; lamina callus consisting of 3 parallel ridges, becoming wavy as they extend onto mid-lobe. The taxon flowers from September to November (VicFlora, 2015).

The taxon is a mat-forming, evergreen lithophytes, with creeping rhizomes. Sometimes the mats can be so large that they virtually peel away from the rock surface under the weight of the plants. The leaves turn purplish when exposed to direct sunlight but remain green in more shaded situations. Pollination of the species is by insects through simple food deception, the insects often attracted by a sweet fragrance (Backhouse et al., 2016).

Generation Length

The generation length of *Dendrobium striolatum* 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 East Gippsland, having a western limit at the Mitchell River gorge, north of Bairnsdale. The altitude ranges from 40-1000 metres above sea level, at nearly 1000 metres at Reedy Gorge and Stradbroke Chasms in Alpine National Park It also occurs in Tasmania and NSW (Backhouse et al., 2016).

Habitat

The taxon grows on rocks, often in exposed positions on boulders and cliffs along river gorges and isolated rocky peaks (Backhouse et al., 2016). It is sometimes locally plentiful, chiefly on granite rock faces and crevices in both sheltered and quite exposed sites (VicFlora, 2015).

Threats

The taxon has a restricted distribution in Victoria, although it is often locally common in suitable habitat, with rocky cliffs and peaks sometimes carpeted with extensive mats of this orchid. Sometimes the mats can be so large that they virtually peel away from the rock surface under the weight of the plants. The illegal collecting of plants has been a problem at some of the more accessible sites, where some rock faces have been stripped of plants (Backhouse et al., 2016). The taxon is mainly threatened by illegal collecting at more accessible sites like Genoa Peak walk and Genoa Falls. As the plants are totally exposed on the rock surface, they cannot survive hot summer bushfires. Increases in intensity or frequency of hot summer fires as a result of climate change has the potential to threaten the species across its range. This was observed in the bushfires of 2020. The taxon is also threatened by disturbance from rabbits and goats.

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 estimated to be 50 to 80% (midpoint 65%), based on (a), (c), (d) and (e) above.

Past decline is based on losses due to illegal collecting, mainly in accessible sites, and possibly more widespread losses from bushfires. Specifically, the 250,000 hectares Cann River fire of 1983 burnt through a large swathe of habitat. The bushfires of 2019/2020 are believed to have potentially impacted more than 80% of the taxon's habitat. As a lithophyte, the taxon is sensitive to fire, but it may have been sheltered in gullies and gorges. It is likely to have been significantly impacted but the degree is yet to be determined.

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

Eligible under Criterion A3 as vulnerable

The population reduction over the next 60 to 100 years is estimated to be 30 to 60% (midpoint 45%), based on (c), (d) and (e) above.

The taxon has been threatened by illegal collecting, which still occurs, but it is not as prevalent as in the past. Bushfires are the major ongoing threat to the taxon.

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 60 to 80% (midpoint 70%), based on ((a), (c), (d) and (e) above.

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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 223 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is considered to occur in one location as the key identified threat of bushfire applies across its range and can rapidly affect all individuals of the taxon present.

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:

Ineligible under Criterion C

It is inferred that there are 50 to 250 (midpoint 100) 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 D2 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

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. Retrieved from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf

Jones, D.L. in Banks, D.P. (ed.) (1998), Introduction and the genera *Acianthus, Arthrochilus*, X *Calassodia, Calochilus, Corybas, Cyrtostylis, Dipodium, Dockrillia, Gastrodia, Leptoceras, Microtis, Pyrorchis* and *Townsonia. Australian Orchid Research* 3: 8.

VicFlora (2015) Flora of Victoria, Royal Botanic Gardens Victoria*: Dendrobium striolatum*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/a6d662aa-1095-42e6-af3f-c76726e60370