Threatened Species Assessment

Diuris ochroma
Pale Golden Moths

Taxonomy

Diuris ochroma D.L. Jones

Current conservation status

Listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*.

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

Endangered in Victoria

Criteria A2ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a flowering plant slender, 25-37 cm tall. Leaves 3-5, linear, channelled, 13-18 cm long, in loose, erect tussock. Flowers 2 or 3, drooping, pale yellow-cream with maroon striations on outer surface of petals and labellum and on both surfaces of dorsal sepal; pedicel (excluding ovary) c. 3 cm long, slender, partly enclosed within bract; dorsal sepal erect, ovate, c. 12 mm long, much shorter than other perianth parts; lateral sepals obliquely deflexed, parallel, linear-lanceolate, c. 15 mm long, green; petals spreading or drooping, c. 15 mm long, claw maroon, lamina elliptic. Labellum c. 15 mm long; lateral lobes small, asymmetric, triangular, outer margin irregularly toothed from base to tip; mid-lobe more than 3 times as long as lateral lobes, broadly ovate to wedge-shaped, narrowed at base; callus ridges complexly lobed, with faint accessory ridges radiating onto the mid-lobe. Column wings higher than anther (VicFlora, 2018).

Leaves appear in early spring and plants flower in November and December setting seed and going dormant in summer. It flowers well in years of good winter and spring rains but sporadically in drier years (Backhouse et al., 2016).

from the mountains of eastern Victoria with 1 to 3 pale, sometimes colourful, nodding compressed flowers with proportionately small, narrowly ovate to elliptic petals narrowly spreading to incurved and held close to the labellum, and the dorsal sepal with a slightly upturned tip (Backhouse et al. 2016).

Generation Length

The generation length of *Diuris ochroma* 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 known from two sites in valleys in the mountains of eastern Victoria: Abbeyard in the upper Buffalo River valley and in the Wonnangatta River valley at Billabong, east of Mt Howitt. The altitude ranges from 390 to 550 metres ASL. The taxon also occurs in NSW (Backhouse et al., 2016; VicFlora, 2018). Most of the populations at the Abbeyard location are quite small and occur in small areas of non-degraded grassland surrounded by non-native pastures. A more extensive population of a few hundred plants was located recently in the Abbeyard region by the Australasian Native Orchid Society (ANOS).

Habitat

The taxon grows at 400 to 500 metre altitude in moist sub-alpine grassland/herbfields and sparse Eucalyptus woodland with a herbaceous understorey. Common associated species include Kangaroo Grass (*Themeda triandra*), Annual Meadow Grass (*Poa annua*), Austral Bugle (*Ajuga australis*), woodruffs, *Asperula* sp., Bidgee-Widgee (*Acaena novae-zelandiae*), buttercups (*Ranunculus* sp.), early nancys (*Wurmbea* sp.), Suckling Clover (*Trifolium dubium*), sedges (*Lomandra* sp.) and Soft Brome (*Bromus hordeaceus* subsp.*hordeaceus*) (Duncan and Coates, 2010; VicFlora, 2018).

Threats

The taxon is subject to weed invasion and competition. Namely, St. Johns Wort (*Hypericum perforatum*) and Blackberries (*Rubus fruticosus*) are a serious problem at the Alpine NP site. Grazing by rabbits is a serious threat at the Alpine NP and Abbeyard sites, while grazing by cattle is a serious threat at the Abbeyard. There is potential for accidental damage caused by road/track maintenance activities and fire suppression activities plus the potential for accidental destruction by off road vehicles at both the Alpine NP and Abbeyard sites. Trampling and soil compaction by grazing cattle is a threat at Abbeyard. The taxon is also subject to ecosystem conversion/degradation due to continued cattle grazing at Abbeyard (Duncan and Coates, 2010).

Measures have been undertaken to halt the decline of *Themeda triandra* grassland at the Alpine NP site, however, some ongoing decline is projected. The implementation of correct fire regimes should help maintain the existing *Themeda* grassland habitat. It is unknown if it can restore or improve degraded *Themeda* grassland at this site. The Abbeyard population is likely to be severely reduced due to the effects of ongoing grazing.

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 60%, based on (c) and (e) above.

Much of the Abbeyard region has been heavily grazed and *Themeda* grassland converted to pasture. It is likely that the taxon was once more widespread in this area in the past. The Alpine NP site was also previously grazed. The bushfires of 2019/2020 are believed to have potentially impacted between 20 to 50% of the taxon's habitat, although the overall impacts of the fire are yet to be determined. The taxon's recovery depends on the effective control of the impacts of feral herbivores.

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 20 to 30%, based on (c) and (e) above.

Much of the Abbeyard region has been heavily grazed and *Themeda* grassland converted to pasture. It is likely that the taxon was once more widespread in this area in the past. The Alpine NP site was also previously grazed. The bushfires of 2019/2020 are believed to have potentially impacted between 20 to 50% of the taxon's habitat, although the overall impacts of the fire are yet to be determined. The taxon's recovery depends on the effective control of the impacts of feral herbivores.

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 40 to 55%, based on (a), (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 62 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

Two locations have been determined on the basis of differential threats affecting the two occurrences. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 28 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it has two locations and 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 7,000 to 11,000 mature individuals. This is based on data published in Duncan and Coates (2010) and on more current observations. The numbers of flowering plants can vary a lot from season to season due to dormancy, though the total number of both dormant and flowering plants is fairly stable.

There is estimated to be a continuing decline of 20 to 30 % within three generations.

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

It is estimated that there are 7,000 to 11,000 individuals, and the taxon is observed 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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Duncan, M., and Coates, F. (2010). National Recovery Plan for Twenty-two Threatened Orchids in South-eastern Australia. Melbourne: Department of Sustainability and Environment.

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