



Diuris protena Northern Golden Moths

Taxonomy

Diuris protena D.L. Jones

This taxon is similar to *Diuris fucosa*, but that species has generally larger flowers with a broader labellum that has darker central stains and striations (VicFlora 2015).

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2007).

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

Proposed conservation status

Critically Endangered in Australia

Criteria A2ace+4ace

Species Information

Description and Life History

The taxon is a flowering plant, slender, 12-20 cm tall. Leaves mostly 4-8, linear, 7-12 cm long, in a loose, erect tussock. Flowers 1-3, semi-erect to porrect, mostly pale yellow with dark stains and striations on labellum; pedicel (excluding ovary) 2.5-6 cm long, slender, partly enclosed within bract; dorsal sepal porrect or obliquely erect, ovate, 9-15 mm long, shorter than other perianth parts, yellow with some dark striations at base; lateral sepals obliquely deflexed, usually parallel, linear-oblong, 13-20 mm long, green; petals incurved to slightly spreading, 10-20 mm long, claw green to brown, lamina ovate, elliptic or ovate-lanceolate, yellow. Labellum porrect or obliquely erect, 10-18 mm long, 3-lobed; lateral lobes small, oblong-cuneate, outer margins irregularly erose; mid-lobe almost flat, c. 4 times as long as the lateral lobes, narrowly ovate, yellow with light tan-brown stains and striations, narrowed at base, with 2 widely separated, pubescent, longitudinal ridges extending shortly beyond base, a single, less distinct ridge continuing almost to apex. Column wings slightly exceeding the anther. The taxon flowers from August to September (VicFlora 2015).

Generation Length

The generation length of *Diuris protena* 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 endemic to Victoria, where it occurs in the north-central parts of the state (VicFlora 2015). Specifically, the taxon is known from just four sites between Donald, Terrick Terrick and Elmore, in northern and north western Victoria. The taxon population is probably several hundred plants (SAC 2007). It is known from just 6 subpopulations occurring at 2 locations, with fewer than 1300 plants.

Habitat

The taxon is known from grassland and grassy woodland (VicFlora 2015). Specifically, the taxon grows in herb-rich northern plains (Riverina) grasslands, on heavy clay-loam soils with a cracking silty crust (termed 'parna'). At one site, near Donald, the taxon grows on the top of a granite hill in open grassland sheoak *Allocasuarina* species woodland (SAC 2006).

Threats

The remaining subpopulations mostly occur in very small, isolated habitat patches and are highly fragmented. Several subpopulations are declining, and all are subject to a range of threats including disturbance, weed invasion and increasingly dry conditions from reducing rainfall, probably leading to further 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. Furthermore, almost all habitat has been cleared for agriculture with remaining habitats subject to moderate to severe weed invasion; the small population near Elmore is almost totally overrun by weeds (SAC 2007).

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%

<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>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.</p> <p>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]</p> <p>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.</p>	<p>based on any of the following:</p>	<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>
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Evidence:

Eligible under Criterion A2 as Critically Endangered

The population reduction over the past 60 to 120 years is inferred to be 80 to 95 %, based on (a), (c) and (e) above.

Past decline is based on extensive historic loss of habitat.

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

Eligible under Criterion A3 as Critically Endangered

The population reduction over the next 60 to 100 years is projected to be 30 to 85 % (midpoint 60%), based on (c) and (e) above.

Future decline is based on ongoing decline in subpopulations and habitat conditions.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 60 to 120 year period, including both past and future (up to 100 years in the future), is inferred to be 50 to 90 %, based on (a), (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

Past decline is based on extensive historic loss of habitat.

Future decline is based on ongoing decline in subpopulations and habitat conditions.

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 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 Extent of Occurrence (EoO) is estimated to be 3,040 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The Area of Occupancy (AoO) is estimated to be 20 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

Considering the limited dispersal ability of the taxon, the barriers to dispersal, or lack of habitat separating them, the individuals can be considered to be severely fragmented.

Two locations have been determined, based on geographic separation: the Mallee, with 1 subpopulation (Lillimur South); and Northern Plains, with the remaining 5 subpopulations. The identified threats are likely to impact all individuals in each subpopulation, although the one at Terrick Terrick is less prone to the threats that operate on private land.

There is a continuing decline in (i), (ii), (iii), (iv) and (v) above.

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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 Endangered

It is estimated that there are 600 to 1,300 mature individuals. The number of mature individuals is based on sporadic survey and Victorian Biodiversity Atlas (VBA) records.

There is inferred to be a continuing decline of 10 to 45 % within one generation.

Criterion D. Very small or restricted populations		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 km ² or number of locations ≤ 5

Evidence:

Eligible under criterion D as Vulnerable

It is estimated that there are 600 to 1,300 individuals, and 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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