Threatened Species Assessment

Ptilotus nobilis var. *nobilis*
Yellow Tails

Taxonomy

Ptilotus nobilis var. *nobilis* (Lindl.) F. Muell.

A study by Lee *et al*. (2007) united *P. nobilis* and *P. exaltatus* on molecular grounds, but a morphological and ecological investigation by Hammer *et al*. (2017) separated the two species. In Victoria at least, the two species are readily distinguishable and are maintained here (VicFlora 2018).

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criterion A2ce

Species Information

Description and Life History

The taxon is a deeply taprooted herb with several stout, erect, simple branches to c. 40 cm high. Stems glabrous. Basal leaves obovate to oblanceolate, 5-14 cm long, 1-3.5 cm wide, glabrous, thick; stem leaves similar but smaller. Spike erect, cylindric, 5-12 cm long, 4-5 cm diam., dense, yellow-green; bract ovate, c. 1 cm long, acute or acuminate with mucro 0.5-1 mm long; bracteoles similar to bract; perianth 20-25 mm long; tepals united at base into a hardened cup c. 2 mm long, otherwise free, outer surface with long, silky hairs in the distal half, overlying a denser layer of short barbed hairs that extend to the base (where slightly longer), inner surface glabrous except for a loose woolly tuft at base; fertile stamens 3 or 4; ovary supported on stipe as long as basal cup of perianth, sparsely pubescent at summit, style virtually central, slightly sigmoidal, 16-20 mm long. The taxon flowers from August to December (VicFlora 2018).

Generation Length

The generation length of *Ptilotus nobilis var. nobilis* is estimated to be 5 to 25 years. The taxon is likely to be a short-lived perennial which can resprout if sustained by summer rainfall but will die in drought. The longevity is plausibly 2-4 years or more. The taxon recruits in response to summer rain, which occurred less frequently than annually at the time of European settlement, and the interval between successive recruitment pulses, depending on the frequency of favourable seasons. The taxon also recruits in response to flood events at pre-settlement intervals determined by the frequency of La Niña events.

Distribution

The taxon is apparently very rare in Victoria and it is apparently confined to the Murray River floodplain from near Red Cliffs to about Merbein. The taxon occurs in all mainland states (VicFlora 2018).

Habitat

The taxon is apparently confined to *Eucalyptus largiflorens* (Black Box) woodlands on clayey soils on the Murray River floodplain, where it is sometimes locally abundant following good rains or floods (VicFlora 2018).

Threats

The taxon is likely to have suffered significant historic decline through habitat loss and degradation due to agricultural activity and urban development, particularly in the Mildura and Cardross districts. However, agricultural activity in these areas is no longer regarded as a significant cause of local extinction. The greatest current threat to the taxon is likely to be the reduced reliability of flooding in response to water diversion for irrigation and the possibility that environmental water allocations may not replicate the pre-settlement flood regime required for successful recruitment and seedset.

It is unclear whether the taxon is currently at risk since it is resilient to disturbance and the replacement of winter rains by summer rainfall may actually favour seed recruitment. Although the soil-stored seedbank is of unknown persistence, there is no evidence that the taxon is at current risk from seedbank decline or exhaustion. The most plausible long-term risk to this taxon is the changing seasonality and reliability of rainfall events. Another risk is the increasing frequency, duration and intensity of drought events, which may result in recruitment failure, seedbank depletion or exhaustion and local extinction.

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 15 to 75 years is estimated to be 30 to 80 (midpoint 50)%, based on (c) and (e) above.

Historic decline is likely to have been significant although the proportion of this decline which has occurred within the last three generations cannot be estimated with any confidence. However, if generation time is close to the lower bound estimate of 5 years then the proportion of this decline, if any, which falls within the last three

generations is likely to be an artefact of the Millennium Drought and post-drought recovery. In addition, any apparent decline in the last 15 years would be difficult to distinguish from seasonal fluctuations.

The causes of the 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:

Ineligible under Criterion B as Data Deficient

There is insufficient evidence to determine the Extent of Occurrence (EoO) or Area of Occupancy (AoO).

Persistent confusion regarding the circumscription and correct application of the name *Ptilotus nobilis* to Victorian specimens and unvouchered site records renders any attempt to estimate EoO or AoO almost meaningless.

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 as Data Deficient

There is insufficient evidence to determine the number of mature individuals.

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

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Hammer, T.A., Macintyre, P.D., Nge, F.J., Davis, R.W., Mucina, L., & Thiele, K.R. (2018). The noble and the exalted: a multidisciplinary approach to resolving a taxonomic controversy within *Ptilotus* (Amaranthaceae). *Australian Systematic Botany, 31*(3), 273-274.

Lee, K.K., Johnstone, M.E., Harrison, D.K., & Williams, R.R. (2007). Molecular taxonomic clarification of *Ptilotus exaltatus* and *Ptilotus nobilis* (Amaranthaceae). *Australian Systematic Botany, 20*, 72-81.

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