

## *Eucalyptus molyneuxii* Little Desert Peppermint

### Taxonomy

#### *Eucalyptus molyneuxii* Rule

The taxon's affinities lie with *E. willisii* ssp. *falciformis* which is endemic to the Grampians, coastal and sub-coastal sites in far south-western Victoria, and far south-east South Australia. *E. molyneuxii* can be distinguished by the green juvenile leaves, the non-pendulous branchlets and the sessile or subsessile fruits. Other taxa in the *E. willisii* complex are characterised by greyish juvenile leaves, pendulous branchlets and distinctly pedicellate fruits (Rule 1999).

### Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2003).

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

### Proposed conservation status

Critically Endangered in Australia

Criteria B1ab(iii)+2ab(iii); D

### Species Information

#### Description and Life History

*E. molyneuxii* is a mallee or small tree to 5 m tall. Bark is peppermint-like at the base, often loosely attached, grey and thin, becoming smooth and yellowish above. Adult leaves are alternate, petiolate, lanceolate to 11 cm long and 1.5 cm wide, lustrous, green, concolorous, markedly coriaceous, acuminate, uncinata and glandular. Leaf venation is acute (sub-parallel), visible but not conspicuous, the lateral veins angled at 15-25 degrees to the midvein. Inflorescences are axillary, simple, 11-15 flowered, tightly clustered, on thick, angular, 5-8 mm long peduncles. Buds are ovate-clavate, subsessile to shortly pedicellate, 5-7 mm long and 3-4 mm wide, unscarred, with an obtuse-conical operculum and 3-4 locules. Fruits are sessile to subsessile, cupular or obconical, 4-5 mm long and 5-6 mm wide. Flowering has been observed in autumn (Rule 1999).

#### Generation Length

The generation length of *Eucalyptus molyneuxii* is estimated to be 80 to 200 years. This is based on longevity and timing of recruitment events.

#### Distribution

*E. molyneuxii* is restricted to the Lowan Mallee bioregion. It is known from only two small subpopulations, both of which occur in the central section of the Little Desert National Park in the western Wimmera region in western Victoria (Rule 1999). It is therefore a narrow endemic which has evolved in isolation from other peppermint eucalypts which favour cooler and moister conditions (Rule 1999). Specimen citations provided by Rule (1999) suggest the two stands are located approximately 3 km apart along the MacDonald Highway which traverses the central section of the Little Desert Park from east to west. However, the citations do not individualise the longitude given for the two collection sites, and the more easterly location is erroneously stated to be east (rather than west) of the Nhill-Harrow Road.

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### Habitat

The taxon occurs on deep siliceous sands in association with other mallee eucalypts including *E. arenacea*, (Desert Stringybark), *E. incrassata* (Yellow Mallee), *E. leptophylla* (Slender-leaf Mallee), *E. leucoxyton* ssp. *stephaniae* (Desert Yellow-gum), *E. sabulosa* (Wimmera Scentbark) and *E. wimmerensis* (Wimmera Mallee-box). The area experiences a Mediterranean climate with an annual rainfall of approximately 500 mm, most of which falls in winter (Rule 1999).

### Threats

Rule (1999) notes that "Evidence of charred trunks suggest that the species copes with fire but, nonetheless its situation is highly vulnerable." The taxon is threatened by elimination through circumstances such as failure to recruit successfully through a combination of an unfavourable fire regime, and high seedling mortality. It is also threatened by the current and projected impact of imposed fire regime and climatic drying and warming which, acting synergistically, increase the risk of repeat fire events, adult mortality, and recruitment failure.

### 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:

#### Ineligible under Criterion A

There is insufficient evidence to determine whether there has been or will be a reduction in population sufficient to meet any threshold for Criterion A.

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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 <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
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 Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 8 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA). The EoO has been made equal to the AoO to ensure consistency with the definition of AoO as an area within EoO.

The taxon is estimated to be severely fragmented naturally at the landscape scale, since the two known stands are approximately 3 kilometres apart, a separation which greatly exceeds the dispersal range of the taxon.

It is estimated to have 1 location, and has a continuing decline in (iii) above, based on the current and projected impact of imposed fire regimes and climatic drying and warming, which, acting synergistically, increase the risk of repeat fire events and subsequent impacts on both recruitment and overall habitat condition.

#### Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 8 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. The estimate is based on specimen citations provided by Rule (1999) which suggest the two known stands are located approximately 3 km apart along the MacDonald Highway.

As above, the taxon is severely fragmented, has 1 location, and has a continuing decline in (iii) 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:

#### Ineligible under Criterion C

It is estimated that there are 24 mature individuals, but other thresholds under this criterion have not been met.

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 <sup>2</sup> or number of locations ≤ 5

### Evidence:

#### Eligible under Criterion D as Critically Endangered

The taxon is estimated to have 24 mature individuals. Rule (1999) noted "Both of the known populations of *E. molyneuxii*, each of which consist of about a dozen plants, are secure in the Little Desert National Park."

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

### References

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne.

Rule, K. (1999). A new peppermint for Victoria. *Muelleria* 12(2): 163-167.



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SAC (2003). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 680 *Eucalyptus molyneuxii*

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