Threatened Species Assessment

Dendrophthoe vitellina
Long-flower Mistletoe

Taxonomy

Dendrophthoe vitellina (F. Muell.) Tiegh.

Current conservation status

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

Proposed conservation status

Critically Endangered in Victoria

Criterion A4abc; B1ab(i,ii,iii,iv,v)

Species Information

Description and Life History

Spreading to pendulous shrubs, glabrous except young shoots and inflorescences brown-tomentose; epicortical runners usually present. Leaves alternate or subopposite, narrow-lanceolate to elliptic, 4-14 cm long, 6-45 mm wide, base attenuate, apex rounded, isobilateral, leathery, green; venation distinct or obscure, midrib prominent; petiole 3-15 mm long. Inflorescence of 5-20 flowers, axis 5-50 mm long; pedicels 1.5-4 mm long; bracts c. 1.5 mm long, acute or obtuse. Calyx entire or weakly toothed, limb to c. 1 mm long; corolla 25-50 mm long, yellow to red; anthers 3-5 mm long, c. equal to free part of filament. Fruit ovoid, 10-15 mm long, yellow to red. Flowers Nov.-Mar.

Generation Length

The generation length of *Dendrophthoe vitellina* is estimated to be 8 to 20 years. Hartigan (1960) determined that the average life expectancy of Amyema on Eucalyptus is 10 years. An upper limit of 20 years is given as to account for possible variation in life expectancy between genera and to show an upper limit that may be introduced by fire intervals (mistletoe species are killed by fire).

Distribution

The taxon is confined to around Mallacoota Inlet in far east Victoria. It also occurs in Queensland and New South Wales.

Habitat

The taxon is occurs in the canopy of Eucalypt forest.

Threats

The main threat to *Dendrophthoe vitellina* in Victoria is widespread fires around Mallacoota Inlet. Mistletoe species are killed by fire and their occurrence after fire is reliant on recolonisation from nearby areas from seed from plants that were in areas not affected by fires. The long-term persistence of *D. vitellina* in Victoria relies on some plants escaping fire that can produce fruit that birds (predominantly mistletoe birds) can disperse to areas affected by fires. Increased frequency of fire may also be threatening as this may affect survival of host trees as well as the abundance and extent of mistletoe plants. More widespread fires at higher frequency of occurrence are expected with climate change in the future. *D. vitellina* has also been recorded from trees in Mallacoota and so clearing of trees around Mallacoota is a localised threat.

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 A3 as Vulnerable

The population reduction over the last 105 to 150 years is estimated to be 45 to 60% (midpoint 55%), based on (a), (b) and (c) above.

Given the tendency of the taxon to occupy lowland forest habitats on more fertile flats or lower slopes in the general vicinity of Mallacoota Inlet and the Genoa and Wallagaraugh River valleys, habitats which have been selectively cleared for farm and township development, the taxon is inferred to have suffered significant historic decline. The 2019-2020 bushfire burned an estimated 30-60% of the Victorian range, a proportion of which was severely burnt. The taxon is observed to be killed by intense fire. In recent decades in increasing proportion of adult mortality has been observed which is likely to result from either extreme drought stress or self-pruning of outer canopy branches by the host tree in response to drought stress or mistletoe load.

Eligible under Criterion A3 as Vulnerable

The population reduction over the next 100 years is suspected to be 20 to 80% (midpoint 50%) based on (c) above.

Future decline cannot be estimated with any confidence since the key threats, namely fire frequency, intensity and landscape scale and intense drought stress, operate stochastically and with unpredictable intensity and the opportunity for recolonisation between such events is entirely dependent on the interval between each such stochastic event.

Eligible under Criterion A4 as Endangered

The population reduction over any 105 to 150 year period, including both past and future (up to 100 years in the future), is estimated to be 50 to 90% (midpoint 75%), based on (a), (b) and (c) 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 Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 81 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas.

It is estimated to have 1 location since Victorian occurrences are uniformly subject to the same key threats.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the current and projected impact of the identified threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 48 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has 1 location 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:

Ineligible under Criterion C as Data Deficient

It is too difficult to estimate the number of mature individuals in Victoria. Very few records of this species report the number of individuals seen at the site of recording and if they did it would not give a very good indication of the number of individuals in a subpopulation because plants are likely to be well spread out and will be in the canopy where they will not be easily noticed. These issues make it very difficult to accurately count the number of individuals in a subpopulation.

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

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

Hartigan, D. (1960). The Australian mistletoe. *Journal of Forestry* 58: 211-216.

VicFlora (2015). Flora of Victoria, Royal Botanic Gardens Victoria: *Dendrophthoe vitellina*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/d8820bc1-4c09-4063-b385-12e993ed5f41

Ward, M.J. & Paton, D.C. (2007). Predicting mistletoe seed shadow and patterns of seed rain from movements of the mistletoe bird, *Dicaeum hirundinaceum. Austral Ecology* 32: 113-121.