



## *Dodonaea hexandra* Horned Hop-bush

### Taxonomy

*Dodonaea hexandra* F. Muell.

### Current conservation status

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

### Proposed conservation status

Endangered in Victoria

Criteria A2bc+3bce+4bce; B1ab(iii,v)+2ab(iii,v); C1+2a(i)

### Species Information

#### Description and Life History

The taxon is a dioecious, viscid, spreading shrub to 0.6 m high; branches intricate; branchlets angular and furrowed, usually puberulent. Leaves simple, sessile, linear, 4-14(-35) mm long, 0.5-2 mm wide, channelled below, convex above, acute, margins strongly revolute, entire, glabrous, viscid. Flowers axillary or terminal, solitary, rarely paired; pedicels 1-2 mm long; sepals 3, ovate, 1.5-3.6 mm long, persistent; stamens 6, c. equal in length with sepals; ovary glabrous. Capsule 3-angled, globose or angular-obovate in outline, 5-7 mm long, 5-8 mm wide, glabrous, appendages often absent, or if present, lobe-like at capsule apex, to 0.5 mm wide, crustaceous; seeds subglobose, 1.6-2 mm long, black, shiny; aril white, infundibular. The taxon flowers and fruits in autumn and winter (VicFlora, 2017).

#### Generation Length

The generation length of *Dodonaea hexandra* is estimated to be 10 to 30 years. This is based on the life form of a long-lived woody shrub, with a longevity of plausibly 30-40 years. This taxon is likely to experience disturbances such as fire, erosion, and extreme drought at a frequency of every 20-30 years. It is therefore estimated that generation length is unlikely to be more than 30 years, but might be as low as 10.

#### Distribution

The taxon is known in Victoria from only a few, recent collections in the Sunset Country, including Manya Flora Reserve, 25 km south east of Tutye, and near Millewa. The taxon is also present in South Australia.

#### Habitat

In Victoria the taxon grows in *Eucalyptus incrassata* and *Melaleuca uncinata* woodland communities on sand-dunes. At Manya Flora Reserve, the taxon grows in dune mallee scrub, with *E. costata*, *E. socialis* ssp. *viridans*, *E. leptophylla*, *E. dumosa*, *Babingtonia behrii*, *Podolepis capillaris*, *Callitris rhomboidea*, *Leptospermum coriaceum*, *Boronia caerulescens*, *Grevillea pterosterma*, *Podotheca angustifolia*, and *Melaleuca uncinata* (Stajsic pers.observ. 2009).

#### Threats

Threats to the taxon include the possible risk of repeated fire, and the increasing risk of recruitment failure due to drought stress. However, the risk of repeat fire is less demonstrable in Lowan Mallee habitat in Sunset country on

sandy profiles of lower fertility, which have lower fuel accumulation than in higher rainfall districts or on high nutrient sites (DEPI, 2014). The populations are also small and isolated.

### 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>(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> <p><i>based on any of the following:</i></p>			

### Evidence:

#### Eligible under Criterion A2 as Endangered

The population reduction over the past 30 to 90 years is suspected to be 50%, based on (b) and (c) above.

It is possible that as much as 50% of the potential habitat has been destroyed through past clearing. It is reasonable to assume there has also been a 50% loss of plants.

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

#### Eligible under Criterion A3 as Endangered

The population reduction over the next 30 to 90 years is projected to be 30 to 50%, based on (b), (c) and (e) above.

Future reduction of the taxon's population is based on the projected impacts of the identified threats.

#### Eligible under Criterion A4 as Endangered

The population reduction over any 30 to 90 year period, including both past and future (up to 100 years in the future), is estimated to be 30 to 50%, based on (b), (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

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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 B as Endangered

The Extent of Occurrence (EoO) is estimated to be 230 km<sup>2</sup>, and the Area of Occupancy (AoO) is estimated to be 12 km<sup>2</sup>, based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is inferred to be severely fragmented, is estimated to have 2 locations, and has a continuing decline in (iii) 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	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 C1 as Endangered

It is estimated that there are 250 to 500 mature individuals. There are approximately 100-200 mature plants at Manya Flora and Fauna Reserve. The collecting note on the MEL collection from Millewa South Bore Track

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indicate that the taxon is a "Common shrub on this track and nearby dune area, but not common/rarely seen elsewhere." It is plausible to assume that there might be at least 100 plants at Millewa South Bore Track, and possibly at least 50 plants from near Tutye.

A continuing decline of 10 to 25% is estimated to occur within 1 generation.

## Eligible under Criterion C2 as Endangered

It is estimated that there are 250 to 500 mature individuals.

The number of mature individuals is estimated to continue to decline, and the number of mature individuals in one subpopulation is fewer than 250.

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

## Evidence:

### Eligible under Criterion D as Endangered

It is estimated that there are 150 to 350 mature individuals.

**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.

VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Dodoniaea hexandra*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/2133e82e-6a50-4eed-86e6-9c7db9803f56>