



## *Olearia tubuliflora* Rayless Daisy-bush

### Taxonomy

*Olearia tubuliflora* (Sond. & F. Muell.) Benth.

This taxon is part of the *O. ramulosa* complex and is defined by the lack of ligulate florets. This is a questionable character, and the species concept requires revision to resolve differences with *O. sp. 1*, and taxa that occur in South Australia and Western Australia. However, it is reasonably well-defined and recognisable within Victoria.

### Current conservation status

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

### Proposed conservation status

Endangered in Victoria

Criteria A2c+3ce+4c; B2ab(i,ii,iii,iv,v); C1

### Species Information

#### Description and Life History

The taxon is a slender, erect shrub to c. 2.5 m high; branchlets cottony-pubescent, usually sparsely glandular. Leaves alternate, sessile or subsessile, linear or narrowly elliptic or obovate, 2-8 mm long, 0.5-2 mm wide, obtuse; upper surface green, glabrous or pubescent, sometimes scabrous; lower surface greyish, cottony-pubescent, partly to largely obscured by the revolute margins. Capitula 2-3 mm diam., sessile, solitary in leaf-axils, crowded toward branch-tips; involucre conical, 1.7-2.5 mm long; bracts 2-3-seriate, graduating, obtuse to acute, sparsely to moderately pubescent, green, often purple-tipped. Ray florets 3-5, tube shorter than style, ligules not developed; disc florets 3-6, yellow, longer than involucre. Cypsela cylindrical, 1-1.5 mm long, 6-ribbed, sparsely sericeous; pappus bristles whitish, c. 2 mm long. The taxon flowers from September to December (VicFlora 2017).

#### Generation Length

The generation length of *Olearia tubuliflora* is estimated to be 25 to 45 years (midpoint 35 years). The taxon recruits sporadically in response to exceptional weather conditions with an additional recruitment pulse following rare fire events. Its habitat can experience fire, but the taxon does not rely on fire as the principal cue for germination of seed in the soil-stored seedbank. Seed survival in the seedbank is somewhat limited by ant predation, reducing the size of the seedbank in this taxon. Generation time is largely influenced by longevity of between 25 and 35 years.

#### Distribution

The taxon is scattered through north-central Victoria in the Maryborough, Bendigo, and Avoca districts, with outlying occurrences in southern parts of the Brisbane Ranges and near Anglesea. It also occurs in South Australia and New South Wales (VicFlora 2017).

#### Habitat

The taxon usually occurs in box-ironbark forest on poor gravelly soils (VicFlora 2017).

### Threats

The taxon is subject to large habitat loss due to clearing of land during gold rush. It is found in areas that are now degraded due to weed invasion, hydrology changes, and soil erosion. There is also a high risk of mortality due to extreme weather, such as lack of rain.

### 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> <ul style="list-style-type: none"> <li>(a) direct observation [except A3]</li> <li>(b) an index of abundance appropriate to the taxon</li> <li>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</li> <li>(d) actual or potential levels of exploitation</li> <li>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</li> </ul>			

### Evidence:

#### Eligible under Criterion A2 as Endangered

The population reduction over the past 75 to 135 years is estimated to be 60%, based on (c) above.

Past decline is based on the amount of land clearing in the habitat for this taxon over the past 90 years.

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

#### Eligible under Criterion A3 as Endangered

The population reduction over the next 75 to 100 years is projected to be 50%, based on (c) and (e) above.

Future decline is based on mortality due to dry weather. Recruitment is also likely to be reduced due to poor habitat conditions.

#### Eligible under Criterion A4 as Endangered

The population reduction over any 75 to 135 year period, including both past and future (up to 100 years in the future), is estimated to be 60%, based on (c) above. The causes of reduction may not have ceased, be understood or be reversible.

# Olearia tubuliflora

## Rayless Daisy-bush

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 Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 13,582 km<sup>2</sup>, based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented considering its limited dispersal ability, the barriers to dispersal, and lack of habitat separating the subpopulations.

It is estimated to have 2 locations, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the impacts of the identified threats, and the taxon's little chance of natural regeneration.

#### Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 88 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon is severely fragmented, has 2 locations, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

# Olearia tubuliflora

## Rayless Daisy-bush

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 C1 as Endangered

It is estimated that there are 600 to 1,200 mature individuals. There are approximately 12 known records, with an estimated 50-100 plants per population. Herbarium notes often regard these populations to be small, but one noting 'very common'.

There is estimated to be a continuing decline of 30% within two generations, based on mortality due to dry weather, and recruitment likely being reduced due to poor habitat conditions.

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 Vulnerable

It is estimated that there are 600 to 1,200 individuals, and the taxon is estimated to be very restricted.



# *Olearia tubuliflora* Rayless Daisy-bush

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: *Olearia tubuliflora*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/c8b581df-2261-40d2-b305-cbaa589cb838>