Threatened Species Assessment

Olearia rugosa subsp. *allenderae*
Promontory Daisy-bush

Taxonomy

Olearia rugosa subsp. *allenderae* (J.H. Willis) Hawke ex Messina

The subspecies was described in 2013 following review of stellate-haired species of *Olearia* in Australia. It was previously treated at species rank (Willis 1967).

Current conservation status

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

Proposed conservation status

Endangered in Australia

Criteria A2b+3ce+4bce; B1ab(iii,v)+2ab(iii,v)

Species Information

Description and Life History

The taxon is a shrub, often rather spindly, to 2.5 m high; branchlets stellate-tomentose. Leaves elliptic, ovate or narrow-triangular, 16-45(-53) mm long, 9-25(-32) mm wide; base sagittate to cordate or truncate; margins deeply serrate to crenate; green above, wrinkled by impressed reticulate venation, tuberculate, simple-hispid, with or without finer scattered stellate hairs, grey to brownish and densely stellate-tomentose below; petiole 1.5-5 mm long.. Capitula 20-25 mm diam., terminal and/or upper-axillary, solitary or in corymbs, peduncles 0.5-5 cm long; involucre c. hemispherical, 4.5-5.5 mm long; bracts 4-6-seriate, graduating, stellate-tomentose entirely or only toward apex, margins often purplish. Ray florets 8-13, white, ligules 7-10 mm long; disc florets 10-16, yellow, or purplish, sometimes with a single stellate hair on the tip of each lobe. Cypsela cylindric, 5-6-ribbed, 2-2.5 mm long, moderately sericeous to glabrous; pappus bristles 4-5 mm long. The taxon flowers from October to November (VicFlora, 2019).

Generation Length

The generation length of *Olearia rugosa* subsp. *allenderae* is estimated to be 10 to 50 (midpoint 20) years. Generation length is based on the lifeform (i.e., small shrub) and age of reproductive maturity (c. 2 years). Very old (i.e., large with wide stem diameter) plants are not observed. Plants may die back to ground level and resprout (particularly where growing in swampy areas), as it has been noted that plants in swampy areas resprout from 'burnt out rootstocks' (MEL 0235815).

Distribution

Olearia rugosa subsp. *allenderae* is endemic to Victoria. It occurs in Wilsons Promontory, on the slopes of Mt Oberon and surrounds (e.g., Mt Bishop, Tidal River etc.), and Vereker Range (Messina et al., 2013).

Habitat

The taxon grows in swampy areas and gullies often associated with *Melalecua squarrosa*, but also extending into open woodland, often on track margins (Messina et al. 2013). It occurs in temperate forest and shrub dominated wetlands. The altitude ranges from 0-250 metres.

Threats

The bushfires of 2019/2020 are believed to have impacted more than 69% of the taxon's modelled habitat. The overall impacts of the fire are yet to be determined, and its recovery depends on the effective control of the impacts of feral herbivores and prevention of major soil and vegetation disturbance as a result of fire recovery activities.

The taxon is threatened by invasive species, including various deer species introduced into Wilson's Promontory, that are likely to damage wetland habitats, possibly impacting the taxon. Invasion by native tea tree into wetland habitats also present a possible threat taxon and may reduce the amount of suitable habitat. Increased fire frequency has the potential to remove/damage suitable habitat. However, the taxon seems to respond well to fire. Changes in frequency (i.e., multiple fire in quick succession) may remove the ability to reproduce (as the seed is short-lived in the seedbank), or high intensity fires may kill plants that would otherwise resprout. Drought is also likely to change the hydrology of wetlands, possibly reducing the potential habitat.

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 30 to 150 years is suspected to be 20 to 60 (midpoint 40%), based on (b) above.

The identified threats, including the 2019/20 fires, are strongly suggested to have led to a past loss.

Eligible under Criterion A3 as Endangered

The population reduction over the next 30 to 100 years is suspected to be 30 to 50%, based on (c) and (e) above.

The impact of introduced deer, tea tree invasion and changed fire regimes are likely to have some impact on the habitat quality, leading to a reduction of some individuals within populations.

Eligible under Criterion A4 as Endangered

The population reduction over any 30 to 150 year period, including both past and future (up to 100 years in the future), is suspected to be 30 to 60%, based on (b), (c) and (e) 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 and B2 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 70 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

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All plants of this taxon are situated within Wilsons Promontory National Park. The taxon is considered to occur in two locations, the Oberon area and the Vereker Range, as there are a range of threats affecting the taxon, and they may operate at different intensities and timing in the two areas.

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

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 2,000 to 10,000 (midpoint 5,000) mature individuals, but other thresholds under this criterion have not been met.

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 - 2014.* Department of Environment and Primary Industries, Melbourne. Retrieved from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf

Messina, A., Walsh, N. G., Hoebee, S. E., and Green, P. T. (2013). A morphological assessment of the *Olearia phlogopappa* complex (Asteraceae: Astereae). *Australian Systematic Botany, 26*, 31-80.

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