



## *Eremophila sturtii* Narrow-leaf Emu-bush

### Taxonomy

*Eremophila sturtii* R. Br.

An outlier from Swan Hill (1950) is of uncertain source (possibly cultivated). Two pre-1900 collections labelled 'Wimmera' and 'Sandhurst' are of doubtful provenance (VicFlora 2016).

### Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1992).

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

### Proposed conservation status

Critically Endangered in Victoria

Criteria A2c+4ce; C1+2a(i,ii); D

### Species Information

#### Description and Life History

Shrub to c. 3 m high, multi-stemmed, glabrous, viscid; branches sometimes obscurely tuberculate. Leaves alternate, c. terete or linear, mostly 1-3 cm long, 0.5-3 mm wide, acute, margins entire. Inflorescences 1(-2)-flowered; pedicels 5.5-18 mm long, straight or curved. Flowers zygomorphic; sepals ovate to oblanceolate, 5.5-11 mm long, subequal, usually obtuse, valvate, cream to purplish; corolla usually 12-15 mm long, pubescent outside, partially villous inside, usually pale lilac, spotted, upper lip 2-lobed; stamens 4, included, anthers reniform; ovary villous, style pilose or villous at least in proximal half. Fruit ovoid, 3.5-5 mm long, 2.5-3.5 mm diam., dry, villous. Flowers mostly spring and summer (VicFlora 2016).

Germination and establishment of seedlings is a very episodic event requiring consistent winter and spring rain following a year in which the adults have flowered profusely. Early growth is slow but a deep tap root forms at an early stage and even juvenile plants are drought resistant. Vegetative propagation occurs from root suckers which form readily if the roots are cut or disturbed. This allow mature plants to recover following fire. Seedlings are highly susceptible to fire since they have not yet developed a woody base (Cunningham *et al.* 1992).

#### Generation Length

The generation length of *Eremophila sturtii* is estimated to be 45 to 90 years. This is based on a plausible longevity exceeding 35 years, the reported ability to extend the life of mature adults beyond fire events or other disturbance events by root suckering and the infrequent episodic recruitment following consistent winter and spring rain following a year in which the adult has flowered profusely.

#### Distribution

The taxon is confined in Victoria to the far north-west. It was formerly known from Merbein near Mildura, but has apparently not been collected from there since 1935 (VicFlora 2016).

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The SAC (1992) noted "It is not common in Victoria and occurs only in small populations, with scattered isolated individuals. By far, most *E. sturtii* occurs on private land or adjoining public land (e.g. road reservations), but some occurs on broad-area public land.'

## Habitat

The taxon is a component of Belah (*Casuarina pauper*) and Sugarwood (*Myoporum platycarpum*) woodland on slightly higher ground of the Murray River floodplain (VicFlora 2016).

## Threats

The taxon has suffered severe historic depletion through habitat loss to agriculture. The SAC (1992) noted 'The taxon occurs primarily on private land and adjoining road reserves, where it is threatened by associated construction and management.'

Current and future threats include incremental habitat loss to agriculture, particularly for occurrences on freehold land, agricultural intensification, road management activity, fuel reduction activity, competition from exotic weeds and over-abundant natives and the increasing risk of adult mortality and recruitment failure in response to repeat fire events and extreme drought events. Browsing by herbivores is considered a low risk since the taxon is rarely utilised by any animal, even in periods of acute feed shortage (Cunningham *et.al.* 1992).

## 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:

### Eligible under Criterion A2 as Critically Endangered

The population reduction over the past 135 to 270 years is estimated to be 80%, based on (c) above.

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Historic decline through habitat loss to agriculture is thought to be significant. The period of alienation in the north-west Mallee falls well within the last 3 generations for the taxon.

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 100 years is projected to be 30 to 80% (midpoint 50%), based on (c) above.

Future reduction of the taxon's population is based on the identified current and future threats.

### Eligible under Criterion A4 as Critically Endangered

The population reduction over any 135 to 270 year period, including both past and future (up to 100 years in the future), is estimated to be 75 to 95%, based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

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 552 km<sup>2</sup>, based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The Area of Occupancy (AoO) is estimated to be 16 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

Any two of (a), (b) or (c) above are also satisfied.

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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:

#### Eligible under Criterion C1 as Critically Endangered

It is estimated that there are 14 to 48 (midpoint 23) mature individuals. The plants occur in four ten-minute grids, in small and scattered populations. There may be less than 100 plants in total, mostly on private land (SAC 1991).

A continuing decline of 15 to 45% is estimated to occur within one generation.

#### Eligible under Criterion C2 as Critically Endangered

It is estimated that there are 14 to 48 (midpoint 23) mature individuals.

The number of mature individuals is estimated to continue to decline, based on the identified current and future threats which include incremental habitat loss to agriculture, particularly for occurrences on freehold land, agricultural intensification, road management activity, fuel reduction activity, competition from exotic weeds and overabundant natives and the increasing risk of adult mortality and recruitment failure in response to repeat fire events and extreme drought events.

The number of mature individuals in each subpopulation is 50 or fewer and the percentage of mature individuals in one subpopulation is 90-100 %.

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



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## Evidence:

### Eligible under Criterion D as Critically Endangered

The taxon is estimated to have 14 to 48 (midpoint 23) mature individuals.

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

## References

Cunningham, G.M., Mulham, W.E., Milthorpe, P.L. and Leigh, J.H. (1992). *Plants of Western New South Wales*. Inkata Press.

SAC (1992). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Flora and Fauna Guarantee, Nomination No. 188 *Eremophila sturtii*.

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Eremophila sturtii*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/27de204f-06c4-4212-a2cc-bb17e5eda01b>