

## *Calorophus elongatus* Long Rope-rush

### Taxonomy

*Calorophus elongatus* Labill.

### Current conservation status

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

### Proposed conservation status

Endangered in Victoria

Criterion B2ab(iii)

### Species Information

#### Description and Life History

The taxon is a perennial, dioecious, scrambling herbs. Rhizomes shortly creeping, glabrous. Stems green, thin and wiry, branched and flexuose, somewhat tangled, up to 180(-300) cm long. Leaves reduced to persistent sheathing bracts, 8-30 mm long, pale brown, closely appressed; apex 3-25 mm long, patent or strongly reflexed, subulate. Male and female inflorescences  $\pm$  similar. Male spikelets 1 or 2 together in axils of leaf-like bracts; each spikelet 1-flowered and subtended by 2 glume-like floral bracts (1 reduced). Male flowers with 6, firm, brown perianth parts and with anthers exerted on slender filaments. Female spikelets terminal, pedicellate, solitary, 4-8 mm long, 1-flowered and subtended by 2 glume-like floral bracts. Female flowers with 6, firm, brown perianth parts; staminodes 3; ovary unilocular; style with 3 branches. Fruit is a small ovoid nut, striate. The taxon flowers from February to July. The taxon has a similar habit to *Lepyrodia flexuosa* and *Empodisma minus* (VicFlora 2018).

#### Generation Length

The generation length of *Calorophus elongatus* is estimated to be 35 to 70 years. This is based on a longevity of at least 30-50 years, and the likelihood that the taxon resprouts from the rhizome following most fire events. The taxon is likely to recruit episodically post-fire, and also sporadically and opportunistically in response to localised site disturbance events and seasonal conditions. Pre-settlement fire intervals are likely to have been in the 35-70 year range.

#### Distribution

The taxon is highly disjunct in Victoria, where it is restricted to the western Otways and coastal East Gippsland, extending to far southern NSW. The taxon is also widespread in western Tasmania (VicFlora 2018).

#### Habitat

The taxon occurs in leached sands, peat bog and poorly drained areas in *Eucalyptus baxteri* and *E. obliqua*-dominated forests, with an understorey of *Melaleuca squarrosa* and *Leptospermum continentale* (VicFlora 2018).

#### Threats

The taxon is a habitat specialist, dependent on the hydrological stability of its wetland habitat. Key threats to the hydrology of this habitat include climatic drying, increasing frequency, intensity and landscape scale of bushfire in

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response to climate change, inappropriate fire regimes and reduced runoff from regenerating forests following extensive bushfires.

Spatial analysis of likely habitat for the taxon on all land tenures indicates that 55% occurs within the CAR reserve system, including parks and reserves, special protection zones and areas excluded from harvesting by prescription under the Victorian Code of Practice for Timber Production 2014 (the Code). Species-specific protections for *C. elongatus* are included in the Code in Gippsland FMAs. Other more general prescriptions such as protection and buffering of and waterways also provide protection from timber harvesting.

In recent years, modified harvesting and forest regeneration practices have been implemented in native forest that are designed to further mitigate the potential threat from forestry operations to threatened species and their habitats.

### 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 style="text-align: center;"><i>based on any of the following:</i></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>			

### Evidence:

#### Ineligible under Criterion A

There is insufficient evidence to determine whether there has been or will be a reduction in population sufficient to meet any threshold for Criterion A.

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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 B1 as Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 6754 km<sup>2</sup>, based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the regional and landscape scales. All known occurrences are isolated from each other at spacings greatly exceeding the dispersal range of the taxon, which has no specialised mechanism for long-distance dispersal. This precludes the possibility of recolonisation in the event of local extinction.

It is estimated to have 2 locations. It has a continuing decline in (iii) above, due to the identified threats.

#### Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 48 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has 2 locations and has a continuing decline in (iii) above.

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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:

#### Ineligible under Criterion C as Data Deficient

There is insufficient evidence to determine the number of mature individuals.

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 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. [https://www.environment.vic.gov.au/data/assets/pdf\\_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf](https://www.environment.vic.gov.au/data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf)

VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Calorophus elongatus*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/880ae95b-cb17-4483-b36a-9b219cd33542>