Threatened Species Assessment

Lobelia dentata
Toothed Lobelia

Taxonomy

Lobelia dentata Cav.

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 B1ab(iii)+2ab(iii)

Species Information

Description and Life History

Erect, glabrous to sparsely papillose annual, 10-60 cm high; stems solitary or few from near base. Leaves oblanceolate to obovate-spathulate, c. 6-35 mm long, 2-12 mm wide, toothed (but reducing and c. entire up stem); petiole indistinct. Flowers bisexual, in terminal and sometimes axillary 4-13-flowered racemes; pedicels 3-35(-45) mm long, glabrous or rarely papillose. Calyx-lobes 1.8-5 mm long, entire; corolla 2-lipped, (10-)13-28 mm long, usually dark blue, rarely white; upper 2 lobes short, strongly recurved, lower 3 lobes spreading, oblong to oblanceolate, the central lobe longest, (5-)8-15 mm long, 1.2-5 mm wide, lateral lobes falcate, tube 5-9(-15) mm long, split almost to base, glabrous to minutely pubescent internally towards base; filaments 3.5-8 mm long, anther tube c. 1.7-2.5 mm long. Capsule broadly and obliquely obovoid, c. 5-8 mm long; seeds c. ellipsoid, 0.3-0.45 mm long, brown, very faintly ridged to almost smooth. Flowers most of year (VicFlora 2018).

Generation Length

The generation length of *Lobelia dentata* is inferred to be 10 to 50 (midpoint 35) years. The taxon is described as an annual although it mimics many geophytes which emerge seasonally from a persistent tuber. The taxon is inferred to germinate from a long-persistent soil-stored seedbank in response to fire, localised soil disturbance or excellent seasons.

Recruitment frequency is difficult to estimate although pre-settlement fire intervals of 35-50 years provide an estimate of the upper bound,

Distribution

The taxon is restricted in Victoria to East Gippsland, where it occurs in lowland and foothill districts, from Bairnsdale east to the NSW boarder.

Habitat

The taxon occurs predominantly in open-forest on sandy or rocky substrates. It often appears abundantly after fires or other forms of disturbance (VicFlora 2018).

Threats

Although well adapted to infrequent fire and localise site disturbance, the taxon is likely to be threatened by increasing fire frequency and extreme drought stress, potentially resulting in recruitment failure, adult mortality or failure to flower, seedbank depletion and local extinction. The taxon may also be threatened by casual browsing by rabbits or other exotic herbivores.

Although a significant proportion of the Victorian occurrences have been severely burnt in early 2020, the taxon is not likely to be severely threatened by a single fire event.

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 A3 as Endangered

The population reduction over the next 30 to 100 years is suspected to be 15 to 45%, based on (c) above.

Future decline in population size is difficult to estimate with any confidence since the identified threats are likely to act stochastically and with unpredictable intensity.

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 estimated to be 15 to 70% (midpoint 35%), based on (c) above.

The taxon is unlikely to have suffered significant historic decline through habitat loss since most occurrences are on public land. Some decline may have occurred in response to early impacts of the identified threats.

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 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 3,254 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented naturally at the landscape scale with the taxon likely to be dispersed by wind or ants at the metre or kilometre scales.

It is estimated to have 1 location. It has a continuing decline in (iii) above, based on the current and projected impact of the identified threats.

The taxon is severely fragmented

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 48 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has 1 location and has a continuing decline in (iii) 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	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

No reliable estimate of the total population size for the taxon is available.

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. It has a restricted distribution, with a single location, such that this restriction makes the taxon capable of becoming Critically Endangered or Extinct within a time frame of one or two generations, in response to the impact of the identified threats, notably increasing fire frequency and extreme drought stress.

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 (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Lobelia dentata*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/b7d9cdc4-6040-4019-abad-1ffac86740df