

## *Wahlenbergia densifolia* Fairy Bluebell

### Taxonomy

*Wahlenbergia densifolia* Lothian

### Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1991).

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

### Proposed conservation status

Endangered in Victoria

Criteria A3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

### Species Information

#### Description and Life History

The taxon is a rhizomatous perennial; stems simple (rarely 1-2-branched), erect, to 20 cm high, minutely pubescent near base, otherwise glabrous, leafless in upper half; leaves very crowded toward base, oblong to narrowly obovate, 2-12 mm long, 0.5-2 mm wide, glabrous, thickish; margins minutely granular, often with 1-3 small callus-teeth. Hypanthium obconical, 1.5-3.5 mm long, glabrous; calyx-lobes erect, narrow-triangular, 2-4.5 mm long, glabrous; corolla campanulate, purplish-blue, tube 2.5-6.5 mm long, equal to or longer than calyx-lobes, lobes elliptic to obovate, 8-15 mm long, 3-7.5 mm wide, acute or obtuse; style 4-8 mm long, somewhat constricted about midway, lobes 2(or 3), oblong. Capsule obconical, 3.5-8 mm long, 2.5-4 mm wide. The taxon flowers from January to February (VicFlora 2017).

#### Generation Length

The generation length of *Wahlenbergia densifolia* is estimated to be 60 to 70 years. This is based on a longevity that is plausibly up to 100 years or more. It should be noted that recruitment is rarely observed, the taxon is long-lived, and there is little field evidence of natural mortality.

#### Distribution

The taxon is rare in Victoria, where it is apparently confined to the Nunniong Plateau, Dargo High Plain area, and Cobungra area. It also occurs in New South Wales in the Mt Kosciusko region (VicFlora 2017).

#### Habitat

The taxon occurs on water-retentive basaltic soils in grasslands and herbfields in the Victorian Alps (VicFlora 2017).

#### Threats

The taxon may have suffered significant historic decline in response to high intensity grazing by cattle or sheep on the Dargo High Plains, the Nunniong Plateau, and the Cobungra district. It is considered highly susceptible to rabbit grazing, with its reproduction being mainly vegetative. The most significant long-term threat to the taxon is climatic

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drying of water-retentive basaltic soils in grasslands and herbfields. It is also very prone to weed invasion accompanying the drying of high fertility basaltic soils.

### 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 A3 as Endangered

The population reduction over the next 100 years is projected to be 60 to 80% (midpoint 70%), based on (c) and (e) above.

Future decline is based on the projected impact of the identified threats, notably the climatic drying of water-retentive basaltic soils and grazing by rabbits.

There is insufficient evidence to support an estimate of past decline, although it is likely to have been significant.

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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 B as Endangered

The Extent of Occurrence (EoO) is estimated to be 1,035 km<sup>2</sup>, and the Area of Occupancy (AoO) is estimated to be 52 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is severely fragmented naturally at the subregional and landscape scales. Geographically discrete occurrences are separated at distances likely to exceed the dispersal range of the taxon, which has no specialised mechanism for long-distance dispersal.

Two locations can be identified based on land tenure, with occurrences outside the Alpine National Park (NP) at continuing risk of alpine grazing, contrasting with occurrences within the Alpine NP.

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

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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 no available estimate of the current population size for the taxon.

Criterion-D. Very small or restricted population <sup>a</sup>		Critically Endangered <sup>a</sup>	Endangered <sup>a</sup>	Vulnerable <sup>a</sup>
Number of mature individuals (observed or estimated) <sup>a</sup>		< 50 <sup>a</sup>	< 250 <sup>a</sup>	< 1,000 <sup>a</sup>
D2: Only applies to the VU category <sup>f</sup> 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. <sup>a</sup>		- <sup>a</sup>	- <sup>a</sup>	D2: Typically: <sup>f</sup> AoO < 20 km <sup>2</sup> or number of locations ≤ 5 <sup>a</sup>

## 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.

SAC (1991). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 175 *Wahlenbergia densifolia*

VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Wahlenbergia densifolia*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/3e07d78b-caf4-4bf0-8b78-79d82bfff940>