Threatened Species Assessment

Euphrasia gibbsiae subsp. *subglabrifolia*
Baw Baw Eyebright

Taxonomy

Euphrasia gibbsiae subsp. *subglabrifolia* (Du Rietz) W.R. Barker

Current conservation status

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

Proposed conservation status

Endangered in Australia

Criterion B1ab(iii)+2ab(iii)

Species Information

Description and Life History

The taxon is a perennial herb 4-18 cm high; branches erect, ascending or decumbent arising from ground-level; glandular hairs sparse to dense on calyces, bracts and upper leaves and sometimes branches below inflorescence, but not lower down. Upper leaves with 1-2 pairs of teeth, base long attenuate to cuneate. Calyx 5-11 mm long, corolla 10-13 mm long along upper side, white, with yellow blotch on lower lip, and 3-4 purple longitudinal striations on each lobe; anthers 1.4-2.0 mm long, the area about the connectives glabrous. Capsule 6-11 mm long, glabrous or setose in apical parts. Flowers (Nov.-)Dec.-Jan (VicFlora 2014).

Generation Length

The generation length of *Euphrasia gibbsiae* subsp. *subglabrifolia* is estimated to be 25 to 35 years. This is based on the expectation that the shrubs on which the taxon would be parasitic are likely to live between 20 and 50 years. Therefore, perhaps the taxon would live for a similar amount of time, and the generation time would be somewhere within that lifespan.

Distribution

The taxon is endemic to the Baw Baw Plateau (VicFlora 2014).

Habitat

The taxon is confined to *Sphagnum* bogs and subalpine wet heathland (VicFlora 2014).

Threats

Climatic drying and warming is the main threat to the taxon, as its subalpine wetland habitat is dependent on cool temperatures and high levels of moisture. With increased temperature and lower rainfall and snow, the taxon will have no habitat to migrate to as it is already near the highest altitudes, and there are no sites at even higher altitudes to offer cooler temperatures.

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:

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.

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 44 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

It is estimated to have two locations, as the threat of increase in temperature and decrease in rainfall and snowfall apply across its range and can rapidly affect all individuals of the taxon present to a similar extent. Areas in drainage lines may be spared the drying effects for longer than more exposed sites.

It has a continuing decline in (iii) above, based on the impacts of increasing global temperatures.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 44 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, the taxon has two locations, 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

It is estimated that there are 3,900 to 6,500 mature individuals, but other thresholds under this criterion have not been met. This estimation is based on a herbarium collection from 2009 (Jeanes 2174) where it was noted that there were several hundred plants along 200 metres of walking track, which is considered here to be equivalent to around 300 to 500 plants. Records of *E. gibbsiae* subsp. *subglabrifolia* can be arranged into around 13 clusters of 200 metre stretches that may each have a similar number of plants, giving a total of between 3,900 and 6,500 mature individuals.

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 D 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

VicFlora (2014). Flora of Victoria, Royal Botanic Gardens Victoria: *Euphrasia gibbsiae* subsp. *subglabrifolia*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/b78a3cd4-0ad2-436f-a375-aef47690725b