



Gratiola nana Matted Brooklime

Taxonomy

Gratiola nana Benth.

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(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a prostrate mat-forming perennial herb, rooting at nodes, with sessile glands obscure or sporadically with golden heads, otherwise mainly on the rachis; pedicels and sepals glabrous or sparsely to moderately finely glandular-hairy. Leaves elliptic to narrow-oblong, 0.2-1.1 cm long, 1-3 mm wide, base cuneate, margins more or less entire, sessile. Flowers single in bract axils; bracteoles 0.5-4 mm long. Sepals 3-5 mm long; corolla 7-12 mm long, tube green-yellow, dark-striped, the lobes pink or whitish; staminodes usually 2. Capsule broad-ovoid, 3.5-5 mm long; style c. 2-2.5 mm long. The taxon flowers in summer (VicFlora 2017).

Generation Length

The generation length of *Gratiola nana* is estimated to be 35 to 50 years. This is based on a plausible longevity of 35-50 years or more with recruitment from a soil-stored seedbank. The taxon is likely to recruit opportunistically in response to seasonal conditions and localised site disturbance events, with additional episodic recruitment pulses after very infrequent fire events.

Distribution

The taxon is restricted in Victoria to the eastern alpine and subalpine areas e.g. Snowy Range, Dargo High Plains, Nunniong Plateau, and the Cobberas Mountains. Pre-1900 collections were supposedly made at the Grampians and at Curdies River in the west, and it has also been collected from NSW, Tasmania (VicFlora 2017), the ACT, and New Zealand.

Habitat

The taxon is restricted in Victoria to shallow pools and depressions in grasslands, or on margins of wet heathland communities in eastern alpine and subalpine areas (VicFlora 2017). Limited quadrat data suggests that the taxon typically occurs at low density, with projective foliage cover of less than 1% at the quadrat scale, and rarely approaching 5% cover.

Threats

The taxon is unlikely to have suffered any significant historic decline through habitat loss to agriculture since all reliable records are from public land. Almost all sites, however, have been subject to habitat degradation through stock grazing and the impact of feral horses throughout the Victorian range of the taxon.

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The habitat of the taxon is highly susceptible to pugging and targeted browsing by stock, feral horses, and increasingly by Sambar Deer (*Rusa unicolor*), throughout the restricted Victorian range of the taxon, exposing the habitat to weed invasion. The habitat is also susceptible to excavation by feral pigs. The taxon is a habitat specialist, and its consistent association with wet grasslands, subalpine heathlands and stream banks renders it highly susceptible to the impact of climatic drying and warming, resulting in a projected incremental contraction in the local extent of suitable habitat. As the habitat range of the taxon dries out, small herbaceous taxa are expected to be strongly outcompeted by vigorous native and exotic shrubs and more drought-tolerant herbs.

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> <ul style="list-style-type: none"> (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 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 3,664 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at the subregional and landscape scales, with geographically isolated occurrences at separations likely to exceed the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal. The only likely dispersal of seed is by water within localised sub catchments, which precludes the opportunity for recolonisation in the event of local extinction within any sub catchment unit.

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

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 76 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 (i), (ii), (iii), (iv) and (v) 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

In the absence of any longitudinal monitoring data, there is no available estimate of population size for the taxon in Victoria.

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 ² 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. 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



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VicFlora (2017) Flora of Victoria, Royal Botanic Gardens Victoria: *Gratiola nana*. Retrieved from:
<https://vicflora.rbg.vic.gov.au/flora/taxon/2f234a8a-cb15-4614-a541-6676a85ef5f8>