

Geranium sp. 6 Delicate Crane's-bill

Taxonomy

Geranium sp. 6 sensu L.P. Smith (1999)

The diagnostic feature of this taxon is the presence of scattered long patent glandular hairs on the pedicel, peduncle, and often upper stems. The introduced *G. dissectum* also has glandular hairs covering upper stems and inflorescences, but these extend to the fruit rostrum, which is lacking on *Geranium* sp. 6 (VicFlora 2019).

Current conservation status

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

Proposed conservation status

Endangered in Australia

Criteria A2ce+3ce+4ce; B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a decumbent to ascending perennial; stems to 40 cm long, with short retrorsely appressed eglandular hairs and occasional long, patent glandular hairs; taproot napiform to c. spherical. Leaves suborbicular, reniform or c. deltoid, 1-4 cm long, palmatifid to palmatisect with 3-5(-7), trifid and sometimes toothed primary lobes; ultimate lobes obtuse to acute; upper surface with sparse, short, curved to appressed hairs; stipules narrow-triangular, long-acuminate. Flowers solitary or paired; peduncles 1.5-4.5 cm long; pedicels 1.5-2.5 cm long. Sepals broad-ovate to narrow-ovate, 4.5-5.5 mm long, acute, with few short spreading hairs and scattered longer hairs, mucro to 0.5 mm long; petals obovate, 5-5.5 mm long, bright pink grading to white; anthers lemon. Fruits 11-14 mm long; mericarps pilose with scattered long hairs, suture margins not ciliate; seed dark brown to black, smooth with very shallow c. oblong alveolae. The taxon flowers from October to January (VicFlora 2019).

Generation Length

The generation length of *Geranium* sp. 6 is estimated to be 20 to 50 years. This is Inferred from a plausible longevity of 20-50 years, noting root development appears to be less robust than in *G. retrorsum* and *G. solanderi*.

Distribution

The taxon is apparently endemic in Victoria, and is recorded from sheltered sites from central to north-east Victoria at the Strathbogie Ranges, Benalla, Wangaratta, and Beechworth (VicFlora 2019).

Habitat

Although the habitat range of the taxon is not well understood, the taxon appears to be a habitat specialist restricted to moist sheltered sites on old alluvial outwash terraces on granite-derived soils. Quadrat and list data suggest the taxon may be associated with *Eucalyptus camaldulensis*, *E. blakelyi*, *E. camphora*, *E. microcarpa*, *E. melliodora*, or *E. goniocalyx* on the northern plains, and in the Tawonga district with *E. dives*, *E. globulus* subsp. *bicostata*, *E. manniifera* and *E. radiata* subsp. *robertsonii*. Understorey composition includes an admixture of wetland and dryland taxa at the quadrat scale and most sites are moderately weedy, reflecting their occurrence in fragmented rural landscapes.

Threats

The taxon has suffered significant historic decline through habitat loss to intensive agriculture, and habitat modification through low intensity agricultural activity across its apparently restricted range. It may also be threatened by weed invasion since most sites occur in fragmented rural landscapes where they are exposed to a range of edge effects, and the moist habitat of the taxon is particularly susceptible to hydrological modification in response to climatic drying.

The taxon may also be at risk from seedbank depletion since it has relatively few flowers and therefore a limited seed set in comparison with its congeners. It is also likely to have a shorter longevity than its congeners in similar plains habitats such as *G. retrorsum* and *G. solanderi* on account of its apparently less robust root development. This is likely to make the taxon inherently vulnerable to environmental stresses to which its congeners are better adapted.

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 A2 as Endangered

The population reduction over the past 60 to 150 years is estimated to be 30 to 50%, based on (c) and (e) above. Past decline is based on the past impact of the identified threats.

The causes of the reduction may not have ceased, be understood or be reversible.

Eligible under Criterion A3 as Endangered

The population reduction over the next 60 to 100 years is projected to be 30 to 50%, based on (c) and (e) above.

Future decline is based on the projected impact of the identified threats.

Eligible under Criterion A4 as Endangered

The population reduction over any 60 to 150 year period, including both past and future (up to 100 years in the future), is estimated to be 30 to 50%, based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

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 Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 11,661 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally and anthropogenically at the landscape scale since all occurrences are isolated from each other at separations greatly exceeding the dispersal range of the taxon. Dispersal is at the metre scale, since it is based on explosive ejection of seed by the apically attached awn on each mericarp.

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 hydrological modification in response to climatic drying, weed invasion, and edge effects.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 32 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon 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

There is no available estimate of current population size.

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 (2019) Flora of Victoria, Royal Botanic Gardens Victoria: *Geranium* sp. 6. Retrieved from:
<https://vicflora.rbg.vic.gov.au/flora/taxon/64d8ed47-be54-424f-9830-190425c07ddc>