Threatened Species Assessment

Glycine canescens
Silky Glycine

Taxonomy

Glycine canescens F.J. Herm.

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1993).

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

Proposed conservation status

Critically Endangered in Victoria

Criteria A2ace+4ace; C1

Species Information

Description and Life History

The taxon is a trailing or twining herb, wholly silky-strigose; stems slender, non-stoloniferous, hairs mostly grey, often intermixed with rusty ones. Leaves pinnately trifoliolate, petiole 3-20 mm long; leaflets filiform to narrowly elliptic-lanceolate, 2-6 cm long, 2-8 mm wide, apices acuminate, acute or rounded; terminal leaflet on petiolule 1-8 mm long; lateral leaflets sessile to subsessile; stipellae present on all petiolules; leaflet reticulation obscure. Racemes 6-12-flowered; peduncle 3-7 cm long. Flowers on pedicels 1-2 mm long, usually arranged loosely and distally on rachis; calyx 4-5 mm long, lower 3 teeth equalling to slightly exceeding the tube; petals pinkish-purple to mauve, fading to blue; standard 6-9 mm long; keel shorter than wings. Pod linear, 2-4 cm long, 3-4 mm wide, slightly compressed; seeds 3-10, short-obloid to quadrate, c. 3 mm long, smooth and shining or minutely muricate, black or mottled. Flowers mostly early spring (VicFlora 2018).

Very little is known of the ecology of the taxon, but it is clearly highly palatable to grazing animals and is unlikely to survive under heavy, continuous grazing. The appearance of seedlings (in excess of 100 plants) outside the Mournpoul Gate Exclusion Plot in 1984 must have been due to buried seed, which may lie dormant for long periods. Cunningham et al. (1982) says that the taxon usually occurs as scattered plants through the various communities in which it is present, and is seldom abundant (SAC 1993).

Generation Length

The generation length of *Glycine canescens* is inferred to be 30 to 35 years. This is based on the taxon's longevity which has been observed to exceed 30 years, and an inference, based on field observations, that recruitment is more or less continuous and cued by small scale disturbance events. The habitat is neither fire prone nor fire-promoting, and the taxon is therefore inferred to recruit independently of fire frequency.

Distribution

The taxon has been recorded in five 10 minute grids, mostly in the north-west of Victoria. Populations have varied from a few individuals to over 100 plants. The data presented on distribution and abundance are the result of comprehensive surveys, and provide clear evidence that the taxon is rare in terms of abundance and distribution. Some of the populations exist in areas not managed primarily for conservation purposes, including on private

property and along roadsides. The taxon appears highly palatable to grazing animals, and several populations may be susceptible to agricultural development and roadwork maintenance (SAC 1993).

Habitat

The taxon extends over much of inland Australia where it is common on sandy soil, especially dry watercourses, often with *Triodia*. The presence of the taxon on sand hills near the Murray River may be correlated with a relatively high ground water table. At the Mournpoul Gate Exclusion Plot in Hattah-Kulkyne National Park, the taxon occurs on red sandy loam among *Callitris preissii,* which was planted onto the fenced area early in the 1960s. Originally the area was open grassland with scattered *Acacia bivenosa* and *Dodonaea angustissima*.

The southern-most stand of the taxon in Victoria is remarkably disjunct from the Hattah-Kulkyne stand and the stand near the Murray River at Colignan; it occurs on a creek bank on recent alluvium, loamy sandy with gravel patches, in very disturbed *Eucalyptus canaldulensis* woodland, part of which has been bulldozed to in-fill old depressions and creek branches. The understorey is herbaceous with many introduced weeds. The site is flooded occasionally during winter and spring, but Carmanuel Creek is frequently dry (SAC 1993).

Threats

The taxon is highly palatable and is therefore subject to browsing by rabbits, kangaroos, goats, and sheep. It is also threatened by weed invasion by both perennial and annual exotics, and some subpopulations may be threatened by agricultural intensification. Climatic drying and warming may also increase the risk of recruitment failure and adult mortality in response to extreme drought stress. All these threats can result in seedbank depletion and the permanent elimination of individual subpopulations.

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 A2 as Critically Endangered

The population reduction over the past 90 to 105 years is inferred to be 60 to 90% (midpoint 80%), based on (a), (c) and (e) above.

Past decline is based on the habitat loss of sandy rises to agriculture, particularly within the core area of the Nangiloc-Colignan irrigation district. The Hattah district has been heavily grazed since the 1850s, predominantly by sheep, and major clearance of *Callitris* has occurred post-1918.

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 90 to 100 years is projected to be 50 to 75%, based on (c) and (e) above.

Future decline is based on the identified key threats to the taxon, which can result in seedbank depletion and the permanent elimination of individual subpopulations.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 90 to 105 year period, including both past and future (up to 100 years in the future), is inferred to be 50 to 80%, based on (a), (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 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 B as Endangered

The Extent of Occurrence (EoO) is estimated to be 119 km², and the Area of Occupancy (AoO) is estimated to be 36 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented, has 1 location, and has a continuing decline in (i), (ii), (iii), (iv) and (v) 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:

Eligible under Criterion C1 as Critically Endangered

It is estimated that there are 50 to 200 mature individuals, based on field observations of individual population sizes of around 35 or less mature individuals. Additionally, quadrat data indicates that the taxon is typically very rare at the quadrat scale.

There is estimated to be a continuing decline of 15 to 25% within one generation.

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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 Endangered

It is estimated that there are 50 to 200 mature individuals.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

References

Cunningham, G.M., Mulham, W.E., Milthorpe, P.L. and Leigh, J.H. (1982). *Plants of western New South Wales.* Soil Conservation Service of NSW. NSW Government Printing Office

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VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Glycine canescens*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/4c3c74e3-5606-4aff-971c-59c448033bf3