

Trigonella suavissima Sweet Fenugreek

Taxonomy

Trigonella suavissima Lindl.

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

Species Information

Description and Life History

The taxon is a decumbent or ascending herb; stems 5-50 cm long, branched, slightly hairy to glabrous. Petioles mostly 2-5 cm long; leaflets obovate to obcordate, 4-20 mm long, 2-15 mm wide, upper surface glabrescent, lower surface usually hairy, margins denticulate, apices rounded or emarginate, mucronate; stipules triangular, hastate, 2-6 mm long, coarsely toothed. Inflorescences 2-8-flowered axillary clusters, shortly pedunculate; flowers on pedicels 0.5-2 mm long; calyx 3-5 mm long, conspicuously 5-veined, sparsely hairy, teeth narrow-triangular, longer or shorter than tube; corolla 4-6 mm long, pale yellow. Pod 9-18 mm long, c. 2 mm wide, curving upwards, laterally compressed, prominently veined, glabrous or sparsely hairy; seeds 3-7, oblique-rhomboid, c. 1 mm long, smooth, brown. The taxon flowers mainly September to November (VicFlora 2017).

Generation Length

The generation length of *Trigonella suavissima* is estimated to be 10 to 20 years (midpoint 15 years). This is based on a plausible longevity of (1-) 5-10 years and the inference that the taxon recruits episodically following flood events or heavy summer rains at intervals determined, at the time of European settlement, by peak flood events or La Niña events.

Although Cunningham et al. (1992) describe the taxon as an annual in pastoral districts of Western New South Wales, it is likely to behave as a facultative annual particularly in the arid zone or, potentially, as a short-lived perennial in more temperate regions with more reliable winter-spring rainfall.

Distribution

The taxon is restricted in Victoria to the drier north-west of the state. It occurs in all mainland states (VicFlora 2017).

Habitat

The taxon is apparently confined in Victoria to the drier north-west of the state where it grows along seasonal watercourses, floodplains, and depressions (VicFlora 2017). Limited site data indicates the taxon is frequently associated with *Eucalyptus camaldulensis* (River Red-gum), *E. largiflorens* (Black Box), *Centipeda cunninghamii* (Common Sneezeweed), *Chenopodium glaucum* (Glaucous Goosefoot), *C. nitrariaceum* (Nitre Goosefoot), *Duma florulenta* (Tangled Lignum), *Dysphania pumilio* (Clammy Goosefoot), *Eleocharis acuta* (Common Spike-sedge),



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Eragrostis dielsii (Mallee Love-grass), *Heliotropium curassavicum* (Smooth Heliotrope), *Lachnagrostis filiformis* (Common Blown-grass), and *Polygonum plebeium* (Small Knotweed).

Threats

The taxon is thought, from its restriction to fertile soils in highly fragmented rural landscapes, to have suffered severe historic decline in response to habitat loss to agriculture and hydrological modification of its flood-dependent habitat. Current and future threats include incremental habitat loss and degradation, herbivory, and weed invasion.

Cunningham et al. (1992) notes that, in rangeland pastures in western New South Wales, the taxon 'commonly forms dense swards after good winter-spring rains and is particularly prevalent after cool-season floods, often forming almost monospecific stands over flooded land from which the water has recently receded. The taxon is quite palatable and is readily eaten by stock. It is regarded as a nutritious and fattening fodder, although its appearance in quantity depends entirely on heavy rains or floods.' This suggests the taxon is susceptible to browsing pressure from stock, goats, rabbits, and macropods on account of its high palatability.

The habitat is also prone to destructive activity of feral pigs which are observed to excavate ephemeral wetland sites in search of subterranean storage organs. Site data also indicates that occurrences in fragmented landscapes are frequently weedy, suggesting the taxon may be threatened by competition from aggressive exotic weeds. The taxon may, however, have some resilience under competition from some aggressive exotic weeds given its rapid growth following seed recruitment and the possibility that it may have some toxicity when young.

The greatest current and future threat to the taxon, however, is the reduced reliability of flood events in response to water diversion for agriculture, including irrigation, and town water supply and environmental water allocations which fail to replicate pre-settlement intensity, frequency, and seasonality. The taxon may be threatened by changing seasonality of rainfall events as reliable winter and spring rainfall is replaced by summer rainfall events. The reliability of flood regimes is further compromised by climatic drying.

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> <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:

Eligible under Criterion A2 as Endangered

The population reduction over the past 30 to 60 years is estimated to be 40 to 60% (midpoint 50%), based on (c) and (e) above.

Past reduction is based on significant habitat loss to agriculture, particularly the impact of diversion of floodwaters for agriculture including irrigation, as well as for town water supply. This includes sites connected to the floodplain system of the Murray River and its lower tributaries, to the northern outfall of the Wimmera River in the vicinity of Lake Albacutya and Outlet Creek where last collected by Beaglehole in 1976, and the Richardson River where last collected near Donald in 1958.

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 30 to 60 years is projected to be 30 to 50%, based on (c) and (e) above.

Future reduction is based on the projected impact of the identified current and future threats, such as incremental habitat loss and degradation, herbivory, and weed invasion.

Eligible under Criterion A4 as Endangered

The population reduction over any 30 to 60 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.

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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 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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 52 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 naturally at the regional and landscape scales and anthropogenically at the landscape scale. 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, although seed or pods may be dispersed locally by floodwaters.

It is estimated to have a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the current and projected impact of the identified threats, and extreme fluctuations in (iv) above based on significant fluctuations in recruitment success following the last flood or rainfall event.

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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 total population size for the taxon since there is no population monitoring data for the taxon in Victoria. However, any such estimate of population size is likely to be an artefact of recruitment success following the last flood or rainfall event.

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

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