Threatened Species Assessment

Frankenia serpyllifolia
Bristly Sea-heath

Taxonomy

Frankenia serpyllifolia Lindl.

Current conservation status

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

Proposed conservation status

Vulnerable in Victoria

Criterion A2abce

Species Information

Description and Life History

The taxon is a low, densely branched sprawling to erect shrub; branches sparsely to densely covered in spreading to uncinate hairs c. 0.1–0.5 or more (longer on plants with glabrous leaves), or rarely glabrous; internodes 5–32 mm long. Leaves on long-shoot 3–13 mm long; petiole 0.4–2.7 mm long, tapered distally where 0.3–0.8(–1.2) mm wide, ciliate; leaf-blade elliptic, oblong, obovate or ovate, 1–8 mm wide, coriaceous; flat or with margins loosely to tightly revolute; midrib inconspicuous or prominent, linear to flat; surfaces greyish yellow-green, glabrous to densely covered in spreading to uncinate hairs; short-shoot leaves similar. Flowers 1–19 in terminal or axillary dichasia, or solitary. Calyx 5-lobed, 4–10 mm long, 1–2 mm wide, glabrous to densely hairy; petals (4–)5, 6–15 mm long; stamens 6; style-branches 2 or 3; ovules usually 2 or 3. Flowers most of year (VicFlora 2019).

F. serpyllifolia appears to be a short-lived to moderately long-lived shrub. It is occasionally killed *en masse* as a result of localized flooding of its raak/saltmarsh habitats. It is able to regenerate from seed in most years, especially those with good winter rains. It does not sucker or otherwise asexually reproduce.

Generation Length

The generation length of *Frankenia serpyllifolia* is suspected to be 15 to 25 years. Most *Frankenia* spp. have longevities in the 10-20-40 year range, but this taxon is more likely to be 5 -10, as it is less tolerant of drought. Seedling recruitment is rarely observed and it is rarely observed to sucker, although Aeolian deposition raises the soil level under the intricate shrub giving the impression of suckering. Recruitment is pulsed by good rainfall, particularly summer rain, but is unpredictable, erratic, and stochastic.

Distribution

The taxon is scattered in Victoria from the margins of salt lakes in the far north-west, to isolated localities in the south, including the margins of saline lakes on the basalt plains. Elsewhere in Australia, it occurs in similar habitats throughout the arid and semi-arid temperate climates.

Habitat

The taxon's habitat is the margins of saline evaporative basins, along with *Tecticornia* spp. and other halophytes. These habitats are often also gypseous, but this is one of the least gypsum-tolerant *Frankenia* taxa. These habitats are very taxa-poor, especially of perennials, with much open space between shrubs, and mineral salt is a feature of

the surface soils. Furthermore, *F. serpyllifolia* occurs in relatively lower salinity sites than other *Frankenia* spp. and its sites are occasionally subject to relatively low salinity ground water inflows.

Threats

Rising saline ground water tables are a major threat, as it is not known how widely and how quickly the taxon may disperse into newly salinized landscapes. Otherwise its habitat is largely avoided by rabbits and kangaroos, although it can be impacted by domestic stock, notably goats. Altered drainage, such as by the use of boinkas for saline water discharge or overflow from adjoining irrigation, is also a threat.

Historically it may have been affected by sheep grazing. The major settlement of the Mallee took place mostly prior to the 1920s, although grazing runs were taken up in the 1860s, with grazing pressure from sheep often very high.

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 Vulnerable

The population reduction over the past 45 to 75 years is suspected to be 20 to 50% (midpoint 30%), based on (a), (b), (c) and (e) above.

Past decline is based on impacts of threats pre-1956, when myxomatosis spread and reduced the former abundant rabbit populations.

The causes of the 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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range, based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA), is estimated to be 24,790 km² which exceeds the threshold for criterion B.

The Area of Occupancy (AoO) across the taxon's range, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA, is estimated to be 158 km² but other thresholds under this criterion have not been met.

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 suspected that there are 1,500 to 25,000 (midpoint 5,000) mature individuals, but the qualifier is too weak, and other thresholds under this criterion have not been met.

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:

Ineligible under Criterion D

It is suspected that there are 1,500 to 25,000 (midpoint 5,000) mature individuals, which exceeds the threshold for criterion D.

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

References

ALA online (2019). Atlas of Living Australia Online: *Frankenia serpyllifolia.* Retrieved from: https://bie.ala.org.au/species/http://id.biodiversity.org.au/node/apni/2919339

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Kutsche F. and Lay B. (2003). *Field Guide to the Plants of Outback South Australia*. Department of Water, Land and Biodiversity Conservation, South Australia

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Frankenia serpyllifolia.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/3f2f90b3-003f-4791-b2fb-a147a47198c9