Threatened Species Assessment

Prostanthera spinosa
Spiny Mint-bush

Taxonomy

Prostanthera spinosa F. Muell.

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 A3c; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a spreading to erect shrub 0.2–2 m high, aromatic; branches with sparse to moderately dense antrorse to spreading-antrorse hairs, usually over a layer of much shorter antrorse hairs, rarely subglabrous except at nodes, sparsely glandular, with regular decussate spines 6–16 mm long. Leaves narrowly ovate to elliptic or trullate, 1.5–6(–8) mm long, 1–3(–4) mm wide, light to dark green, paler below, glabrous or with a few stiff spreading hairs on midrib below, rarely moderately densely hispid, copiously covered with subsessile glands below, base acute to subobtuse, margin entire, sometimes slightly recurved, apex obtuse; petiole 0.4–1 mm long. Flowers appearing axillary; bracteoles persistent, 0.9–2 mm long, 0.2–0.3 mm wide. Calyx 3.5–5 mm long, tube 2–3 mm long, adaxial lobe 1.5–2(–2.5) mm long (not enlarged in fruit); corolla pale mauve or pale lilac to white, orange-brown dotted or streaked in throat on lower lip, 8–14 mm long; anther appendage c. 1–1.5 mm long. Flowers July–December (VicFlora 2017).

P.spinosa is a long-lived shrub and is assumed to resprout after fire. Reproduction is only by seed, and the breeding system is unknown but assumed to be predominantly outcrossing. It is pollinated by solitary bees for a nectar reward, and whether or not it is pollinated by exotic honeybees is unknown, but likely. Seeds are passively shed and apparently have no secondary dispersal mechanism, and they form a soil-stored seedbank which is probably long-lived. Gene flow at most is likely to be a few scores of metres.

Generation Length

The generation length of *Prostanthera spinosa* is suspected to be 30 to 50 years. This is based on its longevity, assumed resprouting capacity post-fire, and continuous recruitment.

Distribution

The taxon is confined in Victoria to the northern and western Grampians.

Habitat

The taxon is found in heathy woodland on skeletal sandy soils derived from Siluro-Devonian sandstone. The sites are very rocky.

Threats

Threats to the taxon include the effects of climate change such as decreased rainfall, increased evaporation, and extreme temperatures; increased frequency and intensity of fire; elevated fuel loads of invasive plants, especially *Acacia longifolia* s.l., causing the sterilisation of the soil and destruction of seedbank when burnt; extreme rainfall events causing flash floods, soil erosion, and/or severe scouring of riparian environments down to bedrock; soil loss on bare post-fire substrates resulting from severe rainfall events; browsing and damage to plants by deer, especially Sambar Deer (*Rusa unicolor*); weed invasion, especially *A. longifolia* s.l.; failure to manage invasive taxa; browsing by goats; and Cinnamon Root-rot Fungus.

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 A3 as Endangered

The population reduction over the next 90 to 100 years is projected to be 30 to 50%, based on (c) above.

Future reduction is based on the projected impacts of the identified threats, particularly climate change and weed invasion, especially of *A. longifolia* s.l.

Eligible under Criterion A4 as Vulnerable

The population reduction over any 90 to 150-year period, including both past and future (up to 100 years in the future), is inferred to be 20 to 40%, based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

Past decline has been caused primarily by weed invasions.

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 B1 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 378 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is observed to be severely fragmented considering its limited dispersal ability, the barriers to dispersal, and the lack of habitat separating individuals.

It is projected to have 4 locations, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above due to the identified threats, particularly climate change and weed invasion.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 64 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 4 locations, 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:

Ineligible under Criterion C as Data Deficient

No reliable estimate of the total population size for the taxon is available.

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 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.

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VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Vicotria: *Prostanthera spinosa.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/6f1ea91f-87d0-445b-b0eb-d079da50f8dd