Threatened Species Assessment

Comesperma scoparium
Broom Milkwort

Taxonomy

Comesperma scoparium J. Drumm.

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criterion B2ab(i,ii,iii,v)

Species Information

Description and Life History

Rigid, erect shrub to c. 80 cm high; stems grooved, minutely tuberculate, microscopically pubescent within grooves, otherwise glabrous. Leaves reduced to closely appressed, narrow-triangular scales c. 1–2 mm long. Flowers blue, sessile and solitary along upper parts of branches; sepals free, the outer 3 ovate, c. 2.5 mm long, wings broadly obovate, c. 5 mm long, keel pouched and pleated from near midway, c. 4 mm long; upper petals narrow-obovate, shortly exceeding keel and united with it to c. midway, yellowish. Capsule obovate, 5.5–6.5 mm long; seeds flattened-ellipsoid, c. 3 mm long, pubescent, with a linear, membranous basal appendage c. 2 mm long. Flowers August–October (VicFlora 2014).

C. scoparium is perennial but is relatively short-lived (3-8 years). Its germination and establishment are enabled by fire, and are largely absent in unburnt locations. Rapid growth leads to maximal flowering and seed set by the 2nd year, and then gradual decline and disappearance as the taxon retreats to the soil seed store. It is restricted to deep, siliceous sands in strongly Mediterranean climates and never occurs in large populations, but rather as scattered individuals. *C. scoparium* does not sucker.

Generation Length

The generation length of *Comesperma scoparium* is suspected to be 20 to 40 years. This is a fire ephemeral, existing solely in the soil seed store for much of each generation, hence its generation length is dependent on the time between fires and that varies greatly, dependent on location and current planned fire strategy. In the Big Desert, the natural fire frequency before the current régime of planned burning was about 1 major fire every 20-22 years. On the Lowan Dunes of the Sunset Country the corresponding fire frequency was less, maybe every 30-40 years. The current frequency of planned burns may be much higher, particularly adjacent to tracks or in sites close to the agricultural landscape.

Distribution

In Victoria, the taxon is restricted to the Mallee region, from the central Big Desert to Annuello and the southern Sunset Country, but always on deep siliceous sands. The Victorian occurrence is likely to be in contact with populations in SA, particularly in the 90-Mile Desert.

Habitat

The taxon occurs solely on deep siliceous sands in the semi-arid Mediterranean climate zone, often in sandplain heathland but also in Lowan Sands Mallee, usually on or near dune tops.

Threats

The taxon is susceptible to browsing by goats, but this is not common in its habitat. The habitat is increasingly subject to frequent planned burns, but the taxon is likely able to tolerate, and even may benefit from, frequent burns. H. Browne (pers. comm.) noted that most plants were protected by *Triodia* tussocks from browsing by kangaroos, but it is susceptible also to rabbits and stock. It is likely to be a post-fire pioneer, has light wind-dispersed seed which are unlikely to be soil stored and may be reliant on a nearby seed source post-fire. Its rarity may be partly due to its dependence on certain fire histories and to grazing by rabbits, stock, and other mammals.

Anthropogenic fire regimes may initially induce more frequent recruitment, but climatic drying and potentially warming are likely to expose existing stands to conditions which currently limit it to a narrow latitudinal range in SA and Victoria. Southward migration of arid climates poses a serious threat.

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:

Ineligible under Criterion A

The population reduction for this taxon is below the threshold for eligibility under criterion A.

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 Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 9,109 km^2, based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is inferred to be severely fragmented, based on inferred short-range dispersal by wind.

It is suspected to have 1 location, and has a continuing decline in (i), (ii), (iii) and (v) above, based on reported vulnerability to either increased fire frequency, prolonged absence of fire, increased browsing pressure from both native and exotic herbivores, and on climatic drying "squeezing" the taxon between the arid zone and heavy soils plains.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 95 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) 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

It is suspected that there are 3,000 to 8,000 mature individuals, but this 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 3,000 to 8,000 mature individuals, but this qualifier is too weak and the numbers exceed the thresholds for criterion D.

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

References

ALA online. Atlas of Living Australia. Retrieved from https://bie.ala.org.au/species/http://id.biodiversity.org.au/node/apni/7788995

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne.

VicFlora (2014). Flora of Victoria, Royal Botanic Gardens Victoria: *Comesperma scoparium*. Retrieved from https://vicflora.rbg.vic.gov.au/flora/taxon/958f7d36-0c7d-41bb-8a02-aef027105180