Threatened Species Assessment

Pimelea simplex subsp. *simplex*
Desert Rice-flower

Taxonomy

Pimelea simplex subsp. *simplex* F. Muell.

One of two subspecies, one in Victoria.

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

Species Information

Description and Life History

The taxon is an herbaceous or semi-woody annual, 5–50 cm high; young stems hairy. Leaves alternate, shortly petiolate, narrowly elliptic to linear, 5–15 mm long, 1–2 mm wide, concolorous, mid green to dark bluish-green, usually sparsely covered in antrorse hairs. Inflorescence terminal, dense, compact or elongate at maturity, to 11 mm long, many-flowered; involucral bracts absent or not differentiated from leaves. Flowers bisexual, white to yellowish-green (sometimes with purplish sepals), densely hairy outside, glabrous inside; floral tube 2–5 mm long, style-portion poorly defined, circumscissile above ovary; sepals erect, 0.4–1 mm long; pedicel hairy; stamens inserted below sepals, almost sessile in throat; anthers opening somewhat laterally to more or less towards the centre of the flower; style not or little exserted. Fruit dry, enclosed. Flowers September–November (VicFlora 2018).

Recruitment is from a soil-stored seedbank, of unknown but probably considerable longevity. Germination of seeds is probably opportunistic according to rain events, but is most likely to be in autumn following good rains. Its breeding system is unknown but is likely to be self-fertile if not self-pollinating. It is pollinated (when this applies) by insects, but pollination is otherwise undocumented. Seeds and fruits are passively dispersed when shed from plants, but are otherwise wind-dispersed, aided by its fluffy dispersal unit (seed, fruit hypantheum). The impact of fire is unknown but is liable to be a stimulus to germination.

Generation Length

The generation length of *Pimelea simplex* subsp. *simplex* is estimated to be 1 year. This is based on the taxon being an annual herb.

Distribution

P.simplex subsp. *simplex* occurs in north-west Victoria, from the Pink Lakes to the Hattah area.

Habitat

VicFlora (2018) states that the taxon is common only on slight rises in saline gypsum around the Pink Lakes. However, Cunningham et. al. (1992) states that the habitat of *P. simplex* is variable, is most common in open areas subject to infrequent flooding, on most soil types, and in a wide variety of vegetation types.

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 fires, soil loss on bare post-fire substrates resulting from severe rainfall events, damage to plants and soils by off-road recreational vehicles, weed invasion, and grazing and soil disturbance by rabbits and perhaps other feral mammals (e.g. goats).

Everest (1981) documents stock losses to the toxic *P. simplex*, however this does not mean that feral animals do not graze or browse the taxon.

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 past population reduction does not meet the threshold for eligibility under criterion A2, and the future population reduction does not meet the threshold for eligibility under criterion A3.

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 2,345 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

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

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the impacts of the identified threats, particularly climate change.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 56 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon is severely fragmented, 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

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