



Maireana cheelii Chariot Wheels

Taxonomy

Maireana cheelii (R.H. Anderson) Paul G. Wilson

Current conservation status

Listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*.

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2007).

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

Proposed conservation status

Endangered in Victoria

Criteria A2abce+3bce

Species Information

Description and Life History

The taxon is a tufted perennial with erect slender, woolly branches to c. 20 cm long arising from a swollen taproot. Leaves alternate, linear, 5–9 mm long, somewhat fleshy, plano-convex in section, mostly shortly spurred at base. Flowers bisexual. Fruiting perianth 5–6 mm diam., cottony above, flat or depressed at apex; tube c. 2 mm diam., woody and prominently 10-ribbed below wings with a knob-like base; wings 5, spreading, fan-shaped, cartilaginous; radicular slit with a thickened margin, extending to base of tube. Fruits mostly September–November (VicFlora 2019).

Generation Length

The generation length of *Maireana cheelii* is estimated to be 20 to 50 years. Plants are likely to have a half-life of at least 10–15 years, and maybe longer. Successful recruitment has been observed following summer rains which stimulate seeding over summer and then recruitment in autumn. Seeding in spring tends to result in minimal recruitment as the majority of seed is predated by ants. Given the likelihood of these events occurring, and the long lived nature of this taxon, it is likely the generation length is at least 20 years and potentially greater than 50 years.

Distribution

The taxon is very rare in Victoria, where it is known only from the Kamarooka area (but not collected there since 1947), Lake Buloke near Donald, and near Kerang. It is found in Victorian Riverina and Wimmera bioregions, and is also found in Queensland and New South Wales (VicFlora 2019).

Habitat

The taxon occurs on seasonally wet heavy red loam or clay soils (VicFlora 2019).

Threats

Key threats to the taxon are cultivation and grazing by domestic stock. Cultivation is more likely to remove remnant populations in the short term. Grazing by domestic stock is likely to impact on recruitment, and is likely to result in the continued decline of this taxon through reductions in the fitness of populations.

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 style="text-align: center;"><i>based on any of the following:</i></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 60 to 150 years is inferred to be 50 to 90% (midpoint 70%), based on (a), (b), (c) and (e) above.

Past reduction is consistent with the loss of the extent of the ecological community within which the taxon exists. This is likely an under estimate of loss given it does not take into account decline in the integrity of the ecological community.

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 60 to 100 years is projected to be 60 to 90% (midpoint, 75%) based on (b), (c) and (e) above.

It is assumed a decline of 50% will occur with each generation length under the continuation of current management, which is expected to dramatically reduce recruitment success largely because of the timing and intensity of disturbance by grazing.

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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 9,482 km² and the Area of Occupancy (AoO) is estimated to be 228 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 <u>C1</u> or <u>C2</u>				
<u>C1</u>	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)
<u>C2</u>	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 estimated that there are 100,000 to 500,000 mature individuals, which exceeds the thresholds for criterion C.

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 km ² or number of locations ≤ 5

Evidence:

Ineligible under Criterion D

It is estimated that there are 100,000 to 500,000 mature individuals, which exceeds the thresholds for criterion D.

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

References

DEH (2000). Species Profile and Threats (SPRAT) database: *Maireana cheelii*. Department of the Environment and Heritage, Canberra. Retrieved from: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=8008

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne. Retrieved from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf

SAC (2007). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 790 *Maireana cheelii*

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Maireana cheelii*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/8c2a94cf-875c-4b96-b99f-1a7e4db5633f>

Walsh, N.G. and Entwisle, T.J. (1996), *Flora of Victoria Vol. 3, Dicotyledons Winteraceae to Myrtaceae*. Inkata Press, Melbourne.