Threatened Species Assessment

Grevillea monslacana
Lake Mountain Grevillea

Taxonomy

Grevillea monslacana Molyneux & Stajsic

The taxon was originally classified as a form of *Grevillea victoriae* (Stajsic and Molyneux 2005).

Current conservation status

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

Proposed conservation status

Critically Endangered in Australia

Criterion B1ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The taxon is a spreading to erect shrub (1-)1.5-3.5 m high, 1.5-3 wide. Branchlets densely tomentose. Leaves entire, narrowly obovate or occasionally narrowly elliptic (20-)30-70(-120) mm long, (4-)8-15(-25) mm wide; upper surface glabrous, or with appressed silvery hairs just above petiole, variably dull or glossy; margins distinctly recurved; lower surface sericeous, lateral veins obscure to evident, reticulum absent. Conflorescences usually terminal, decurved to pendulous, simple to 4-branched. Primary peduncles (0-)4-10(-25) mm long, indumentum tomentose; floral rachises (10-)15-30 mm long. Very early flower buds with the perianth below the limb wholly apricot-coloured or light ferruginous, the limb same colour or brownish grey. Limb of flower buds subglobose inside view, apex obtuse. Limb-segments of tepals (mature pre-anthesis flowers) not keeled or obscurely keeled along external midline. Dorsal tepals 15-22 mm long, 1.9-2.5 mm wide. Perianth outer surface (below limb) ferruginous or tan-coloured, epidermis clearly visible, loosely subsericeous; inner surface densely bearded near base; perianth inner surface pinkish-white or whitish. Pistil (16-)18-20(-23) mm long, ovary stipitate, glabrous, style pink, reddish-pink or rarely whitish; face of pollen strongly oblique to style, convex. Fruits glabrous. Flowering has been recorded primarily Aug.-Jan., but in the absence of snow can occur sporadically throughout the year (VicFlora 2017).

Nectarivorous birds, especially honeyeaters, visit the flowers, and it is assumed that birds are the primary pollinators (Stajsic and Molyneux 2005).

Generation Length

The generation length of *Grevillea monslacana* is inferred to be 30 to 50 years. The Vital Attribute database does not contain data for *G. monslacana*, however it is assumed that its attributes are similar to that of *G. miqueliana*, which is also part of the *G. victoriae* complex. This is considered an obligate seeder that requires 10 years to reach viable reproductive age, is intolerant of establishment in mature vegetation, lives for 10-50 years, and has seeds that survive 50+ years in the soil.

Fire is historically rare in the alpine region, occurring perhaps once or twice per century. After pulse recruitment, most populations in undisturbed vegetation would grow to senescence. The average age of mature plants is therefore likely to be at the older end of the range, perhaps around 40 years.

Distribution

The taxon is endemic to Victoria, occurring in a geographically restricted area to the north and northeast of Marysville, in the Mt Margaret and Lake Mountain region (VicFlora 2017). It is the most-westerly occurring member of the *G. victoriae* complex, and occurs in scattered populations (Stajsic and Molyneux 2005).

Habitat

The taxon occurs in montane wet sclerophyll forest and subalpine open woodland, between 1,100 and 1,400 metres above sea level (VicFlora 2017). It is commonly found along roadsides as well as extending into bushland, on soils of granitic derivation (Stajsic and Molyneux 2005).

Threats

There are no records of vegetative reproduction by the taxon, and plants are killed outright by fire. Therefore regular fire, including cool burns, could threaten long-term survival of populations if they can't reach a flowering and seeding age (Stajsic and Molyneux 2005).

High numbers of deer in the taxon's primary habitat is also of concern, as is the potential for damage from future infrastructure works given the proximity of some populations to the Lake Mountain car park.

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 90 to 150 years is estimated to be 20 to 40%, based on (c) and (e) above.

Past decline is based on the proximity of the taxon to the Lake Mountain infrastructure, as populations are highly likely to have been lost as a result of construction of roads, carparks and buildings. Deer have increased substantially around the Yarra Ranges National Park, and with early cattle grazing (up to 1963) this may also have reduced numbers.

The causes of reduction may not have ceased, be understood or be reversible.

Eligible under Criterion A3 as Vulnerable

The population reduction over the next 90 to 100 years is projected to be 20 to 40%, based on (c) and (e) above.

Future decline is based on the climate getting warmer and drier, and fires are becoming more frequent, as well as the increase in deer around the Yarra Ranges NP. There is also the potential for future infrastructure works at the resort, hence populations are likely to continue to decrease.

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 Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 66 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA)

The taxon is estimated to be severely fragmented as groups of plants are small, are separated by gaps in suitable habitat, and are potentially subject to stochastic disturbance. Outlying records could be lost with little or no chance of recolonization, further increasing the likelihood of extinction.

It is inferred to have one location, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the impacts of the identified threats.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 36 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), (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:

Eligible under Criterion C1 as Endangered

It is estimated that there are 2,000 to 4,000 mature individuals. The number of mature plants varies considerably with respect to time since fire. Most records in the VBA are from 40-50 years post-fire and have a Braun-Blanquet cover class of '+' (<1% cover), which suggests that plants exist as scattered individuals. However, Tolsma et al (2011) found post-fire populations of 200 to 1000 plants, reflecting profuse post-fire recruitment, although such numbers will reduce to background levels again as the vegetation matures. Assuming that abundance is low in undisturbed vegetation, and that each of the 43 VBA records is associated with 50 plants, then the number of mature plants is likely to be around 2000, albeit with considerable uncertainty.

There is projected to be a continuing decline of 10 to 40% within two generations.

Eligible under Criterion C2 as Endangered

It is estimated that there are 2,000 to 4,000 mature individuals. The number of mature individuals is projected to continue to decline, and 95-100% of mature individuals occur within one subpopulation.

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 D 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. 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

Stajsic, V. and Molyneux, W.M. (2005). Taxonomic studies in the *Grevillea victoriae* F.Muell. species complex (Proteaceae: Grevilleoideae) I. Descriptions of nine previously segregated, and three new taxa. *Muelleria* 22: 22-76.

Tolsma A., Sutter G. and Coates F. (2011). *Recovery of Victorian Rare or Threatened Plant Species After the 2009 Bushfires*. In: Black Saturday, Victoria 2009 - Natural Values Fire Recovery Program. Report to the Department of Sustainability and Environment.

VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Grevillea monslacana*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/4bb73698-4e4d-4aa0-989b-0fe22644d725