Threatened Species Assessment

Grevillea alpivaga
Buffalo Grevillea

Taxonomy

Grevillea alpivaga Gand.

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(ii,iii,v)

Species Information

Description and Life History

The taxon is a shrub 0.7–1 m high. Leaves entire, linear, very crowded, often slightly curved, 0.8–2.5(–3) cm long, 0.9–1.4 mm wide; upper surface often minutely scabrous or granular along veins; margin usually vertically refracted downwards from the plane of the (usually flat, occasionally slightly convex) upper surface (leaf usually oblong in cross section); lower surface silky (usually some lamina showing beside midvein). Conflorescences c. 1 cm long, sessile, regular, umbel-like; perianth pale green to cream (brown hairs at apex), outer surface with appressed hairs, inner surface with a scanty beard opposite the ovary especially on ventral tepals; pistil 6.5–7 mm long; ovary stipitate, glabrous, style white (to pink?) reddening after anthesis, with minute hairs or papillae just below apex, pollen presenter oblique. Fruits glabrous. Flowers recorded October–February (VicFlora 2017).

The taxon's fire response is unknown. It is insect pollinated, but its breeding system unknown, and a soil-stored seedbank of unknown longevity develops. Gene-flow is probably short distance only via the insect pollinators and low dispersal capacity of the seeds, which are assumed to be passively dispersed only.

Generation Length

The generation length of *Grevillea alpivaga* is suspected to be 30 to 50 years. This is based on the general longevity of *Grevillea* (N. Marriott pers. comm.).

Distribution

The taxon is endemic on the Mt Buffalo Plateau, and towards Porepunkah (VicFlora 2017).

Habitat

G. alpivaga occurs mostly on granitic geology, on sedimentary geology, as well as the contact zone between geologies. It occupies well-drained substrates in eucalypt woodland upwards of 900m above sea level, and occurs on drainage lines.

Threats

The taxon is threatened by the effects of climate change, including decreased rainfall, decreased snowfall, increased evaporation, and extreme temperatures. It is also threatened by the increased frequency, intensity and inappropriate timing of fire as well as fire control activities, soil erosion and loss such as sheet, gullying or wind

erosion, weed invasion, exotic and native taxa browsing, *Grevillea* Leaf Skeletonisers, nectar-robbing by introduced honeybees, pathogens such as Cinnamon Root-rot Fungus, ecological disturbance/dysfunction, reduced seed dispersal, and changes in vector populations and ecological processes.

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

There is insufficient evidence to determine whether there has been or will be a reduction in population sufficient to meet any threshold for 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 Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 36 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA). The EoO has been made equal to the Area of Occupancy (AoO) to ensure consistency with the definition of AoO as an area within EoO.

The taxon is inferred to be severely fragmented naturally at the landscape scale. It has a patchy distribution with most occurrences isolated from other occurrences at separations exceeding the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal.

It is inferred to have 1 location, and has a continuing decline in (ii), (iii) and (v) above due to weed invasion, climate change and fire regimes.

Eligible under Criterion B2 as Endangered

The AoO across the taxon's range is estimated to be 36 km^2, 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 (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 estimated that there are 1,000 to 2,000 mature individuals, but 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 estimated that there are 1,000 to 2,000 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

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

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VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Grevillea alpivaga*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/869b02db-3203-405f-b360-344d546bbbae