Threatened Species Assessment

Logania granitica
Mountain Logania

Taxonomy

Logania granitica A.J. Whalen & B.J. Conn

This is genetically and morphologically similar to the morphologically variable *Logania albiflora* and possibly just a form of this species (VicFlora 2018).

Current conservation status

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

Proposed conservation status

Vulnerable in Victoria

Criteria D1+2

Species Information

Description and Life History

The taxon is a spreading dioecious shrub to 1.5 m high; branches quadrangular, minutely and densely hairy between ridges. Leaves sessile, linear, 7-30 mm long, 1-6 mm wide, lower surface densely papillate, base decurrent, margin strongly recurved, apex obtuse to acute. Inflorescence less than 10 mm long, usually (1-)3-9-flowered, sometimes branched; flowers unisexual. Calyx c. 1 mm long, lobes ovate; corolla c. 2 mm long, tube c. 1 mm long, c. equal to lobes, lobes broad-ovate, rounded, outer surface glabrous, inner surface minutely papillate. Stamens inserted c. halfway up corolla-tube. The taxon flowers from September to November (VicFlora 2018).

Generation Length

The generation length of *Logania granitica* is estimated to be 35 to 50 years. This is based on a plausible longevity of 15-20 years or more and likely episodic recruitment from a long-persistent, soil-stored, seed bank. The taxon is observed to recruit post-fire (Whalen and Conn, 2007), with most fires of patchy incidence and highly variable intensity on account of the rocky habitat and low fuel accumulation rates. Pre-European settlement intervals are estimated to be 35-80 years. The taxon is likely to be a fire-sensitive, obligate, seed regenerator (OSR) since there is no indication that the taxon suckers from its root system or resprouts from the rootstock. Although the taxon is likely to recruit primarily post-fire, it may also recruit sporadically and opportunistically in response to favourable seasonal conditions and localised disturbance events.

Whalen and Conn (2007) record that '*Logania granitica* is a pioneer species, preferring open sites and responding vigorously to disturbance. In particular, seedlings of this species were found in abundance in the Namadgi National Park after the devastating 2003 bushfires.'

Distribution

The taxon is known in Victoria from the summit of Mt Tingaringy, on Mount Buffalo and at The Watchtower (Neilson Crag) in the Snowy Range. The taxon also occurs in New South Wales and the Australian Capital Territory (VicFlora 2018).

Although *Logania granitica* is distributed over a large area, it is only found on occasional sub-alpine mountain tops within this range (Whalen and Conn, 2007).

Re-examination of specimens previously determined by Neville Walsh as *Logania* sp. 1 sensu (Flora of Victoria 4:304 1999) from the Genoa River Gorge and a specimen tentatively assigned to *L*. sp. 1 taken 4 km south-west of Buldah suggests these specimens are best treated as *L. albiflora*.

Habitat

The taxon is known in Victoria from heathlands, shrublands and subalpine woodlands amongst granite rocks or on soils derived from granite near mountain summits (VicFlora 2018). It grows in heathland communities, in *Kunzea ericoides-K. muelleri* (Burgan-Yellow Kunzea) dominated shrublands or in subalpine eucalypt woodlands (dominated by *Eucalypus pauciflora* subsp. *pauciflora* (Snow Gum), *E. stellulata* (Black Sallee) or *E. pauciflora* subsp. *niphophila* (Alpine Sallee). It grows on rocky slopes or exposed hilltops in skeletal soils derived from a granitic substrate. This taxon occurs at high elevations (1200-1450 m) (Whalen and Conn, 2007).

At Mt Tingaringy, the taxon occurs amongst rocks on an exposed, more or less treeless summit area in a low shrubland dominated by *Phebalium squamulosum* (Forest Phebalium), *Prostanthera phylicifolia* (Spiked Mint-bush), *Podolobium alpestre* (Alpine Podolobium), *Boronia anemonifolia* (Sticky Boronia), *Eucalyptus glaucescens* (Tingaringy Gum), *Grevillea brevifolia* (Cobberas Grevillea), *Hybanthus monopetalus* (Slender Violet-bush), *Leptospermum brevipes* (Slender Tea-tree) and *L. micromyrtus* (Button Tea-tree).

Threats

Current and future threats are difficult to identify with any confidence but may include targeted browsing by native and exotic herbivores, adult mortality and recruitment failure in response to extreme drought stress and, potentially, the impact of increasing frequency, intensity, scale and local penetration of fire.

Historic decline through habitat loss is likely to have been negligible since all known occurrences occupy elevated rocky spurs, ridgelines or mountain summits of no agricultural or silvicultural value. The only direct impact of settlement activity is the frequent construction of road or track access to summits for a variety of purposes including the maintenance of fire towers, trig points, telecommunication facilities, lines of sight, helipads for fire control and visitor access to 360-degree panoramic views. For all these purposes, targeted vegetation clearance has resulted in localised habitat loss and degradation. Although the footprint of these activities is typically limited, it frequently coincides with the precise habitat of the taxon. In some instances, the disturbance associated with these localised activities may promote recruitment as well as destroy established adults. Disturbance has occurred at Mt Tingaringy although it is unclear whether it has directly affected the *Logania granitica* stand at the site.

The increasing population density and penetration of all habitats throughout the Victorian range of the taxon by Sambar Deer (*Rusa unicolor*) poses an increasing risk, since Sambar have demonstrated their capacity to target a wide range of plant taxa, with the greatest effects likely to be during extended droughts and during the early, vulnerable stages of seedling recruitment.

Recent observation of drought-induced mortality of *Eucalyptus albens* (White Box) and other highly drought-tolerant plant taxa in elevated skeletal habitats comparable to those occupied by *Logania granitica* suggest that extreme drought events may also pose a serious long-term risk to *L. granitica* of both adult mortality and recruitment failure.

The current and long-term threat posed by increasing fire risk is difficult to quantify since the increasing frequency of fire may result in reduced fuel accumulation and hence fire intensity at the time of any recurrent fire. The risk of repeat fire at intervals approaching the tolerable fire interval for the taxon is therefore difficult to assess.

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. There is insufficient evidence to determine whether will be a future reduction in population size (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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 6,800 km² and the Area of Occupancy (AoO) is estimated to be 12 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 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

The taxon is estimated to have 300 to 1,000 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:

Eligible under Criterion D as Vulnerable

The taxon is estimated to have 300 to 1,000 mature individuals, based on field observations at Mt Tingaringy and the Watchtower, and collectors' comments, suggesting the taxon is represented by small and highly localised stands.

Eligible under Criterion D2 as Vulnerable

The taxon is estimated to be very restricted. It has a restricted distribution, with a single location, such that this restriction makes the taxon capable of becoming CR or EX within a tie frame of one or two generations in response to the impact of the identified threats.

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.

VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Logania granitica.* Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/af779751-47b5-4287-8211-9b46d451d6cb

Whalen, A.J. and Conn, B.J. (2007). Status of *Logania falcata* and *L*. sp. aff. *albiflora* (Loganiaceae). *Telopea* 11 (4), 393-397.