# Threatened Species Assessment

## *Logania pusilla*
## Tiny Logania

### Taxonomy

*Logania pusilla* R. Br.

### Current conservation status

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

### Proposed conservation status

Vulnerable in Victoria

Criterion D2

### Species Information

#### Description and Life History

The taxon is a dioecious herb or weak procumbent undershrub to c. 15 cm high; branches with two lateral longitudinal ridges. Leaves with petiole 1-3 mm long; lamina narrow-elliptic to narrow-obovate, or oblong, 6-12 mm long, 3-6 mm wide, lower surface smooth, not papillate, base cuneate to attenuate, somewhat decurrent, margin slightly revolute, apex obtuse to acute. Inflorescence 1-flowered; flowers unisexual. Calyx 3-5 mm long, lobes narrow-ovate; corolla 4-8 mm long, tube 3-4.8 mm long, longer than lobes, lobes ovate to elliptic, obtuse, outer surface glabrous, inner surface sparsely hairy in tube and on basal half of lobes, hairs thick and crinkled; stamens inserted in throat of corolla-tube. Capsules 5-9 mm long. The taxon flowers in Spring (VicFlora 2017).

#### Generation Length

The generation length of *Logania pusilla* is estimated to be 15 to 25 years. This is difficult to estimate with any confidence since the biology of the taxon is poorly understood. Plants appear to have a taproot with no clear evidence of rhizome development or stoloniferous spread. Root suckering or resprouting from the rootstock following fire is therefore unlikely. The taxon is likely to be a fire-sensitive, obligate, seed regenerator, recruiting episodically following fire events, supplemented by trickle recruitment in favourable seasons in response to localised gap creation in dense heathland vegetation or localised soil disturbance in open forests.

At the time of European settlement, coastal heathlands are likely to have been burnt by intense fire at intervals of 15-45 years or more, depending on the ignition source. Aboriginal fire would have augmented lightning strikes in heavily utilised habitats such as the shores of inlets, estuaries and streams. Fire intensity and frequency in Lowland Forest is likely to have been lower and patchier in comparison. Longevity is plausibly only 10-25 years with recruitment from a long-persistent, soil-stored seedbank.

#### Distribution

The taxon is confined in Victoria to the Mallacoota district in far East Gippsland. The taxon also occurs in Queensland and New South Wales (VicFlora 2017).

#### Habitat

The taxon is confined in Victoria to heathland and heathy lowland forests (VicFlora 2017). It is commonly associated with dense coastal and lowland heathlands dominated by *Allocasuarina paludosa* (Scrub Sheoak). Inland from the coast, the taxon is associated with Lowland Forest dominated by *Angophora floribunda* (Rough-

barked Apple), *Eucalyptus consideniana* (Yertchuk), *E. globoidea* (White Stringybark) and *E. sieberi* (Silvertop Ash).

At one site near Gipsy Point on the Genoa-Mallacoota Road, the taxon is recorded in Banksia Woodland dominated by *Allocasuarina littoralis* (Black Sheoak), *Banksia serrata* (Saw Banksia) and *Eucalyptus globoidea* (White Stringybark) with *Gahnia radula* (Thatch Saw-sedge), *Gonocarpus humilis* (Shade Raspwort), *Kunzea ambigua* (White Kunzea) and *Leptospermum trinervium* (Paperbark Tea-tree) in the understorey. *Tetraria capillaris* (Hair Sedge) is the dominant ground-layer species. At this site, the taxon grows in wettish sites together with *Lindsaea linearis* (Screw Fern) and close to the only Victorian occurrence of *Brunoniella pumilio* (Dwarf Brunoniella).

The very limited available quadrat data and personal observation suggests that populations of the taxon are typically of low density and highly localised.

In New South Wales, the habitat range of the taxon is reported to extend to skeletal soils in rock crevices on large outcrops of granite in dry inland sites.

### Threats

Historic decline through habitat loss is likely to have been limited to a few areas of Lowland Forest between Genoa and Gipsy Point and on the northern outskirts of Mallacoota around Karbethong.

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 and scale of fire in response to climatic drying and warming and the increasing use of planned burning throughout the region.

The cumulative impact of climate change and inappropriate fire regimes is likely to cause a shift in vegetation structure and composition which may increase competition from fire-adapted species at the expense of small understorey plants such as *L. pusilla.* Field observations suggest that the taxon may have a low tolerance of dense sward-forming competitors.

## 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 125 km² and the Area of Occupancy (AoO) is estimated to be 44 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**

There is insufficient evidence to determine the number of mature individuals.

| 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<br>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:<br>AoO < 20 km2 or number of locations ≤ 5 |

## Evidence:

**Eligible under Criterion D2 as Vulnerable**

The taxon is estimated to be very restricted. It has a restricted distribution, occurring in two identified locations, such that this restriction makes the taxon capable of becoming Critically Endangered or even Extinct within a time 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 (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Logania pusilla*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/e201b6b4-d5eb-4736-8b48-969b09ca5677