Threatened Species Assessment

Persoonia brevifolia
Short-leaf Geebung

Taxonomy

Persoonia brevifolia (Benth.) L.A.S. Johnson & P.H. Weston

Current conservation status

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

Proposed conservation status

Critically Endangered in Victoria

Criteria B1ab(iii)+2ab(iii)

Species Information

Description and Life History

The taxon is an erect shrub to c. 1.8 m high; young branches moderately hairy. Leaves alternate, elliptic to broadly elliptic, ovate or obovate, 1-2.4 cm long, 3-12 mm wide, flat, mucronate, slightly to strongly discolorous, smooth, sparsely hairy when young, glabrescent when mature; margins slightly recurved. Flowers solitary in axils of leaves; pedicels 2-5 mm long, erect or recurved, usually glabrous. Tepals 8-12 mm long, caudate, glabrous to sparsely hairy, terminal spine to c. 1 mm long; ovary glabrous. Drupe ovoid, to c. 12 mm long, c. 9 mm wide. Flowers December-March (VicFlora 2017).

Generation Length

The generation length of *Persoonia brevifolia* is estimated to be 50 to 100 years. This is based on the average interval between fires in moist forest in East Gippsland before European settlement.

Distribution

In Victoria the taxon is confined to Yambulla Creek (a tributary of the Genoa River) near the New South Wales border in the far east. It also occurs in New South Wales (VicFlora 2017).

Habitat

The taxon is only known to occur on sandstone terraces.

Threats

Persoonia taxa are likely to require fires at very specific times in order to recruit optimally. The endocarp of *P. brevifolia* is hard and requires some breakdown to allow germination, and this can come through the heat of a fire or by slow wear through water from rainfall over a long period. However, if fire follows periods of high rainfall seeds may become damaged by the heat of a fire because the protective coating of the endocarp has already begun to break down (Emery and Offord 2018). Plants are also killed by fire, so fires should be at an interval seen before European settlement of 50 to 100 years, and then should follow dry periods to allow optimum germination of at least some of the seeds. Fires that are too frequent are likely to kill mature plants before seeds have accumulated. Lack of rainfall, especially following fires when water is most urgently required for growth of seedlings, may also be a threat, and be expected under climatic drying. Added herbivory pressure from introduced mammals such as Sambar Deer (*Rusa unicolor*) provide another threat.

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 5.1 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA). The EoO has been made equal to the AoO to ensure consistency with the definition of AoO as an area within EoO.

The taxon is estimated to have one location as it has probably only been collected from one creek in Victoria where all key identified threats apply and can rapidly affect all individuals of the taxon present.

It has a continuing decline in (iii) above as it is located in a remote area with large expanses of surrounding forest, so it is difficult to manage fire regimes in such areas. As a result, given that this taxon is sensitive to inappropriate fire regimes, and that this threat may continue into the future, the quality of habitat is likely to continue to decline. The other threats of drought following recruitment and herbivory are also expected to persist into the future.

Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 5 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon is estimated to have 1 location and has a continuing decline in (iii) 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 as Data Deficient

There has been no assessment of the number of individuals of *P. brevifolia* in Victoria and so the number of mature individuals is not estimated. The only indication of abundance in Victoria was the description of it being “occasional” on one of the herbarium specimens.

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 D2 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

Emery, N.J. & Offord, C.A. (2018). Managing *Persoonia* (Proteaceae) species in the landscape through better understanding of their seed biology and ecology. *Cunninghamia* 18: 89-107.

VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Melbourne: *Persoonia brevifolia*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/9b20f924-bbfd-4369-8207-277336dd805b