

Pomaderris vacciniifolia Round-leaf Pomaderris

Taxonomy

Pomaderris vacciniifolia Reissek

Current conservation status

Listed as Critically Endangered under the *Environment Protection and Biodiversity Conservation Act 1999*.

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2008).

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

Proposed conservation status

Critically Endangered in Australia

Criteria A3ce+4bce; C1+2a(i)

Species Information

Description and Life History

The taxon is a slender shrub 1-8 m high with elliptic to broad-elliptic leaves 1-2 cm long and up to 1 cm wide. The leaf upper surface is smooth and usually shiny and the lower surface is whitish from a fine dense layer of minute star-shaped hairs. Small creamy-white flowers with tiny petals to 1.5 mm long are arranged in small pyramidal or hemispherical panicles 1-4 cm long and wide.

Generation Length

The generation length of *Pomaderris vacciniifolia* is estimated to be 25 to 70 (likely 35) years. This is based on the observation that most individuals are observed to be mature plants of a cohort inferred to have germinated at the time of the most recent bushfire, that senescent plants in some sites have died without successful seedling recruitment at 30-40 years of age, and that there is no evidence that the taxon is capable of resprouting following intense fire (Cameron 2005, Beardsell 2006 pers. comm., Walsh 2006 pers. comm.). The oldest known individual is inferred to have survived to approximately 70 years of age following recruitment following the 1939 bushfire before dying, with recruitment observed following the 2009 bushfire (Beardsell and Cameron pers. obs.).

Distribution

The taxon is endemic to central Victoria, where it is restricted to middle and upper catchments of the Yarra River, extending marginally north of the divide into the headwaters of the Yea River and King Parrot Creek, tributaries of the Goulburn River, in an area bounded by Healesville, Eltham and Flowerdale, with disjunct occurrences on the northern outskirts of the La Trobe Valley between Tyers and the Toongabbie-Cowwarr district, in the lower catchment of the La Trobe and Thompson Rivers, 100 km to the south-east (Beaughole 1983, 1984, Walsh 2006 pers. comm.). References to the presence of the species in the catchment of the Plenty River and in the Marysville district are not supported by reliable records and are likely to be based on poorly resolved historic records (Cameron 2005).



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Habitat

The taxon occurs in moist forests on ridgelines and lower slopes in hilly foothill country, occasionally extending to drier forest types at lowland sites at the limit of its range, at elevations of 40-550 m above sea level (Cameron 2005, Beardsell 2006 pers. comm.).

Threats

Historically, the greatest threat to the taxon has been habitat loss and decline in habitat quality. The apparent absence of the taxon from extensive tracts of suitable forest habitat throughout its range strongly suggests historic elimination of the taxon from many favourable habitats, as a consequence of the imposition of inappropriate fire and grazing regimes (Beardsell 2006 pers. comm.).

Currently and into the future, Round-leaf Pomaderris is threatened by inappropriate fire regimes, browsing and grazing by feral herbivores, weed invasion, road maintenance operations, and recruitment failure.

Round-leaf Pomaderris is a key fire response plant, adapted to a 15-year fire interval, and is equally threatened by repeated fires at intervals shorter than 10 years and prolonged exclusion of fire for more than 20-25 years. The restriction of a majority of known populations to narrow roadside strips or artificial clearings in heavily forested areas strongly supports the above assertions. These linear stands, however, are transient populations arising from residual soil seed banks and appear destined to vanish from these sites in the absence of successful natural recruitment (Beardsell 2006 pers. comm.).

Reasons for the observed failure to recruit beyond seedling or juvenile growth stages at most sites are likely to include rabbit, deer and wallaby browsing and, in the past, livestock grazing. Rabbit and deer browsing are perhaps the single most important factors limiting the survival of juvenile plants. Browsing by Sambar deer (*Rusa unicolor*) and, to a lesser extent, Red Deer and Fallow Deer, is a major threat at sites in the Kinglake district and at St Andrews and One Tree Hill and, most likely, at all sites in the La Trobe Valley. In general, the taxon demonstrates a very poor ability to recover from browsing attack at all stages of development (Beardsell 2006 pers. comm.). The low branching observed in some populations, such as those in the Paul Range or at Kinglake, is likely to result from browsing by deer (Dabal 2006 pers. comm.). A multi-stemmed or low branching habit does not appear to be a phenotypic or genetically-determined expression of the architecture of the species (Cameron 2005).

Established plants are particularly vulnerable to borer attack of the stem and insect attack of foliage, which results in innumerable white spots visible on the upper surface of the leaf from which the soft tissue has been removed. Mature and senescent plants, in particular, demonstrate a very poor capacity to recover from such attack (Beardsell 2006 pers. comm.).

Rosellas are observed to predate heavily on ripe fruits, contributing to the low fertility of ageing populations (Dabal 2006 pers. comm.). Some populations are threatened by weed invasion, particularly *Rubus fruticosus* spp. agg. Blackberry invasion of sites on lower slopes and *Genista monspessulana* Montpellier Broom or Cape Broom in drier upslope sites (Cameron 2005).

Many roadside populations are threatened by road maintenance works and associated fire management and suppression activities including the construction and regular slashing of fire breaks. Such works conducted within a national park have resulted in the near extinction of the largest documented population of the species at Castella (Beardsell 2006 pers. comm.).

No known population in the Melbourne region can be considered viable in the absence of satisfactory recruitment which, at most sites, is now dependent on management intervention aimed at restoring an ecologically-based fire regime, the control of weeds and the exclusion of native and exotic herbivores. This is demonstrated by the application of fire to the Dodd Street site which resulted in the only documented instance of seedling recruitment and survival in the wild for a lowland population (Beardsell 2006 pers. comm.).

The very small size of all known populations is likely to contribute to the observed low fecundity of many mature plants, some of which never flower or produce viable seed, particularly those under heavy shade of overstorey eucalypts (Beardsell 2006 pers. comm.). This observed infertility is probably due to the genetic isolation of the small relict populations observed in the Melbourne region and may result from inbreeding depression. This only compounds the more direct environmental threats to the viability of all known populations (Cameron 2005).

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%
<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>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.</p> <p>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]</p> <p>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.</p> <p style="text-align: center;"><i>based on any of the following:</i></p> <p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>			

Evidence:

Eligible under Criterion A3 as Critically Endangered

The population reduction over the next 75 to 100 years is projected to be 80 to 90%, based on (c) and (e) above.

The risk of extinction is likely to increase sharply as the current cohort of mature individuals continues to senesce in the absence of satisfactory survival to maturity of newly recruited individuals (Cameron 2005). All known populations in the Melbourne region are likely to become extinct within 50 years unless they are subject to targeted management intervention.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 75 to 210 year period, including both past and future (up to 100 years in the future), is inferred to be 80 to 90%, based on (b), (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

These figures are based on loss of past habitat. Future decline is based on the impacts of the identified threats.

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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 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 B as Endangered

The Area of Occupancy (AoO) is estimated to be 208 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

Any two of (a), (b) or (c) above are also satisfied.

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 Critically Endangered

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It is estimated that there are 100 to 350 (midpoint 150) mature individuals. This is based on the observation that most records of the species are for single or very few plants (no more than 20 mature individuals for records which specify population size) and that individuals are generally described as scattered at each site. There are no records of large populations. The taxon is very poorly represented in vegetation survey data. All lowland and geographically marginal populations for which population size is recorded consist of only 1-12 mature plants. A total of only 94-104 mature plants are currently known across the 15 extant populations for which population counts or estimates are available, with an average of only seven mature plants per population. If extrapolated to the three populations for which such estimates are unavailable, one of which is likely to be extinct, the total population across all known occurrences would be 108-118 mature plants, assuming that none of these additional populations had become extinct. Based on the expectation that there may be in the order of 20-50 extant populations with an average of seven mature plants per population, the total population size is estimated to fall in the range of 140-350 mature individuals. These estimates acknowledge the likelihood that some additional stands remain undetected but on the trends established by the available data it is unlikely that these are extensive or support large populations (Cameron 2005, Beardsell 2006 pers. comm., Walsh 2006 pers. comm.).

A continuing decline of 20 to 30% is estimated to occur within one generation.

Eligible under Criterion C2 as Critically Endangered

It is estimated that there are 100 to 350 (midpoint 150) mature individuals. The impacts of the identified threats are likely to result in a continuing decline. The number of mature individuals in each subpopulation is 50 or fewer.

Criterion D - Very small or restricted population ^a			
	Critically Endangered ^a	Endangered ^a	Vulnerable ^a
Number of mature individuals (observed or estimated) ^a	<50 ^a	<250 ^a	<1,000 ^a
D2 - Only applies to the VU category ^b 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. ^a	- ^a	- ^a	D2 - Typically: ^b AoO < 20 km ² or number of locations ≤ 5 ^a

Evidence:

Eligible under Criterion D as Endangered

It is estimated that there are 100 to 350 (midpoint 150) mature individuals.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

References

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