



## *Billardiera scandens* Common Apple-berry

### Taxonomy

*Billardiera scandens* Sm.

The common and widespread *Billardiera mutabilis* was formerly known as *B. scandens*. The taxon is reported to hybridise with *B. fusiformis* at St. Andrews (C. Beardsell pers. comm. to D. Cameron).

The distinction between this species and *Billardiera mutabilis* can be challenging, and the two taxa may be better recognised at infraspecific rank. In Victoria, *B. scandens* is distinguished by its villous fruits, short, stout pedicels that tend to remain somewhat erect, shrubbier habit and recurved leaf margins. However, intermediates with moderately hairy fruits and stout, often erect pedicels c. 15 mm long can be found where the two co-occur (e.g. Beechworth, Snowy River and Lake Hume) (VicFlora 2019).

### Current conservation status

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

### Proposed conservation status

Endangered in Victoria

Criteria A2ace+3ce+4ce

### Species Information

#### Description and Life History

*B. scandens* is a long-lived semi-scandent or climbing (twining) shrub to 3 m high (rarely), usually <1 m high. Fire sensitive and recovery of population from a long-lived soil-stored seedbank; reproduction by seed only and recruitment continuous as well as episodic post-fire. Probably self-fertile (i.e. not an obligate outcrosser) and assumed not to be self-pollinating; flowers are bisexual. Pollinated by honeyeaters (and perhaps other bird taxa); fruits ripen c. 3 months after pollination. The large fleshy berry-like fruits are ingested by birds and perhaps mammals, and seedbank dispersed, potentially some distance. Ripe fruits ultimately drop to the ground where they can be ingested by mammals. Cochrane et al. (2005) reported ingestion of *B. fusiformis* and dispersal of seeds by quokkas, potoroos, and rats in Western Australia.

#### Generation Length

The generation length of *B. scandens* is suspected to be 30 to 50 years. This is based on the longevity of this fire-sensitive taxon, and its episodic death and fire stimulated recruitment.

#### Distribution

Except for the Mt Macedon area, *B. scandens* records are east of Melbourne, with a concentration to the rear north-east of Melbourne, extending to far north-east Victoria.

#### Habitat

The taxon occurs in heathy, grassy, and shrubby woodland on a range of substrates including sandstone, metamorphics, and granite, at low to moderate elevations.

### Threats

Threats to the taxon include climate change, including decreased rainfall, increased evaporation, and extreme weather events, increased intensity and frequency of fire, inappropriate timing of prescribed fire in winter-spring, impacts of fire control activities, soil loss on bare post-fire substrates resulting from severe rainfall events, native vegetation clearing, roadworks and other infrastructure, damage to plants and soils by off-road recreational vehicles, weed invasion, and browsing by deer, especially Sambar Deer (*Rusa unicolor*). As the honeyeater guild declines because of reduced flowering and fragmentation of co-occurring floral resources, decreased bird pollination success is also a threat to the taxon.

### 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;">based on any of the following:</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 A2 as Endangered

The population reduction over the past 90 to 150 years is suspected to be 50 to 70%, based on (a), (c) and (e) above.

Past reduction of the taxon's population is based on habitat loss to agricultural clearing and the suite of threats operating.

The causes of the reduction may not have ceased, be understood or be reversible.

#### Eligible under Criterion A3 as Endangered

The population reduction over the next 90 to 100 years is suspected to be 50%, based on (c) and (e) above.

Future reduction of the taxon's population is based on the projected impacts of the identified threats, particularly climate change, weed invasion, and Sambar browsing.

# Billardiera scandens Common Apple-berry

## Eligible under Criterion A4 as Endangered

The population reduction over any 90 to 150 year period, including both past and future (up to 100 years in the future), is inferred to be 50%, based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

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 <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
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 Vulnerable

The Area of Occupancy (AoO) is estimated to be 552 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented, has 1 location, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

# Billardiera scandens Common Apple-berry

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

No population information this taxon as there have been no dedicated surveys for this taxon.

Criterion D. Very small or restricted populations				
		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 km <sup>2</sup> 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

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