

## *Philothea virgata* Tasmanian Wax-flower

### Taxonomy

*Philothea virgata* (Hook. f.) Paul G. Wilson

### Current conservation status

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

### Proposed conservation status

Endangered in Victoria

Criterion A2ce+3ce+4ce; B1ab(iii,v)+2ab(iii,v)

### Species Information

#### Description and Life History

The taxon is a slender shrub to c. 4 m high; branchlets glabrous, with many oil glands, lacking dark, stipule-like excrescences. Leaves obcuneate to elliptic or obovate, 10-20 mm long, 2-4 mm wide, shortly mucronate, thin-textured, slightly discolorous, dotted with many small oil glands, margins slightly recurved and glandular-crenate. Inflorescences axillary; pedicels solitary, without an obvious peduncle. Flowers 4(-5)-merous; sepals c. orbicular, c. 1 mm long; petals broad-elliptic, c. 5.5 mm long, white or pale pink, glabrous (but often papillose within), not persisting in fruit; anthers glandular beneath white apiculum; ovary glabrous, carpels free for most of their length. Follicles shortly beaked, c. 5 mm long; seed flattened-ellipsoid, c. 3 mm long. Flowers May-December (VicFlora 2017).

#### Generation Length

The generation length of *Philothea virgata* is estimated to be 35 to 80 years. This is based on a plausible longevity of 25-50 years or more, and likely episodic and sporadic or opportunistic recruitment from a long-persistent soil-stored seedbank. The taxon is inferred to recruit post-fire at pre-settlement intervals of 35-80 years with fire intensity and frequency likely to vary significantly between stands in wet forest habitats such as east of Mt Kaye and those in dry rocky habitats such as the summit of Mt Denmarsh. The taxon is likely to be a fire-sensitive obligate seed regenerator, with some capacity to resprout from the rootstock following fires of low to moderate intensity.

The taxon may also recruit opportunistically in response to outstanding seasonal conditions or localised site disturbance events.

#### Distribution

The taxon is localised and rare in Victoria, where it is known from near the summit of Mt Denmarsh, north of the well known stand to the east of the summit of Mt Kaye, and near Buldah in the far east, (also on Mt Imlay, near Eden in New South Wales). It also occurs in Tasmania and NSW.

#### Habitat

In Victoria, the taxon grows in tall wet forest, amongst rock or on shallow rocky soil (VicFlora 2017).

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## Threats

Historic decline due to habitat loss or agricultural activity is likely to be negligible, given the remote location of all known Victorian occurrences of the taxon.

Current threats are difficult to identify with any confidence. Long-term future threats are likely to include adult mortality and recruitment failure in response to extreme drought stress and targeted browsing by Sambar deer (*Rusa unicolor*) or other native and exotic herbivores, particularly during extended droughts and during the early stages of seed-based recruitment. The taxon may also be at long-term risk of recruitment failure in response to repeat fire events at intervals approaching the tolerable fire interval (TFI) for 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>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>
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## Evidence:

### Eligible under Criterion A2 as Endangered

The population reduction over the past 105 to 240 years is inferred to be 10 to 50%, based on (c) and (e) above.

There has been negligible historic habitat loss to agriculture, given the remote location of all known Victorian occurrences. However it is believed to have had all of its two Victorian sites occurring within the footprints of the 2019/20 bushfires. The taxon is believed to be generally fire tolerant, even in the context of these fires, but it is considered to have been at some risk of post-fire impacts.

### Eligible under Criterion A3 as Endangered

The population reduction over the next 100 years is suspected to be 20 to 50%, based on (c) and (e) above.

The taxon may recover from seed following the bushfires, but recovery depends on current and future control of feral herbivores, the likelihood of drought affecting recruitment and the risk of repeat fires.

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## Eligible under Criterion A4 as Endangered

The population reduction over any 105 to 240 year period, including both past and future (up to 100 years in the future), is suspected to be 20 to 50%, based on (c) and (e) above.

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 B1 and B2 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 48 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The Area of Occupancy (AoO) across the taxon's range is estimated to be 16 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

Two locations can be identified, given the striking habitat differences between stands in wet forest compared with stands in skeletal, rocky habitats. The frequency, intensity and habitat penetration of fire is likely to vary significantly in these contrasting habitats with, potentially, contrasting intensity in the operation of the identified threats.

It is estimated to have a continuing decline in (iii) and (v) above, based on the current and projected impact of the identified threats, and the impacts of post-fire herbivory, drought and repeat fires...

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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. There is no available estimate of population size for the 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

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](https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf)



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VicFlora (2017) Flora of Victoria: *Philotheca virgata*. Retrieved from:  
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