

## *Philothea angustifolia* subsp. *montana* Narrow-leaf Wax-flower

### Taxonomy

*Philothea angustifolia* subsp. *montana* (Paul G. Wilson) Paul G. Wilson

Some populations of *P. angustifolia* subsp. *montana* may resemble *P. difformis*, but are clearly distinguished by the distribution of hairs in rows along young branchlets, the petals which are glabrous outside, and the lack of a sunken terminal gland at the leaf apex (VicFlora 2021a).

### Current conservation status

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

### Proposed conservation status

Vulnerable in Australia

Criteria D1+2

If a continuing decline in habitat can be shown, this assessment could conceivably result in CR or EN under criterion B1.

### Species Information

#### Description and Life History

*P. angustifolia* is a shrub to c. 50 cm high; branchlets with dark, stipule-like excrescences and large oil glands, with hairs in narrow grooves between leaf decurrencies. Leaves c. terete, or obovate and flat or concave. Inflorescences terminal, 1-4-flowered, each pedicel without an obvious peduncle. Flowers 5-merous; sepals c. deltoid, c. 1 mm long; petals ovate, 5-8 mm long, white, usually with pink midrib, minutely pilose to glabrous inside, glabrous outside, persisting in fruit; anthers not glandular beneath white apiculum; ovary pilose in upper half, carpels free for most of their length. Follicles shortly beaked, c. 3 mm long; seed subreniform, c. 2.5 mm long (VicFlora 2021b).

*P. angustifolia* subsp. *montana* has leaves obovate, c. 4 mm long, 2 mm wide, flat or slightly concave, more or less fleshy, upper surface smooth, lower surface prominently glandular; petals glabrous (or glabrescent) within. The taxon flowers mostly from September to October (VicFlora 2021a).

#### Generation Length

The generation length of *Philothea angustifolia* subsp. *montana* is estimated to be 10 to 40 years. This is based on a longevity of plausibly 40 years, a pre-settlement disturbance interval plausibly in the 20-40 year range, and the likelihood that episodic mass recruitment greatly exceeds the proportion of recruitment responding continuously to small scale soil disturbances.

#### Distribution

The taxon is endemic to rocky areas of the northern Grampians at Mt Zero, Flat Rock, and Golton Gorge, the Black Range west of the Grampians, and the Lawloit Range (VicFlora 2021a).

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## Habitat

Plants are consistently recorded in rocky sites with skeletal, typically sandy soils in crevices, and in sparse heathy vegetation occasionally with *Eucalyptus alaticaulis* or *E. goniocalyx*. It is inferred to be either highly drought tolerant and/or fire sensitive and is therefore restricted to fire refuge habitats.

## Threats

The taxon, although inferred to be drought tolerant, is threatened in the long-term by prolonged climatic drying and warming resulting in the mortality of plants and in reduction in recruitment. Increasing fires in surrounding landscape are not considered a potential risk, nor is the taxon considered threatened by browsing as this is generally low in Rutaceae. However, it is possible that young plants may be targeted by grazers at the recruitment stage.

## IUCN Criteria

| Criterion A. Population size reduction.<br>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> |
|--|---------------------------------------|---|

## 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).

# *Philothea angustifolia* subsp. *montana* Narrow-leaf Wax-flower

| Criterion B. Geographic range in the form of either B1 (extent of occurrence) and/or B2 (area of occupancy)   |  |                          |                          |
|---|--|--------------------------|--------------------------|
|   | Critically Endangered<br>Very restricted | Endangered<br>Restricted | Vulnerable<br>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:

#### Ineligible under Criterion B

The Extent of Occurrence across the taxon's range is estimated to be 28 km<sup>2</sup>, and the Area of Occupancy (AoO) is estimated to be 28 km<sup>2</sup>, 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 <u>C1</u> or <u>C2</u>                   |   |  |   |  |
| <u>C1</u>  | 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) |
| <u>C2</u>  | 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

It is estimated that there are 350 to 700 mature individuals, but other thresholds under this criterion have not been met.

# *Philothea angustifolia* subsp. *montana* Narrow-leaf Wax-flower

| 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 km <sup>2</sup> or<br>number of locations < 5 |

## Evidence:

### Eligible under criterion D1 as Vulnerable

It is estimated that there are 350 to 700 individuals. This is based on collectors' notes, with known populations recorded as scattered with tens of plants. It is estimated that, on average, 2 x 2 km<sup>2</sup> grids may have between 50 and 100 plants.

### Eligible under criterion D2 as Vulnerable

The taxon is inferred to be very restricted. It has a restricted distribution, with an AoO of 28 km<sup>2</sup> and one to two locations, such that this restriction makes the taxon capable of becoming Critically Endangered or Extinct within a timeframe of one or two generations in response to the identified threats, notably prolonged climatic drying and warming.

**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)
- VicFlora (2021a). Flora of Victoria, Royal Botanic Gardens Victoria: *Philothea angustifolia* subsp. *montana*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/e40582b8-bc75-4dde-a3a6-a6f23443a2e7>
- VicFlora (2021b). Flora of Victoria, Royal Botanic Gardens Victoria: *Philothea angustifolia*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/083f9362-6340-4f7b-b8a2-c9ba26f7adfe>