

## *Asperula ambleia* Stiff Woodruff

### Taxonomy

*Asperula ambleia* Airy Shaw & Turrill

Galbraith (1977) provides the alternative English name Shrubby Woodruff for the species (SAC 2003)

### Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2003).

Categorised as Endangered 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 or ascending sub-shrubby perennial with a woody rootstock and rigid, minutely hairy, 4-angled stems to 30 cm long which are often woody toward the base. Leaves and stipules are sessile, unequal, in whorls of 4 with the stipules smaller than the leaves. Leaves are linear to linear-oblong, mostly 2-5 mm long and 0.3 mm wide, erect, more or less obtuse with an apical hair-tuft, surfaces virtually glabrous, margins recurved. Inflorescences are terminal cymes, mostly 1-3 flowered, usually longer than the leaves. Plants are dioecious with both male and female flowers on the one plant. Corollas are 2-3 mm long on male flowers and 2 mm long on female flowers, white, with the corolla tube longer than the lobes. Fruit are deeply two-lobed, comprising two indehiscent mericarps which are about 2 mm long and black. Flowering is reported for September to March (SAC 2003).

#### Generation Length

The generation length of *Asperula ambleia* is inferred to be 20 years. As an erect sub-shrubby perennial in rocky areas along river banks, the taxon is likely to live for 10-50 years. The taxon may be a flood-mediated recruiter and potentially a flood-mediated disperser. This means that it is likely to recruit when there is significant change resulting from flood events, which, in the pre-settlement past, may have occurred every 20 years.

#### Distribution

In Victoria, the taxon is apparently confined to a single site on the banks of the Snowy River at Bete Bolong near Orbost in East Gippsland (Jeanes 1999; VicFlora 2017), where the taxon was collected by Norman Wakefield in 1946 (Beaulehole 1981). The Victorian occurrence therefore represents the southern limit of geographic range for the taxon and a significant disjunction from all other subpopulations (SAC 2003).

#### Habitat

In Victoria, the taxon is known only to occur among rocks on the banks of the Snowy River at Bete Bolong (Jeanes 1999; SAC 2003; VicFlora 2017).

### Threats

The taxon is prone to reduced reliability of flood events. If it is still extant, the taxon is also at risk of elimination from stochastic events such as flood, fire or grazing pressure.

The current status of the taxon in Victoria is poorly known and the taxon has apparently not been observed in the field for many years, despite a number of surveys having been conducted in the lower Snowy district by a range of workers. Beauglehole (1981), for example, did not record the taxon during extensive surveys conducted throughout the region. The taxon may simply be naturally rare. In the absence of further records, there is the possibility that it has become extinct in Victoria in the period since Wakefield collected it at Bete Bolong in 1946. The downstream part of the Bete Bolong district is now closely settled farmland and the population may have been eliminated through habitat loss or modification (SAC 2003). It is also unclear whether the population at this site was well established at the time or whether the single occurrence was simply a vagrant which may have been dispersed downstream by floodwaters from more established stands in the headwaters of the Snowy River (SAC 2003). With the modification of flow regimes following the construction of the Snowy Mountains Hydro-electric Scheme, such vagrant flood-mediated dispersal events may also have become a very rare event. If the taxon still survives on riverbanks in the lower Snowy River area then the population is at risk, on demographic grounds, of elimination through stochastic events such as flood, fire or grazing pressure (SAC 2003).

### 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

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<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:

#### Eligible under Criterion B1 as Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 4 km<sup>2</sup>, based on accepted, post-1970 records from the Victorian Biodiversity Atlas. The EoO has been made equal to the AoO to ensure consistency with the definition of the AoO as an area within the EoO.

The taxon is estimated to have one location, as it occurs in a single site, where all individuals are highly susceptible to the identified threats, notably the reduced reliability of flood events.

It has a continuing decline in (iii) above.

#### Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 4 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it has one 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 is insufficient evidence to determine the number of mature individuals. The taxon has only been collected once in Victoria in 1946 with no record of population size at the time.

| 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<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 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

Beaglehole, A.C. (1981). *The Distribution and Conservation of Vascular Plants in the East Gippsland area, Victoria*. Portland: Western Victorian Field Naturalists Club Association.

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VicFlora (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Asperula ambleia*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/6ec5a041-f7a9-4754-8368-87bbd3d267e9>