Threatened Species Assessment

Philydrum lanuginosum
Woolly Waterlily

Taxonomy

Philydrum lanuginosum Banks & Sol. ex Gaertn.

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 B2ab(i,ii,iii,iv,v)c(iv)

Species Information

Description and Life History

The taxon has leaves 15-45 cm long, glabrous; basal sheath 7-16 cm long. Inflorescence borne on an axis (10-)25-90 cm long; axis woolly with soft white hairs; inflorescence-leaves 15-25 mm long, 7-10 mm wide, progressively smaller (hence, bract-like) from base to apex of inflorescence, woolly with soft white hairs; 10-c. 40-flowered per spike. Perianth yellow; outer segments ovate, 10-12 mm long, 7-10 mm wide; inner segments narrowly ovate, 3-6 mm long, 1-2 mm wide; stigma capitate. Fruit woolly with soft white hairs; valves 7-11 mm long. The taxon flowers from December to March (-April) (VicFlora 2018).

Generation Length

The generation length of *Philydrum lanuginosum* is estimated to be 2 to 5 years. The taxon is regarded as a perennial herb, however collectors' notes indicate that it may be an annual, or at least only a short-lived perennial. The generation length reflects the upper likely period that some ephemeral wetlands may be without inundation.

Distribution

The taxon is scattered, and very localised throughout lowland Victoria in shallow freshwater swamps. It is still present in the Melbourne area, but natural populations are possibly now extinct, as at least some recent records from this area have been noted as being planted. Likewise, it has not been recorded in the Kerang area since 1976 and may now be extinct there. The taxon occurs in all states except South Australia and Tasmania (VicFlora 2018).

Habitat

The taxon occurs in seasonally wet depressions and swamps, usually in freshwater (VicFlora 2018).

Threats

The taxon is threatened in the long-term by climatic drying and warming, resulting in altered flooding frequencies, particularly in the Grampians region and Murray floodplain. It may also change the vegetation structure, with the invasion of woody taxa into areas previously too wet for them to persist. Isolated populations in western Victoria are small and low genetic diversity is likely to be an issue. However, it is likely that these populations have arisen due to dispersal by water birds, and ongoing dispersal may still be possible, hence broadening the gene pool. In some areas, particularly around Melbourne and Bairnsdale, urban development may be a major threat to this taxon with

wetlands drained or having significantly altered hydrology. Weed invasion is likely to be a major threat, particularly by *Typha, Phragmites,* and *Rubus*, as well as by woody taxa, such as *Kunzea* and *Leptospermum*.

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%

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

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.

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*]

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.

based on any of the following:

(a) direct observation [*except A3*]

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Evidence:

Eligible under Criterion A2 as Vulnerable

The population reduction over the past 6 to 15 years is suspected to be 30%, based on (b), (c) and (e) above.

While historic reduction is likely to be considerable, reduction in the past fifteen years is likely to be no more than 30%. Reduction is likely to be greatest in the Provenance Ponds area, where shrub encroachment has been significant in the past two decades. The subpopulation at Kerang has not been recorded since 1976 and has possibly become locally extinct there during the Millennium Drought.

Eligible under Criterion A3 as Vulnerable

The population reduction over the next 6 to 15 years is suspected to be 30%, based on (b), (c) and (e) above.

Future decline is based on the identified threats, including ongoing climatic drying and the expansion of woody weeds.

Eligible under Criterion A4 as Vulnerable

The population reduction over any 6 to 15 year period, including both past and future, is suspected to be 30%, based on (b), (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 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²
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 B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 91 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to have 5 locations as subpopulations are widely dispersed and may be variably affected by stochastic events

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, based on the current and projected impact of the identified threats.

It is estimated to have extreme fluctuations in (iv) above, as it is a short-lived perennial that is highly dependent on rainfall. Populations in ephemeral wetlands are likely to fluctuate by ten-fold depending on seasonal rainfall. In dry years, very few plants are likely to germinate, while in more favourable years germination is likely to be significantly higher. Population numbers in more permeant wetlands are probably more stable.

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 Vulnerable

It is estimated that there are 5,000 to 10,000 mature individuals. Herbarium records indicate that plants vary from rare to locally common or abundant. This is likely to vary between years according to rainfall. More recent records from Gippsland indicate there are stands of 100s of plants. Isolated subpopulations are estimated to contain more than 100 plants. Most plants, therefore, are likely to occur in Gippsland. Based on the number of records from this area and an estimated stand of 300-600 plants, the total population is estimated to be between 5000-10000 individuals.

There is estimated to be a continuing decline of 30% within three generations.

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 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 km2 or number of locations ≤ 5

Evidence:

Ineligible under Criterion D

It is estimated that there are 5,000 to 10,000 mature individuals, which exceeds the thresholds for criterion D.

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

VicFlora (2018). Flora of Victoria, Royal Botanic Gardens Victoria: *Philydrum lanuginosum*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/119b6317-e987-4caf-9b57-5b71007c0218