Threatened Species Assessment

Microtis orbicularis
Swamp Onion-orchid

Taxonomy

Microtis orbicularis R.S. Rogers

VicFlora (2020) states that the recent placement of this species into the genus *Hydrorchis* as *Hydrorchis orbicularis* (R.S. Rogers) D.L. Jones & M.A. Clem. has not been generally accepted,

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria A2ac+3c+4ac; B2ab(i,ii,iii,v)

Species Information

Description and Life History

Flowering stem 10–40 cm tall, slender, characteristically bent at apex of leaf-sheath. Leaf erect, 10–25 cm long, almost solid, green; sheath opening close to bottom of inflorescence. Flowers 3–30, green, often with red tints, erect, in moderately loose spike 2–10 cm long; ovary obovoid, 2–3 mm long, sessile; dorsal sepal ovate, 1–2 mm long, obtuse, hooded, gradually narrowing towards base; lateral sepals linear, similar in length to dorsal sepal, somewhat acute, appressed to ovary, concealed below labellum; petals ovate-lanceolate, 1–2 mm long, spreading or recurved below the dorsal sepal. Labellum pendulous, flat, more or less circular, 1–2 mm long, fleshy; margins entire; apex rounded; lamina somewhat concave, often with small pit in centre; calli absent. Column with minute conical fleshy auricles. Flowers Sept.-Dec. (FloraVic 2020).

It is a semi-aquatic orchid that spends the late autumn, winter and early spring submerged. The seasonal swamps in which it grows are starting to dry out as the species flowers, with flowering plants usually in drying mud rather than standing in water (Backhouse et al. 2016).

Generation Length

The generation length of *Microtis orbicularis* is estimated to be 20 to 40 (midpoint 30) years. Generation time for non-colonial terrestrial orchids is estimated to be a nominal 30 years based on the annual replacement of the mother tuber by daughter tubers. Whilst somatically immortal, each individual is susceptible to endogenous exhaustion or environmental causes of mortality at rates likely to result in replacement at intervals of several decades only. Such orchids are classed as obligate seed regenerators (OSRs) reliant on seed-based recruitment for population maintenance.

Distribution

It occurs in south-west Victoria (e.g. Portland, Grampians, Little Desert) and east of Melbourne on French Island, the Wonthaggi area (where it is possibly now extinct) and Wilsons Promontory (VicFlora 2020). The altitude range is 25-220 metres ASL. It also occurs in WA, SA, Tas. (Backhouse et al. 2016).

Habitat

The taxon grows in soaks, wet depressions and around swamp margins in heath and heathy woodland, on black peaty to silty clay loam soils. This semi-aquatic species often flowers in shallow water around the margins of swamps (Backhouse et al. 2016).

Threats

The species has almost certainly declined through drainage of shallow seasonal wetlands across southern Victoria, and some populations have apparently died out during the prolonged drought of the 1990s (Backhouse et al. 2016).

Threats would be similar to those described for *Prasophyllum frenchii* in Duncan (2010); both species grow in similar swamp edge habitat. Grazing by native herbivores such as kangaroos and/or introduced herbivores such as rabbits, hares, feral goats and domestic stock is an existing or potential threat at most sites. A variety of weed species, particularly perennial grasses, causes serious problems at most sites. Other threats include inappropriate fire regimes, hydrological changes, and climate change-induced drying of swampy sites.

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 Endangered

The population reduction over the past 60 to 120 years is estimated to be 40 to 70%, based on (a) and (c) above.

The species has almost certainly declined through drainage of shallow seasonal wetlands across southern Victoria, and some populations have apparently died out during the prolonged drought of the 1990s (Backhouse et al. 2016).

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 60 to 100 years is projected to be 30 to 60%, based on (c) above.

The taxon is subject to continuing decline in population size due to the identified threats.

Eligible under Criterion A4 as Endangered

The population reduction over any 60 to 120 years period, including both past and future (up to 100 years in the future), is estimated to be 45 to 70%, based on (a) and (c) 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 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 170 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is inferred to be severely fragmented, as there are multiple, small isolated subpopulations that are all at risk, such that there is increased extinction risk and little or no probability of recolonisation should subpopulations become extinct.

It has a continuing decline in (i), (ii), (iii) and (v) 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

It is estimated that there are 15,000 to 30,000 mature individuals, which exceeds the thresholds for criterion C.

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 15,000 to 30,000 mature individuals.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

References

Backhouse, G., Kosky, B., Rouse, D., and Turner, J. (2016). *Bush Gems: A Guide to the Wild Orchids of Victoria, Australia*. Melbourne, Victoria: EBook.

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

Duncan, M. (2010). National Recovery Plan for the Desert Greenhood *Pterostylis xerophila*. Department of Sustainability and Environment, Melbourne.

Jones, D.L., Clements, M.A., Sharma, I.K. and Mackenzie, A.M. (2002), Nomenclatural notes arising from studies into the Tribe Diurideae (Orchidaceae). *The Orchadian* 13(10): 462

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Microtis orbicularis*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/94120232-2b62-48ac-b005-768fcefd6d45