Threatened Species Assessment

Brasenia schreberi
Water Shield

Taxonomy

Brasenia schreberi J.F. Gmel.

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1998).

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

Proposed conservation status

Critically Endangered in Victoria

Criterion B1ab(i,ii,iii,iv,v)

Species Information

Description and Life History

Brasenia schreberi has stems 3-10 mm diam., covered in mucilage. Leaves elliptic, 2.5-9 cm long, 1.5-6 cm wide; petioles to 30 cm long or more (bringing leaf to water surface); young leaves inrolled longitudinally. Flowers long-pedicellate (bringing flower to water surface); perianth segments 9-18 mm long, dark reddish-black or purplish; stamens 12-37, filaments reaching 1 cm long (extending after pollination of stigma); carpels 6-16, ovules usually 2 per carpel. Fruit beaked. Flowers Oct.-Feb. (VicFlora 2016).

Brasenia schreberi is a rhizomatous/stoloniferous winter-deciduous perennial macrophyte that potentially forms extensive clones. The taxon also propagates by seeds. Its leaves die off at the onset of winter after which it overwinters as terminal bud on a rhizome with its leaves regrowing in spring.

The taxon is monoecious with axilliary flowers. Its flowers rise to the surface over two days, once in a female phase to be wind pollinated, and then in male phase a day later to release pollen. After pollination, its flowers retreat to ripen the seeds under water. Its seeds have been documented as waterfowl dispersed (USA).

Generation Length

The generation length of *Brasenia schreberi* is inferred to be iindefinite since it is known to produce vegetatively. Generation length cannot, by definition, be determined in a vegetatively reproducing taxon.

Distribution

Brasenia schreberi is only known in Victoria in recent times from shallow lagoons of the Goulburn River and tributaries near Nagambie, where it is locally common. There are early records from the lower Ovens and Mitta Mitta Rivers suggest a former wider range (VicFlora, 2016). The taxon also occurs in New South Wales and Queensland (where it may now be extinct). It also occurs in tropical parts of Africa, Asia and America. It

Habitat

Brasenia schreberi grows in full sun on a nutrient-rich alluvium substrate where it forms extensive dense cover over the water surface. It grows in clear permanent water up to 1.5 m deep (although usually not more than c. 1 m deep) where the water level does not fluctuate much (i.e., little summer drawdown) such as lakes, billabongs and off-channel stream wetlands.

Threats

The threats to this taxon are declining rainfall as a function of climate change, river regulation or hydrological change, invasion of exotic aquatic macrophyte weeds, notably *Cabomba caroliniana* and *Nymphaea mexicana* and *Nymphaea* hybrids.

Carp may also possibly disturb/eat young recruits and waterfowl may possibly graze plants (however this has not been documented). The taxon has gone extinct from three of the four known former locations.

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 300 years is inferred to be 50 to 70%, based on (c) above.

Populations at three of the four former sites in Victoria are now extinct.

Eligible under Criterion A3 as Endangered

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

Future reduction of the taxon's population is based on the projected impacts of identified threats.

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 B1 as Critically Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 45 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas.

It is inferred to have 1 location as the same threats operate on all occurrences. It has a continuing decline in (i), (ii), (iii) and (iv) above, based on the current and projected impact of the identified threats.

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 suspected that there are 50,000 to 100,000 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:

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

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