Threatened Species Assessment

Rumex crystallinus
Glistening Dock

Taxonomy

Rumex crystallinus. Lange

Willis included *R. tenax* in his concept of *R. crystallinus*, but, as outlined by Rechinger, the two taxa are quite distinct, and possibly not even closely related (VicFlora, 2019).

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(iii,v)c(iv)

Species Information

Description and Life History

The taxon is an annual to c. 40 cm high, often drying red-brown, with several to many, usually simple branches from base. Basal leaves with petioles shorter to longer than lamina; lamina oblong, 2-8 cm long, 2-12 mm wide, bases truncate, usually slightly dilated; margins strongly crisped, sometimes recurved; upper leaves reduced but petiolate. Inflorescence often occupying most of plant; flower 'whorls' many-flowered separated by less than 1 cm, contiguous above, each subtended by a leaf. Fruiting valves narrowly triangular or trullate, 1.5-2 mm long, 0.5-1 mm wide (excluding teeth), 1-2-toothed near base (rarely the teeth absent); callosities present on each valve, c. one-third as long as valve; fruiting pedicel subequal to or slightly longer than valves, jointed near base. Nut c. 1 mm long. The taxon flowers from October to March (dependent on seasonal rains or river levels) (VicFlora, 2019).

Generation Length

The generation length of *Rumex crystallinus.* is estimated to be 5 to 25 (midpoint 15) years. The generation length is based on the estimated mean interval between peak rainfall and flood events mediated, under undisturbed pre-European settlement conditions, by La Nina events. The taxon is an annual herb which recruits episodically following peak rainfall or flood events from a soil-stored seedbank.

Distribution

The taxon is rare in Victoria, occurring only in the far north-west of the state on the Murray River floodplain, recorded only from Lakes Wallawalla, Hattah and Lalbert. Also inland parts of all mainland states (VicFlora, 2019). The taxon is apparently reliably recorded also near the banks of the Murray River near Neds Corner Station and at Kings Billabong south-east of Mildura.

In 1981 Beauglehole collected specimens which he determined as *R. crystallinus* at Tang Tang Swamp Wildlife Reserve north of Bendigo, at Two Tree Swamp Wildlife Reserve north-west of Rushworth and, in 1979, at Reedy Swamp north of Shepparton. In 1951 Elliot collected a specimen also determined as *R. crystallinus* at Tatura. It is likely that these four collections are all referable to *R. tenax* which was previously included within a broad circumscription of *R. crystallinus*.

The precise distribution of *R. crystallinus* in Victoria is unclear since a small proportion of unvouchered site records of *R. crystallinus* s.l. in the Victorian Biodiversity Atlas (VBA) may be referable to *R. crystallinus* s.s. although a majority are likely to be referable to *R. tenax*.

Habitat

The taxon is recorded only from the margins and drying beds of inland lakes (VicFlora, 2019).

Threats

The taxon is a habitat specialist dependent on the hydrological stability of its lake bed or floodplain habitat. It is therefore threatened by any reduction in the reliability of flood events in response to climatic drying and diversion of flood waters for irrigation and town water supplies.

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:

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 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 Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 9,915 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to be severely fragmented naturally at both the regional and landscape scales and also anthropogenically at the landscape scale in some districts, with all geographically isolated occurrences separated at spacings which exceed the dispersal range of the taxon which has no specialised mechanism for long-distance dispersal.

It is estimated to have 2 locations. It has a continuing decline in (iii) and (v) based on the current and projected impact of the identified threats.

It is estimated to have extreme fluctuations in (iv) above in response to rainfall and flood events, and it is suspected that these seasonal fluctuations approach or exceed the tenfold threshold.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 52 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, the taxon is severely fragmented, has 2 locations, has a continuing decline in iii) and (v) and has have extreme fluctuations in (iv) 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 no available estimate of population size for the taxon, which is likely to be subject to significant fluctuations in population size between successive recruitment events.

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

DEPI (2014). *Advisory list of rare or threatened plants in Victoria - 2014.* Department of Environment and Primary Industries, Melbourne.

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens Victoria: *Rumex crystallinus*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/ad9e922e-f832-4755-b541-9abbeddb21ad