



Surreya diandra Mallee Hemichroa

Taxonomy

Surreya diandra (R. Br.) R. Masson & G. Kadereit

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* as *Hemichroa diandra* (SAC 1991).

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

Proposed conservation status

Critically Endangered in Victoria

Criteria A2c+3c; B1ab(ii,iii,v)+2ab(ii,iii,v); C2a(i,ii); D

Species Information

Description and Life History

A perennial spreading woody herb or low shrub measuring 30 cm tall by up to 100 cm wide, with many woody stem bases that branch at ground level. Stems and leaves wholly glabrous or very sparsely papillate on new growth. Leaves alternate, sessile, with partly sheathing bases, linear, c. 1 cm long, 1–2 mm wide, broadly concave on upper surface, usually recurved and shortly pointed at apex. Flowers sessile; bracteoles narrowly ovate, c. 3 mm long; tepals narrowly ovate, 4–5 mm long, acute, white or pink; stamens 2, united on one side of ovary; style c. 2 mm long, bifid to c. 0.5 mm below apex. Utricle ovoid, 2–3 mm long. The taxon flowers from November to January (VicFlora 2018).

Generation Length

The generation length of *Surreya diandra* is suspected to be 30 to 50 years. It is unknown how long individual plants live. Given that there was only a single plant alive in 1981, evidently it is the same plant which is alive today and is at least 40 years old.

Distribution

The species is currently known only from a single plant at the southern margin of a saline discharge pan on private land, approximately 4 km west of Nowingi and 50 km south of Mildura. There are a small number of historical records from similar habitat in the north-west of the State. Numerous surveys for Mallee Hemichroa at suitable saline sites in north-western Victoria have been conducted by J.H. Browne in association with Dr R.F. Parsons of La Trobe University. All have been unsuccessful (DSE 2003). The plant is now believed to be restricted to the Nowingi site. The species also occurs in Western Australia, the Northern Territory, South Australia and New South Wales.

Habitat

In Victoria, the taxon occurs at the Nowingi site about 15 m from the southern edge of a saline or regional groundwater discharge pan. The soil in the plant's vicinity is undoubtedly saline but is raised approximately 80 cm above the level of the floor of the saline pan. *S. diandra* occurs in association with *Frankenia crispera* (Hoary Sea-

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heath), *F. foliosa* (Leafy Sea-heath), *Riccia albida* (Chalk Crystalwort), *Sclerolaena uniflora* (Two-spined Copperburr), *Tecticornia moniliformis* (Ruby Glasswort) and *T. pruinosa* (Bluish Glasswort) (DSE 2003).

In South Australia, the species is a component of coastal and near-coastal saline shrublands around Spencer Gulf and Gulf of St Vincent with some records existing at inland sites near Lake Eyre. In New South Wales, it occurs around a salt lake/pan margin, in chenopod shrubland.

Threats

Trailbike riding has in the past damaged the plant at Nowingi. The single plant is now in a fenced area and is protected from grazing. Climate change is a threat if it leads to changes in the hydrology or salinity at the site. The risks associated with small population size are significant, and the long-term chances of the single plant surviving and reproducing *in situ* are remote.

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%

<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>
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Evidence:

Eligible under Criterion A2 as Critically Endangered

The population reduction over the past 90 to 150 years is suspected to be 90%, based on (c) above.

There is little information to determine the past decline, but historical records show that it has undoubtedly declined to a single plant. Given that the area had been subject to trailbike damage and grazing, it is likely the number of plants would have been higher.

The causes of the reduction may not have ceased, be understood or be reversible.

Eligible under Criterion A3 as Critically Endangered

The population reduction over the next 90 to 100 years is suspected to be 0 to 100%, based on (c) above.

It may persist if urgent management action is taken, but otherwise the long-term chances of the single plant surviving and reproducing *in situ* are remote.

Evidence:

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 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA). The EoO has been made equal to the AoO to ensure consistency with the definition of AoO as an area within the EoO.

It is estimated to have one location. It has a continuing decline in (ii), (iii) and (v) above.

Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 4 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it has one location and a continuing decline in (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:

Eligible under Criterion C2 as Critically Endangered

It is estimated that there is one mature individual. It was first collected in Victoria in 1949, but the notes on the herbarium label do not indicate how many plants there were at the time. The species was again collected in 1950 by a different collector, but the notes on the herbarium label indicate "Apparently the second record for Victoria. [Two plants found but not at the same clay pan as the first record 3 Nov 1949. MEL 233558.]". It is unclear what the original number of plants in 1949, and 1950.

Efforts have been made to propagate the species and plant it out at the site. It is unknown if the planted stock originates from the original plant, in which case it will be genetically identical and equates with 1 plant. If the planted stock is of a different provenance then the number of plants is more than one.

There is an estimated continuing decline, the number of mature individuals in one subpopulation is fewer than 50 and the percentage of plants in each subpopulation is 100%.

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 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 km ² or number of locations ≤ 5

Evidence:

Eligible under criterion D as Critically Endangered

It is estimated that there is one mature individual.

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.

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