Threatened Species Assessment

Viola sieberiana
Tiny Violet

Taxonomy

Viola sieberiana Spreng.

Viola. seppeltiana or *Viola hederacea* subsp. *seppeltiana* is considered synonymous with *V. sieberiana* in VicFlora online and by Theile *et al.* (2018). The latter occurs in central coastal and subcoastal New South Wales. Further research is likely to show that they are not conspecific.

The taxon was previously treated as *V. hederacea* subsp. *seppeltiana*, but its overall morphology appears to be that of *V. sieberiana* or a closely related entity, yet to be segregated. Its occurrence in south-eastern SA and south-western Victoria is very disjunct from its other occurrence in sandstone country in the Sydney area. Plants in the Grampians are rather atypical and may represent yet another undescribed taxon; the leaves are distinctly purplish and variably hairy (VicFlora 2020).

Some Victorian plants previously assigned to *V. sieberiana* Spreng. are now referrable to *V. fuscoviolacea* (L.G.Adams) T.A.James, and *V. cleistogamoides* L.G.Adams) Seppelt (VicFlora 2020).

Current conservation status

Categorised as Rare 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)

Species Information

Description and Life History

The taxon is a stoloniferous perennial herb, glabrous to scabrous- or papillate-pubescent. Leaves tufted, lamina broadly ovate to rhombic, 5–15(–20) mm long, 7–20(–30) mm wide, base broadly cuneate to nearly truncate, apex obtuse to subacute, margins shallowly 5–9(–13)-toothed; petioles 1–5(–8) cm long; stipules free, linear-lanceolate, 2–5 mm long, usually shallowly laciniate. Flower-scapes slightly shorter than to (mostly) exceeding leaves, to 8 cm long, bracteoles near middle. Sepals lanceolate, 2–5 mm long, acute, basal appendages small; petals mostly 4–6 mm long, uniformly sky-blue to lilac, lower (anterior) petal rectangular to obovate, lacking a spur, nervation indistinct, lateral petals glabrous or with a small central patch of small papillae, not or barely twisted. Capsule ovoid, 6–8 mm long. Seeds ovoid, ca 2 mm long, slightly glossy dark reddish-brown. Flowers September-December (VicFlora 2020). It has leaf rosettes borne on slender stems, expanding vegetatively by new genets arising by seed.

It is fire sensitive, recovering from soil-stored seedbank of an unknown longevity. Its breeding system is undocumented, but it is evidently without cleistogamous flowers that are self-pollinated in bud. Whether or not it is self-fertile, i.e. whether pollinators deliver self-pollen to a stigma, is unknown, but flowers are chasmogamous (open and allowing cross-pollination). Pollination is by insects, probably solitary bees, for a pollen or nectar reward. Seeds are dispersed explosively from the capsule probably only a few metres. Whether or not secondary dispersal occurs via ants is not known, however such dispersal is widespread in *Viola* spp.

Generation Length

The generation length of the taxon is suspected to be 25 to 30 years. This is based on the frequency of recurrent fire affecting this fire sensitive but otherwise potentially long-lived herb.

Distribution

The taxon occurs in far south-west Victoria and the Grampians.

Habitat

The taxon occurs in heathy woodland and heathland on sandy soils derived from various geologies.

Threats

Threats to the taxon include climate change (decreased rainfall, increased evaporation, and extreme temperatures); increased frequency and intensity of fire; inappropriate timing of prescribed fire (winter-spring); impacts of planned burns; elevated fuel loads of invasive alien plants, especially *Acacia longifolia* subsp. *sophorae* (Coast Wattle) causing the sterilisation of the soil and destruction of seedbanks; and weed invasion, especially Coast Wattle and *Pittosporum undulatum* (Sweet Pittosporum)

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 75 to 90 years is suspected to be 40%, based on (c) above.

Past reduction of the taxon's population is based on historic threatening processes, predominantly land clearance for agriculture and weed invasion in the last forty or more years (mostly Coast Wattle). The causes of reduction may not have ceased, be understood or be reversible.

Eligible under Criterion A3 as Vulnerable

The population reduction over the next 75 to 90 years is suspected to be 30%, based on (c) above.

Future reduction of the taxon's population is based on the projected impacts of suite of threatening processes, especially climate change, weed invasion and intense fire.

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 312 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented based on its limited dispersal ability, the barriers to dispersal, and/or the lack of habitat separating the subpopulations. Such fragmentation precludes the possibility of recolonisation in the event of local extinction.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the current and projected impact of the identified threats, especially climate change, weed invasion, and intense fire.

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 insufficient evidence to determine the number of mature individuals.

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

Adams, L.G. (1982). *Violaceae.* In *Flora of Australia Vol. 8* (pp. 91-109, 386-387). Melbourne: CSIRO Publishing.

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

Thiele, K.R., Prober, S.M. (2003). New species and a new hybrid in the *Viola hederacea* species complex, with notes on *Viola hederacea* Labill. *Muelleria. 18*: 7-25

Theile, K.R., de Salas, M., Walsh, N.G., Messina, A., Little, R.J., Prober, S.M. (2018). *Viola curtisae,* a new rank for a poorly understood species, with notes on *V. hederaceae* subsp. *sieberiana. Muelleria 36*: 107-111.

VicFlora (2020). Flora of Victoria, Royal Botanic Gardens Victoria: *Viola sieberiana*. Retrieved from https://vicflora.rbg.vic.gov.au/flora/taxon/f4e816c9-20f4-4e91-8b4f-f24e578f1e43