Threatened Species Assessment

Cyanothamnus nanus var. *pubescens*
Dwarf Boronia

Taxonomy

Cyanothamnis nanus var. *pubescens* (Benth.) Duretto & Haslewood

This was previously known as *Boronia nana* var. *pubescens* (Benth.) J.H. Willis

Current conservation status

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

Proposed conservation status

Endangered in Australia

Criterion B2ab(iii)

Species Information

Description and Life History

The taxon is a prostrate or procumbent subshrub with branches to c. 30 cm long; branches pubescent between decurrent leaf-bases. Leaves simple or trifoliolate, plane; leaflets and simple leaves narrow- to broad-linear to elliptic, ovate or obovate, 2–15 mm long, 0.5–3.5 mm wide, plane or slightly conduplicate, slightly discolorous; petiole 0.5–5 mm long. Inflorescence 1–2(–6)-flowered; peduncle 1–7 mm; pedicel 2–16 mm long. Sepals deltoid to triangular or ovate to broad-ovate, imbricate, 1–3.5 mm long, 0.5–1.5 mm wide; petals imbricate, midvein not raised, 3–5.5 mm long, 1.2–3 mm wide, persistent; filaments pilose; style hirsute at base, longer than rounded stigma. Follicles glabrous or glabrescent, 3–4.5 mm long; seeds 2.2–2.5 mm long, black to dark brown, dull. (VicFlora 2021a).

The description for *C. nanus* var. *pubescens* is the same as above, but the leaves are trifoliolate; indumentum of 0.2-0.5 mm long, simple, usually arched hairs. The taxon flowers in spring (VicFlora 2021b).

Generation Length

The generation length of *C. nanus* var. *pubescens* is estimated to be 50 to 75 years. The taxon is capable of resprouting (see MEL 2392506) suggesting a longevity plausibly from 75-100 years and generation time of plausibly more than 50 years. This is based on an inferred pre-settlement fires frequency within 35-50 years.

Distribution

The taxon is apparently endemic to Victoria, occurring between the Grampians and Ben Major near Lexton (VicFlora 2021b).

This taxon apparently only occurs in the Grampians and nearby ranges to the east towards Beaufort. Records from the south west, Otways and the north east are likely to be misidentified plants of either var. *nana*, which can occasionally be slightly hairy, or possibly *B. pilosa* var. *torquata*, which is also very hairy and occasionally sub-erect to spreading shrub.

Habitat

The taxon grows in open-forest, woodland and heath on rocky or sandy substrates (VicFlora 2021b).

Threats

The taxon is potentially threatened by imposed anthropogenic fire regimes and climatic warming and drying which, synergistically, increase the risk of recruitment failure in response to repeat fire events and extreme drought stress.

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 5,060 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

It is estimated to have 1 location, as all key identified threats apply across its range and can rapidly affect all individuals of the taxon present.

It has a continuing decline in (iii) above, based on the current and projected impact of the identified threats, including inappropriate fire regimes and the increasing frequency and intensity of wildfires due to climatic warming and drying.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 276 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it has 1 location and has a continuing decline in (iii) 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 6,900 to 13,800 mature individuals, but other thresholds under this criterion have not been met.

There are little data available on population size. Herbarium records vary from plants recorded as uncommon, with less than 10 plants, to locally common, with hundreds of plants. It is estimated that on average there is likely to be between 100-200 plants in each of the 69 2 x 2 km² grids.

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 6,900 to 13,800 mature individuals.

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. 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

VicFlora (2021a). Flora of Victoria, Royal Botanic Gardens Victoria: *Cyanothamnus nanus*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/8353bdb6-c238-49b3-b930-573eacbd7b1e

VicFlora (2021b). Flora of Victoria, Royal Botanic Gardens Victoria: *Cyanothamnus nanus* var. *pubescens*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/25a22a22-97e1-4bee-92ce-35c6bf9ef6da