

Notice of and reasons for the Final Determination

The NSW Threatened Species Scientific Committee, established by the *Biodiversity Conservation Act 2016* (the Act), has made a Final Determination to list the shrub *Homoranthus bruhlii* L.M.Copel. as a CRITICALLY ENDANGERED SPECIES in Part 1 of Schedule 1 of the Act. Listing of Critically Endangered species is provided for by Part 4 of the Act.

Summary of Conservation Assessment

Homoranthus bruhlii was found to be eligible for listing as Critically Endangered under Clause 4.5. The main reason for this species being eligible is that the total number of mature individuals is extremely low.

The NSW Threatened Species Scientific Committee has found that:

1. *Homoranthus bruhlii* L.M.Copel. (family Myrtaceae) is the name currently accepted in New South Wales (NSW) for this recently described species.
2. *Homoranthus bruhlii* was first described by Copeland *et al.* (2011) as an “Erect shrub, 0.4–0.7m tall, 0.3–0.6m wide, glabrous. Leaves opposite, decussate, punctate, aromatic, laterally compressed, 7–12mm long, 0.2–0.4mm wide, 0.8–1.3mm thick, linear, mucronate, petiolate, pale green; blade in side view incurved linear to narrow-elliptic; petiole 0.5–0.8mm long. Flowering branchlets undifferentiated, with (2–)3–4 flowers held erect in leaf axils at branchlet apex. Inflorescence a monad; peduncles 0.9–1.3mm long; bracteoles caducous, 4–7mm long, pale yellow–green, slightly glaucous. Hypanthium cylindrical, 5-costate, smooth between the ribs, glabrous, 4.5–6.5mm long, pale yellow–green. Sepals 5, 3–4mm long, pale yellow turning bright red with age, the apex distally lacinate with (2–)3 (–4) slender processes. Petals 5, pale yellow, broadly obovate, obtuse, 2.0–2.5mm long, the margin entire. Stamens 10; filaments ~0.7mm long; anthers globose, basifixed, yellow. Staminodes 10, alternating with the stamens, distinctly adnate to the adjacent antepetalous stamen. Style 8–11mm long, exceeding the hypanthium by 4–6mm at anthesis, minutely hirsute below the papillose stigma, pale yellow. Ovary unilocular; placenta sessile, axile-basal, bearing 7–8(–10) ovules. Fruit a dry, indehiscent nut, brown. *Homoranthus bruhlii* is most similar to *H. elusus* from which it can be distinguished by its thicker leaves (0.8–1.4mm in *H. bruhlii* compared with 0.4–0.8mm in *H. elusus*). Flowers of *H. bruhlii* also have a smooth, glabrous hypanthium that lacks the rounded, multicellular trichomes of *H. elusus*. *H. bruhlii* is also similar to *H. croftianus* but that species has conspicuous, thin, unicellular trichomes between the hypanthium costae.”
3. The species is endemic to NSW and is known only from a single population occurring on rocky outcrops on private land c. 10 km west of Tenterfield. The entire population is confined to a single patch of < 1ha (Copeland *et al.* 2011) despite the presence of several hectares of apparently suitable habitat in the immediate area and other apparently suitable habitat in the nearby Doctors Nose Nature Reserve. Botanical surveys in two nearby Nature Reserves on similar geological substrates did not identify the species as present there.
4. The population size of the species is considered to be extremely low and was estimated in 2011 to be approximately 20 plants (Copeland *et al.* 2011).
5. The known population of *Homoranthus bruhlii* occurs in skeletal, sandy soils among crevices of a granite outcrop. Associated species include *Eucalyptus campanulata*, *E. scoparia*, *Boronia ledifolia* s.l., *Hibbertia acicularis* s.l. and *Lomandra longifolia*. Flowers have been recorded in October and November, with fruits forming shortly afterwards (Copeland *et al.* 2011).

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6. Very little is known about the ecology of the species, however, like other species in the genus *Homoranthus*, it is believed to be an obligate seeder killed by fire and relying on soil-stored seed banks for regeneration. Seeds are likely to require fire-related cues for germination.
7. Potential threats to *H. bruhlii* include stochastic events given the very low population size, browsing by feral goats and fire regimes which inhibit recruitment (too frequent or too infrequent fires).
8. *Homoranthus bruhlii* L.M.Copel. is eligible to be listed as a Critically Endangered species as, in the opinion of the NSW Threatened Species Scientific Committee, it is facing an extremely high risk of extinction in Australia in the immediate future as determined in accordance with the following criteria as prescribed by the *Biodiversity Conservation Regulation 2017*:

Clause 4.2 – Reduction in population size of species

(Equivalent to IUCN criterion A)

Assessment Outcome: Data Deficient.

(1) - The species has undergone or is likely to undergo within a time frame appropriate to the life cycle and habitat characteristics of the taxon:		
(a)	for critically endangered species	a very large reduction in population size, or
(b)	for endangered species	a large reduction in population size, or
(c)	for vulnerable species	a moderate reduction in population size.
(2) - The determination of that criteria is to be based on any of the following:		
(a)	direct observation,	
(b)	an index of abundance appropriate to the taxon,	
(c)	a decline in the geographic distribution or habitat quality,	
(d)	the actual or potential levels of exploitation of the species,	
(e)	the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.	

Clause 4.3 - Restricted geographic distribution of species and other conditions

(Equivalent to IUCN criterion B).

Assessment Outcome: Not Met.

The geographic distribution of the species is:		
(a)	for critically endangered species	very highly restricted, or
(b)	for endangered species	highly restricted, or
(c)	for vulnerable species	moderately restricted.
and at least 2 of the following 3 conditions apply:		
(d)	the population or habitat of the species is severely fragmented or nearly all the mature individuals of the species occur within a small number of locations,	
(e)	there is a projected or continuing decline in any of the following:	
	(i)	an index of abundance appropriate to the taxon,
	(ii)	the geographic distribution of the species,
	(iii)	habitat area, extent or quality,
	(iv)	the number of locations in which the species occurs or of populations of the species.
(f)	extreme fluctuations occur in any of the following:	
	(i)	an index of abundance appropriate to the taxon,
	(ii)	the geographic distribution of the species,
	(iii)	the number of locations in which the species occur or of populations of the species.

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Clause 4.4 - Low numbers of mature individuals of species and other conditions
 (Equivalent to IUCN criterion Clause C)
 Assessment Outcome: Not Met.

The estimated total number of mature individuals of the species is:			
	(a)	for critically endangered species	very low, or
	(b)	for endangered species	low, or
	(c)	for vulnerable species	moderately low.
and either of the following 2 conditions apply:			
	(d)	a continuing decline in the number of mature individuals that is (according to an index of abundance appropriate to the species):	
		(i)	for critically endangered species very large, or
		(ii)	for endangered species large, or
		(iii)	for vulnerable species moderate,
	(e)	both of the following apply:	
		(i)	a continuing decline in the number of mature individuals (according to an index of abundance appropriate to the species), and
		(ii)	at least one of the following applies:
		(A)	the number of individuals in each population of the species is:
			(I) for critically endangered species extremely low, or
			(II) for endangered species very low, or
			(III) for vulnerable species low,
		(B)	all or nearly all mature individuals of the species occur within one population,
		(C)	extreme fluctuations occur in an index of abundance appropriate to the species.

Clause 4.5 - Low total numbers of mature individuals of species
 (Equivalent to IUCN criterion D)
 Assessment Outcome: Critically Endangered under Clause 4.5(a).

The total number of mature individuals of the species is:			
	(a)	for critically endangered species	extremely low, or
	(b)	for endangered species	very low, or
	(c)	for vulnerable species	low.

Clause 4.6 - Quantitative analysis of extinction probability
 (Equivalent to IUCN criterion E)
 Assessment Outcome: Data Deficient

The probability of extinction of the species is estimated to be:			
	(a)	for critically endangered species	extremely high, or
	(b)	for endangered species	very high, or
	(c)	for vulnerable species	high.

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Clause 4.7 – Very highly restricted geographic distribution of species–vulnerable species (Equivalent to IUCN criterion D2)

Assessment Outcome: Vulnerable under Clause 4.7.

For vulnerable species,	the geographic distribution of the species or the number of locations of the species is very highly restricted such that the species is prone to the effects of human activities or stochastic events within a very short time period.
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Dr Anne Kerle
Chairperson
NSW Threatened Species Scientific Committee

Supporting Documentation:

Le Breton T (2019) Conservation Assessment of *Homoranthus bruhlii* L.M.Copel. (Myrtaceae). NSW Threatened Species Scientific Committee.

References:

Copeland LM, Craven LA, Bruhl JJ (2011) A taxonomic review of *Homoranthus* (Myrtaceae: Chamelaucieae). *Australian Systematic Botany* **24**, 351-374. DOI: 10.1071/SB11015