

# NSW Threatened Species Scientific Committee

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## Preliminary Determination

The NSW Threatened Species Scientific Committee, established under the *Biodiversity Conservation Act 2016* (the Act), has made a Preliminary Determination to support a proposal to list the shrub *Homoranthus bebo* 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.

The NSW Threatened Species Scientific Committee has found that:

1. *Homoranthus bebo* L.M.Copel. is endemic to New South Wales (NSW). The risk of extinction of this species has been assessed at the National scale.
2. *Homoranthus bebo* L.M.Copel. (family Myrtaceae) is described as a “Decumbent *shrub*, 0.05–0.2 m tall, 0.5–2 m wide, producing adventitious roots on prostrate branches, glabrous. *Leaves* opposite, decussate, punctate, aromatic, 3–7 mm long, 0.2–0.5 mm wide, 0.5–0.8 mm thick, linear, mucronate, shortly petiolate, shiny, lime-green; blade in side view straight to incurved linear; petiole 0.5–0.8 mm long, slightly glaucous. *Flowering branchlets* undifferentiated, with 3–10 flowers held erect in leaf axils towards branchlet apex. *Inflorescence* a monad; peduncles 0.7–1.7 mm long; bracteoles caducous, 2.0–3.5 mm long, pale purple. *Hypanthium* cylindrical, 5-costate, smooth between the ribs, glabrous, 2.0–3.3 mm long, pale yellow–green. *Sepals* 5, 1.0–2.2 mm long, yellow, the margin entire, the apex long acuminate. *Petals* 5, yellow, broadly obovate, the apex obtuse, 0.5–1.2 mm long, the margin entire. *Stamens* 10; filaments ~0.4 mm long; anthers globose, basifixed, yellow-brown. *Staminodes* 10, alternating with the stamens, distinctly adnate to the adjacent antepetalous stamen. *Style* 6–9 mm long, exceeding the hypanthium by 3–5 mm at anthesis, minutely hirsute below the papillose stigma, yellow. *Ovary* unilocular; placenta sessile, axile-basal, bearing 8–10 ovules. *Fruit* a dry, indehiscent nut, brown.” (Copeland *et al.* 2011).
3. *Homoranthus bebo* is endemic to NSW and currently only known from a single population occurring on the northern edge of Dthinna Dthinnawan Nature Reserve, c. 20 km north-west of Yetman, near the Queensland border (Copeland *et al.* 2011; PlantNET 2017). The population occupies an area of c. 9.3 ha (Hunter 2016). Much of the area surrounding the Reserve has been extensively cleared for grazing. While there is c. 5237 ha of potentially suitable habitat within the Nature Reserve and adjacent Dthinna Dthinnawan National Park, no further individuals have been located (Hunter 2008, 2016).
4. *Homoranthus bebo* occurs on deep sandy soils over sandstone and is associated with Smooth Barked Apple/Black Cypress Woodland (Copeland *et al.* 2011; Hunter 2016). The species is killed by fire and is believed to be an obligate seeder which regenerates from persistent soil stored seed banks, however, post-fire seedling recruitment has not been observed (Hunter 2016). *Homoranthus bebo* does propagate via vegetative reproduction, rooting at nodes along all branches (Hunter 2016) (as occurs in other *Homoranthus* and *Darwinia* species, Briggs 1962, Copeland *et al.* 2011).
5. The geographic distribution of *Homoranthus bebo* is very highly restricted. The extent of occurrence (EOO) and area of occupancy (AOO) are both estimated to be 4 km<sup>2</sup>. The extent of occurrence (EOO) was based on a minimum convex polygon encompassing all known locations, the method for assessing EOO recommended by IUCN (2016). The area of occupancy is based on one 2 x 2 km grid cell, the scale recommended for assessing AOO by IUCN (2016).

# NSW Threatened Species Scientific Committee

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6. The number of mature individuals of *Homoranthus bebo* is difficult to determine as it is believed the species primarily undergoes vegetative reproduction and forms dense clumps, however, estimates based on counts of independent clumps place the number of mature individuals to be between 10,000 and 20,000 (Hunter 2016).
  
7. Inappropriate fire regimes are a significant threat to *Homoranthus bebo*. Recent hazard reduction burns reduced the area occupied by the species by approximately 34%, with an estimated population reduction of 33% (Hunter 2016). In these burns the above ground plant parts were killed, and there was no evidence of post-fire seedling recruitment after 12 months (Hunter 2016), but there may be recruitment at some time in the future. Based on the small area occupied by *H. bebo* and its observed lack of recruitment post-fire, the species could possibly be at an extremely high risk of extinction after even a single moderate severity fire. Other current threats to *H. bebo* include grazing by livestock and feral animals including goats (*Capra hircus*), pigs (*Sus scrofa*) and rabbits (*Oryctolagus cuniculus*), competition with a number of weed species including Coolatai Grass (*Hyparrhenia hirta*), Mother-of-millions (*Bryophyllum delagoense*), Cat's claw creeper (*Dolichandra unguis-cati*), various prickly pear species (*Opuntia* spp.) and Whisky Grass (*Andropogon virginicus*), and disturbance from nearby road or fence maintenance activities (OEH 2014). 'Clearing of native vegetation', 'Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)', 'Competition and habitat degradation by Feral Goats, *Capra hircus* Linnaeus 1758', 'High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition', 'Invasion of native plant communities by exotic perennial grasses', 'Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants', and 'Predation, habitat degradation, competition and disease transmission by Feral Pigs, *Sus scrofa* Linnaeus 1758' are listed as Key Threatening Processes under the Act.
  
8. *Homoranthus bebo* 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 4.3 - Restricted geographic distribution of species and other conditions  
(Equivalent to IUCN criterion B)

<b>The geographic distribution of the species is:</b>			
	(a)	for critically endangered species	very highly restricted, or
<b>and the following conditions apply:</b>			
	(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.	

Dr Marco Duretto  
Chairperson  
NSW Threatened Species Scientific Committee

Exhibition period: 27/04/18 – 22/06/18

# NSW Threatened Species Scientific Committee

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## References:

- Briggs BG (1962) The New South Wales species of *Darwinia*. *Contributions from the New South Wales National Herbarium* **3**, 129–150.
- Copeland LM, Craven LA, Bruhl JJ (2011) A taxonomic review of *Homoranthus* (Myrtaceae: Chamelaucieae). *Australian Systematic Botany* **24**, 351–374.
- Hunter JT (2008) Vegetation and Floristics of Dthiniia Dthinnawan Nature Reserve. Unpublished report for the New South Wales National Parks and Wildlife Service. [ResearchGate. DOI: 10.13140/RG.2.1.4540.2723]
- Hunter JT (2016) Mapping of *Homoranthus bebo* L.M.Copel. Unpublished report for Tenterfield District OEH, NPWS. [ResearchGate. DOI: 10.13140/RG.2.2.26016.17922]
- IUCN Standards and Petitions Subcommittee (2016) Guidelines for Using the IUCN Red List Categories and Criteria. Version 12. Prepared by the Standards and Petitions Subcommittee. <http://www.iucnredlist.org/documents/RedListGuidelines.pdf>
- PlantNET (The NSW Plant Information Network System) Royal Botanic Gardens and Domain Trust, Sydney. <http://plantnet.rbgsyd.nsw.gov.au> (accessed 21 August 2017).