

# NSW Threatened Species Scientific Committee

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## **Notice of the Determination for provisional listing of a critically endangered species on an emergency basis**

The NSW Threatened Species Scientific Committee, established by the *Biodiversity Conservation Act 2016* (the Act), has made a Determination for provisional listing, on an emergency basis, of the tree, *Lenwebbia* sp. Main Range (P.R.Sharpe+ 4877) as a CRITICALLY ENDANGERED SPECIES in Part 1 of Schedule 1 of the Act.

*Lenwebbia* sp. Main Range (P.R.Sharpe+ 4877) (Myrtaceae) is eligible to be provisionally listed in Schedule 1 as a Critically endangered species on an emergency basis as in the opinion of the NSW Threatened Species Scientific Committee (a) the species, although not previously known to have existed in New South Wales, is believed on current knowledge to be native to New South Wales, and is subject to an immediate and significant threat of extinction and (b) the species is not listed in Schedule 1 as an endangered or critically endangered species.

### **What happens next?**

This species will be listed as Critically endangered species when the Provisional Listing Determination is published on the Legislation website [www.legislation.nsw.gov.au](http://www.legislation.nsw.gov.au).

In the near future the Committee will make a Preliminary Determination regarding this proposal which will be place on public exhibition. Public submissions will be invited at that time.

Dr Marco Duretto  
Chairperson  
NSW Threatened Species Scientific Committee

Exhibition period: 09/11/18 – 25/01/19

## Notice of and reasons for the Determination for provisional listing of a critically endangered species on an emergency basis

The NSW Threatened Species Scientific Committee, established under the *Biodiversity Conservation Act 2016* (the Act), has made a Determination for provisional listing, on an emergency basis, of the tree, *Lenwebbia* sp. Main Range (P.R.Sharpe+ 4877) as a CRITICALLY ENDANGERED SPECIES in Part 1 of Schedule 1 of the Act. Provisional Listing of Critically endangered species on an emergency basis is provided for by Part 4 of the Act.

### Summary of Conservation Assessment

*Lenwebbia* sp. Main Range (P.R.Sharpe+ 4877) is eligible for listing as Critically Endangered under Clauses 4.2 (a) (c) (e), 4.4 (a) (d: ii) (e: i,ii) and 4.5 (a) because i) one of the two populations of the species has been observed to be in severe decline due to the impact of a Key Threatening Process (*'Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae'*). This population is highly likely to be reduced in size by 80% over one generation, (ii) the species has an estimated population size of 40 mature individuals and no single population contains more than 30 individuals and several of these have been observed to be subject to severe, continuing decline; and iii) the lower bound for the number of known mature individuals of the species across its range is 25.

The NSW Threatened Species Scientific Committee has found that:

1. *Lenwebbia* sp. Main Range (P.R.Sharpe+ 4877) (family Myrtaceae) is described in PlantNET 2018 as a “small tree to 4 m high; branchlets densely covered with short, ascending fawn hairs. Leaves with lamina elliptical to obovate, usually 3–5 cm long and 10–25 mm wide; secondary venation obscure. Leaves sparingly hairy above with appressed hairs, glabrescent below except on the midvein; apex acute; petiole 3–5.5 mm long. Flowers axillary, solitary; pedicels 6–7 mm long. Hypanthium sparingly hairy. Sepals triangular, obtuse, to 2 mm long. Other details unknown. Mature fruits black.” The species can be distinguished from co-occurring *L. prominens* by the lower surface of the leaves being hairless except for the midvein and the far less prominent lateral veins on the underside of the leaf (Harden *et al.* 2015).
2. *Lenwebbia* sp. Main Range (P.R.Sharpe+ 4877) is currently known to occur in high altitude areas (900-1200 m a.s.l) on, or close to, the New South Wales (NSW) - Queensland (Qld) border. The species occurs on the volcanic escarpments between Wilson’s Peak and Mount Cordeaux, north of Cunningham’s Gap in the Main Range National Park in south-eastern Qld (approximately 50km east of Warwick), and along the border between Limpinwood Nature Reserve (NSW) and Lamington National Park (Qld) on and around Mount Wagawn in suitable habitats on the escarpment to Echo Point.
3. *Lenwebbia* sp. Main Range (P.R.Sharpe+ 4877) is a narrow-ranged endemic which occurs in high altitude vegetation on rocky outcrops along exposed escarpment cliff

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lines and on the wet cliffs or steep slopes immediately below. The substrate is typically skeletal peaty deposits on volcanics (either basalt or rhyolite), with most sites being on south facing, exposed aspects. Suitable habitat for *L. sp. Main Range* (P.R.Sharpe+ 4877) primarily occurs in the following vegetation types: Microphyll Fern Mossy Thickets, Nanophyll Mossy Thickets (Webb 1959). A small number of herbarium collections note the species growing on the margins of Sclerophyll Montane Shrubland. One collection in the Main Range National Park (Qld) notes Complex Notophyll Vine Forest as habitat. *Lenwebbia sp. Main Range* (P.R.Sharpe+ 4877) has been documented occurring in association with *Archirhodomyrtus beckleri*, *Acmena smithii*, *Cassinia compacta*, *Leptospermum petersonii*, *Leucopogon spathaceus*, *Leucopogon sp. Lamington*, *Olearia elliptica*, *Prostanthera ovalifolia*, *Tristaniopsis collina*, *Uromyrtus lamingtonensis* and *Xanthorrhoea latifolia* subsp. *maxima*.

4. *Lenwebbia sp. Main Range* (P.R.Sharpe+ 4877) is a slow growing species, with cultivated specimens taking considerable time to grow both new growth and coppice suckering. The fruit are purple-black and fleshy and contain small, hard seeds like other *Lenwebbia* species (PlantNET 2018). The seeds display a morpho-physiological dormancy which is little understood (G. Phillips *in litt.* May 2018) and it is likely they are dispersed over large distances by vertebrates.
5. The abundance of *Lenwebbia sp. Main Range* (P.R.Sharpe+ 4877) across its range is unknown but is reasonably inferred to be extremely low. Sites surveyed for *L. sp. Main Range* typically contain <10 individuals. The observed number of individuals across the known range of the species is approximately 20-30 in NSW and 5-10 in Qld (G. Phillips *in litt.* May 2018). The abundance of the species could be higher given the extent of extremely remote similar habitat across its range and the difficulty in accurately surveying these areas, but is still reasonably suspected to be <100 individuals. Surveys indicate that, across the several kilometres of escarpment where *L. sp. Main Range* (P.R.Sharpe+ 4877) is found, suitable habitats are highly fragmented and rare (Weber and Box, 2016). Sites in Qld have only ever had single, mature individuals recorded (G. Phillips *in litt.* May 2018). Several seedlings and juvenile plants have been recorded at Echo Point in NSW (Weber and Box 2016).
6. Two populations of *Lenwebbia sp. Main Range* (P.R.Sharpe+ 4877) are currently documented, identified from herbarium specimen data and survey information (G. Phillips *in litt.* May 2018). One population occurs across five sites at a single location in Main Range National Park in Qld. The second population occurs across seven sites at a single location in Limpinwood Nature Reserve-Lamington National Park in NSW. The two populations are isolated from each other by a minimum distance of c. 68 km which severely reduces the likelihood of gene flow.
7. *Lenwebbia sp. Main Range* (P.R.Sharpe+ 4877) has a highly restricted geographic distribution. The extent of occurrence (EOO) is estimated to be 1556 km<sup>2</sup>. The EOO is estimated based on a minimum convex polygon enclosing all mapped and known occurrences of the species, the method of assessment recommended by IUCN (2017). The area of occupancy (AOO) was estimated to be 44 km<sup>2</sup>. This calculation was based on the species occupying 11 (2 x 2 km) grid cells, the spatial scale of assessment recommended by IUCN (2017).

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8. The survival of *Lenwebbia* sp. Main Range (P.R.Sharpe+ 4877) is severely threatened by infection from the exotic rust fungus *Austropuccinia psidii* (myrtle rust). The '*Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae*' is listed as a Key Threatening Process under the Act. *Austropuccinia psidii* was first detected in Australia on the NSW Central Coast in April 2010 and has since established in natural ecosystems throughout coastal NSW, south-east Qld and far north Qld (Carnegie and Lidbetter 2012; Pegg *et al.* 2014). *Austropuccinia psidii* also has a limited distribution in Victoria, Tasmania and the Northern Territory (Carnegie *et al.* 2016).
9. Species in the genus *Lenwebbia* are known hosts of *Austropuccinia psidii* (Zauza *et al.* 2010) and are characterised as both 'Highly Susceptible' (*L. prominens*) to 'Relatively Tolerant' (*L. lasioclada*, *L.* sp. Blackall Range (P.R.Sharpe+ 5387)) to *A. psidii* infection (Pegg *et al.* 2014). Plants have been documented as being affected by *A. psidii* infection by botanists surveying *L.* sp. Main Range (P.R.Sharpe+ 4877) populations (Weber and Box, 2016).
10. Infection by the rust-fungus *Austropuccinia psidii* has led to a rapid decline of the population of *L.* sp. Main Range (P.R.Sharpe+ 4877) in Limpinwood Nature Reserve-Lamington National Park between botanical surveys in 2013, 2016 and 2018. It is reasonably suspected that this population will continue to decline rapidly as a consequence of infection by *A. psidii*. Surveys of populations in the Main Range National Park Qld are required to assess decline; this population has not been surveyed since 1994.
11. Substantial declines resulting from myrtle rust infection in the Limpinwood Nature Reserve-Lamington National Park population of *Lenwebbia* sp. Main Range (P.R.Sharpe+ 4877) have been documented over a short period of time relative to the generation length of the species (i.e. 90% mortality or serious defoliation over a period of 2 years between 2016-2018). The generation length of *L.* sp. Main Range (P.R.Sharpe+ 4877) is inferred to be 45 years based on conservative estimates of its life span (up to 100 years) and observations of growth rate in cultivated specimens (at least 20 years to flower and fruit) (G. Phillips *in litt* May 2018).
12. Under these reported rates of decline in one of the two only known populations of *L.* sp. Main Range (P.R.Sharpe+ 4877) it is reasonably suspected that it may undergo a 90-100% reduction in size within one generation. If this population declines to extinction, which is reasonably inferred from observations, this could result in an overall reduction of known individuals of *L.* sp. Main Range (P.R.Sharpe+ 4877) by approximately 75% (provided the Main Range National Park population is not suffering similar decline). The AOO and EOO of *L.* sp. Main Range (P.R.Sharpe+ 4877) may also undergo dramatic decline within one generation. Extinction of the Limpinwood Nature Reserve-Lamington National Park population would result in a reduction in EOO of up to 1400km<sup>2</sup> (92%) and in AOO of up to 16km<sup>2</sup> (36%).

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13. No effective or practical chemical, biological or management control is currently available for protecting populations of *Lenwebbia* sp. Main Range (P.R.Sharpe+ 4877) in natural ecosystems from *Austropuccinia psidii* infection. Repeated monthly application of registered fungicides (e.g. triadimenol) for extremely high value assets concentrated in small local areas may be feasible but is impractical for widespread control. Where triadimenol has been used in experimental trials of *A. psidii* control in natural populations of other myrtaceous species, applications repeated at longer than a monthly interval did not control infection (Carnegie *et al.* 2016). Whilst some biological control agents have been trialled to control *A. psidii* in *Eucalyptus* plantations overseas the likelihood that these controls will become viable options for eradication in Australia in the time frame relevant to the regeneration capacity of *L.* sp. Main Range (P.R.Sharpe+ 4877) is negligible (Glen *et al.* 2007). In the absence of an effective control strategy for *A. psidii* further rapid reductions of *L.* sp. Main Range (P.R.Sharpe+ 4877) populations are highly likely.
14. The ubiquity of susceptible species in the family Myrtaceae in the Australian landscape makes broad-scale eradication or containment of *Austropuccinia psidii* unlikely (Glen *et al.* 2007). The predominantly airborne nature of the rust spores and inadvertent dispersal by human activity (Carnegie and Cooper 2011) infers that *Lenwebbia* sp. Main Range (P.R.Sharpe+ 4877) populations and individuals in conservation reserves may be no more secure than any other land tenure. It is expected that surviving plants and populations of *L.* sp. Main Range (P.R.Sharpe+ 4877) will continue to be subject to a significant spore load, whether as wind-borne spores or by other vectors. This continued exposure severely reduces the likelihood of population recovery in *L.* sp. Main Range (P.R.Sharpe+ 4877).
15. No adequate *ex-situ* collections of *Lenwebbia* sp. Main Range (P.R.Sharpe+ 4877) material exist (G. Phillips *in litt.* May 2018). There are no current holdings of wild-collected seed at the NSW Seedbank (Australian Botanic Garden, Mount Annan NSW) and myrtaceous species from rainforest environments are characterised by seeds which are desiccation-intolerant and, therefore, not suited to long-term conservation storage (Sommerville and Offord 2014). Remaining healthy branches were sampled from the Limpinwood Nature Reserve-Lamington National Park population in 2018 for tissue culture collections which are currently held within the NSW PlantBank (Australian Botanic Garden, Mount Annan NSW).
16. Individual plants of *Lenwebbia* sp. Main Range (P.R.Sharpe+ 4877) in the Limpinwood Nature Reserve-Lamington National Park population are threatened by trampling from park visitors. Trampling of individuals has been observed on juvenile plants at Echo Point Lookout causing minor damage (G. Phillips *in litt.* May 2018).
17. The long-term persistence of *Lenwebbia* sp. Main Range (P.R.Sharpe+ 4877) is threatened by the impact of climate change on temperature and rainfall patterns across its habitat. 'Anthropogenic Climate Change' is listed as a Key Threatening Process under the NSW Biodiversity Conservation Act (listed 3/11/2000). Climate change has the potential to reduce the extent of the very restricted damp environments in which *L.* sp. Main Range occurs. Projected changes in the amount of rainfall or increase in damaging storm activity has the potential to adversely alter

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the habitat available to the *Lenwebbia* sp. Main Range at all known locations where it occurs (Whetton 2015).

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