NSW SCIENTIFIC COMMITTEE

Final Determination

The Scientific Committee, established by the *Threatened Species Conservation Act 1995* (the Act), has made a Final Determination to list the shrub *Phebalium speciosum* I.Telford as a CRITICALLY ENDANGERED SPECIES in Part 1 of Schedule 1A of the Act. Listing of Critically Endangered species is provided for by Part 2 of the Act.

The Scientific Committee has found that:

1. *Phebalium speciosum* I.Telford (family Rutaceae) is described in Telford (2013) as a "shrub to 3 m tall. Branchlets ferruginous lepidote. Leaves with petioles 3–4.7 mm long, channelled above, silver and ferruginous lepidote; lamina lanceolate or narrowly elliptical, 25–84 mm long, 7.5–22 mm wide, obtuse; margin undulate, slightly recurved; adaxial surface dark green, silvery stellate, becoming minutely papillose by erosion of hair branches, the midvein deeply impressed; adaxial surface silvery and ferruginous lepidote. Inflorescences terminal, sessile umbels of 4–8 flowers; pedicels 7.5–10 mm long; slightly thickening distally, ferruginous lepidote. Calyx cup-shaped with 6–8 lobes, silvery and ferruginous lepidote outside, silvery lepidote inside; cup c.2 mm long, 4.2–4.8 mm diam.; lobes erect, triangular, 2.2–3 mm long, acute. Corolla 6–8 petals, of which 4 adjacent spreading, the other 2–4 more or less erect, clawed; claw 1.5–2 mm long, glabrous, white to pale pink lamina obovate or elliptical, 8.4–10.2 mm long, 3.2–5 mm wide, shortly acuminate, margin minutely crenulate; adaxial surface glabrous, deep pink paling with age; adaxial surface silvery and ferruginous lepidote with a glabrous marginal band. Stamens 12–14, inclined over the 4 spreading petals; filaments filiform, 6.5–11 mm long, glabrous, pink; anthers oblong, 1.7–2.5 mm long, yellow. Ovary subglobose, 2–3 mm diam., of 6 or 7 free carpels; carpels 2–2.3 mm long, ferruginous lepidote; style 5–5.5 mm long, glabrous, recurved above stamens; stigma capitate, minutely papillose. Cocci ellipsoidal, 4–4.2 mm long, 2.4–3.2 mm wide, ferruginous lepidote. Seeds ellipsoidal, 2.6–3 mm long, 1.2–1.6 mm wide, longitudinally striate, black."

2. *Phebalium speciosum* is endemic to New South Wales (NSW) and is currently known to occur at Battery Hill and Cullawajune Mountain, approximately 80 km west northwest of Lismore, in northeastern NSW. These two mountains are acid volcanic plugs and are part of the band of volcanic outcrops of the McPherson Range and adjacent areas between Boonah in Queensland and Woodenbong and Urbenville in NSW (Telford 2013). *Phebalium speciosum* grows at the base of the acid volcanic outcrops, on the steeper midslopes on skeletal clay-loam soils, and also on top of the escarpment among rocks at 350–450 m altitude (A. Goodwin *in litt.* April 2015). *Phebalium speciosum* occurs in open forest or heath along with *Eucalyptus microcorys, Corymbia intermedia, Allocasuarina littoralis, Bossiaea rupicola* and *Leptospermum polygalifolium* (Telford 2013).

3. There are currently two known populations of *Phebalium speciosum*. The population at Battery Hill is within Yabbra State Forest. Much of the flat country of the State Forest is under pine plantation but the outcrop of Battery Hill is native vegetation. Based on an informal count of individuals growing on the slopes and summit of Battery Hill, there are at least 1,000 plants in this population. Approximately 10% of these (or less) were juveniles or seedlings at the time of the census and the majority of these were located in the disturbed area near the road at the base of the mountain (A. Goodwin *in litt.* April 2015). No comprehensive count of the population at Cullawajune Mountain has been completed, however Telford (2013) recorded approximately 250 plants in an undisturbed rocky gully on the mountain. Further surveys are required to determine the extent of the population over the rest of the mountain. The majority of *P. speciosum* habitat on Cullawajune Mountain falls within Yabbra National Park, with pine plantations in Yabbra State Forest bordering the north, northwest and eastern boundaries of the National Park.

4. The geographic distribution of *Phebalium speciosum* is very highly restricted. The extent of occurrence and area of occupancy (AOO) were both estimated to be 8 km^2. The AOO is based on 2 x 2 km grid cells, the scale recommended for assessing area of occupancy by IUCN (2014).

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5. A number of threats to *Phebalium speciosum* and its habitat have been identified (A. Goodwin *in litt.* April 2015). The main threat is the invasion of the habitat by the weeds *Lantana camara* (Lantana) and *Ligustrum sinense* (Small-leaved Privet), that compete with juvenile *P. speciosum* for light and nutrients. Both weed species are also less flammable than native shrubs and may potentially alter the fire regime of the habitat by limiting the spread of fire in low-moderate fire weather conditions. Other weed species present include *Pinus* sp. (Pine), *Solanum mauritianum* (Wild Tobacco), *Ageratina adenophora* (Crofton), *Sporobolus fertilis* (Giant Parramatta Grass), *Passiflora subpeltata* (White Passionfruit), *Passiflora edulis* (Passionfruit), *Ambrosia* sp. (Ragweed), *Bidens pilosa* (Farmers Friend), *Paspalum mandiocanum* (Broad-leaved Paspalum) and *Cinnamomum camphora* (Camphor Laurel). The proximity of the exotic pine plantations to both populations of *P. speciosum* poses a number of threats. A pine plantation perimeter road cuts through part of one population of *P. speciosum* and may result in disturbance from road maintenance operations. Other threats associated with the pine plantations include changes in soil pH, herbicide spray drift and pine wildings encroaching into the population. The Battery Hill population is close to cliffs that are frequented by rock climbers. This has led to walking tracks through the middle of the site and some trampling of *P. speciosum* plants (A. Goodwin *in litt.* April 2015; Telford 2013). 'Invasion, establishment and spread of Lantana (*Lantana camara* L. *sens. lat*)'; and the 'Invasion of native plant communities by exotic perennial grasses' are listed as Key Threatening Processes under the Act.

6. *Phebalium speciosum* I.Telford is eligible to be listed as a Critically Endangered species as, in the opinion of the Scientific Committee, it is facing an extremely high risk of extinction in New South Wales in the immediate future as determined in accordance with the following criteria as prescribed by the *Threatened Species Conservation Regulation 2010*:

Clause 7 Restricted geographic distribution and other conditions
The geographic distribution of the species is estimated or inferred to be:
(a) very highly restricted,
and:
(d) a projected or continuing decline is observed, estimated or inferred in the key indicator:
(b) the geographic distribution, habitat quality or diversity, or genetic diversity of the species.

Dr Mark Eldridge
Chairperson
NSW Scientific Committee

Exhibition period: 16/12/16 – 10/02/17 Proposed Gazettal date: 16/12/16

References:

Telford IRH (2013) *Phebalium speciosum* (Rutaceae: Boronieae), an endangered, narrowly endemic new species of north-eastern New South Wales, Australia. *Telopea* **15**, 51–55.

IUCN Standards and Petitions Subcommittee (2014) Guidelines for Using the IUCN Red List Categories and Criteria. Version 11. Prepared by the Standards and Petitions Subcommittee. http://www.iucnredlist.org/documents/RedListGuidelines.pdf

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