

NSW SCIENTIFIC COMMITTEE

Preliminary Determination

The Scientific Committee, established by the Threatened Species Conservation Act, has made a Preliminary Determination to support a proposal to list the tree, *Eucalyptus macarthurii* H.Deane & Maiden as an ENDANGERED SPECIES in Part 1 of Schedule 1 of the Act, and as a consequence, to omit reference to *Eucalyptus macarthurii* H.Deane & Maiden from Part 1 of Schedule 2 (Vulnerable species) of the Act. Listing of Endangered species is provided for by Part 2 of the Act.

The Scientific Committee has found that:

1. *Eucalyptus macarthurii* H.Deane & Maiden (family Myrtaceae) (Camden Woollybutt, Paddy's River Box) is described by Hill (2002) as a "Tree to 40 m high with bark persistent on trunk and larger branches, grey-brown, shortly fibrous, thick, smooth above, grey, shedding in short ribbons. Juvenile leaves opposite, ovate to broad-lanceolate, cordate, dull green. Adult leaves disjunct, narrow-lanceolate, 8-16 cm long, 0.8-1.5 cm wide, green, dull, concolorous. Umbellasters 7-flowered; peduncle narrowly flattened or angular, 2-9 mm long; pedicels terete, 1-2 mm long. Buds ovoid or fusiform, 3-5 mm long, 2-3 mm diam., scar present; calyptra hemispherical or conical, shorter than or as long as and as wide as hypanthium. Fruit hemispherical, conical or campanulate, 3-5 mm long, 3-6 mm diam.; disc raised; valves exerted.' This species can be mistaken at some growth stages for *E. aggregata*, *E. smithii* or *E. radiata* when not in flower. The population of *E. macarthurii* in Kanangra Boyd National Park is not typical, having larger fruit up to 7 mm diameter and large juvenile leaves, but recognition of this population as a separate taxon is unlikely (Klaphake 2010; S. Douglas pers. comm. June 2013).
2. *Eucalyptus macarthurii* is currently listed as a Vulnerable species in Part 1 of Schedule 2 of the Act and is endemic in New South Wales. It predominately occurs in the Sydney Basin and South Eastern Highlands Bioregions (*sensu* Thackway & Cresswell 1995) and has a naturally disjunct distribution across the Southern-Central Tablelands from the Blue Mountains to near Goulburn (Brooker & Kleinig 1999). The two main occurrences of this species are in the Southern Highlands (Wingecarribee Plateau and environs extending south to the far north of the Southern Tablelands at Marulan), and the Boyd Plateau in the southern Blue Mountains region. These two populations are morphologically distinct (Klaphake 2010), and occur on different substrates. In both locations this species is found on flats and near swamps and streams, growing at moderately high altitudes and favouring cold, wet locations (Black 1982). The Boyd Plateau is 1000-1200 m asl (Black 1982) whereas in the Southern Highlands this species can be found as low as 700 m asl (Benson & McDougall 1998).
3. The extent of occurrence (EOO) for *Eucalyptus macarthurii* is approx. 2390 km² based on records from the Atlas of Living Australia using a minimum convex polygon as recommended by IUCN (2011). This estimate excludes records collected at Abercrombie Caves Reserve, Tumut, Queanbeyan and Marulan which are thought to be from planted individuals rather than from natural populations or which are mis-identifications (S. Douglas, pers. comm. 15 Oct 2012). The area of occupancy (AOO) is approx. 212 km² using 2 x 2 km grid cells, the scale recommended for assessing area of occupancy by the IUCN (2011). Thus the distribution of *E. macarthurii* is considered to be highly restricted.

NSW SCIENTIFIC COMMITTEE

4. Limited information on the number and size of *Eucalyptus macarthurii* populations is available. At least 1200 trees are thought to occur in the Kanangra-Boyd National Park with approx. 1100 trees distributed across the Southern Tablelands. The total population is likely to be less than 10,000 plants (S. Douglas *in litt.* 2011). In the Southern Highlands, *E. macarthurii* often occurs as scattered paddock trees in grazed pastures where little opportunity for regeneration exists (NSW NPWS *in litt.* 2004), or as small stands or small linear remnants along roads or drainage lines (S. Douglas *in litt.* 2011). Some larger populations of *E. macarthurii* do occur in this region including a small population in the Cecil Hoskins Nature Reserve between Moss Vale and Bowral (NSW NPWS 1999; Norton & Burton 2000), Stingray Swamp Flora Reserve within the Penrose State Forest, along the lower Paddys River and along the Wingecarribee River in West Berrima (S. Douglas *in litt.* 2011). While the likelihood for regeneration of paddock trees is low, significant natural regeneration has occurred in the Cecil Hopkins Reserve which has been augmented by plantings within the Old Bowral Airfield (NSW NPWS 1999; Norton & Burton 2000; Stone 1993). In the Boyd Plateau the species is described as scattered or as occurring in isolated stands (NSW NPWS 2001). While most of the *Eucalyptus macarthurii* population on the Boyd Plateau is conserved in the Kanangra-Boyd National Park, this species is poorly represented in conservation estates across the Southern Highlands. Some planting of *E. macarthurii* for windbreaks has also occurred within the Southern Highlands, although this is not a species commonly planted for this purpose (S. Douglas pers. com. June 2013).
5. Detailed historical information about the distribution of *Eucalyptus macarthurii* is extremely limited, making it difficult to directly assess decline for this species. While the species is not believed to have undergone significant range contraction, it is considered to have been severely depleted at the core of its range in the Southern Highlands (Benson & McDougall 1998). The decline of *E. macarthurii* can be indirectly inferred through information regarding the ecological communities in which it occurs. *E. macarthurii* occasionally occurs in Southern Highlands Shale Woodlands (Fisher *et al.* 1995) and the Southern Highlands Shale Woodlands in the Sydney Basin Bioregion is listed as an Endangered Ecological Community under the NSW *Threatened Species Conservation Act* 1995. This community has been extensively cleared for agricultural and rural development such that an estimated 2000 ha (<5%) of the original extent remains, much of this in scattered patches of <5 ha (Eco Logical Australia 2010). This suggests that *E. macarthurii* has experienced a similar decline. *Eucalyptus macarthurii* is also found in or adjoining two other communities listed under the *Threatened Species Conservation Act* 1995 - the Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW Western Slopes Bioregions which is estimated to have declined by 72% since European settlement (Tozer *et al.* 2011), and the Montane Peatlands & Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps Bioregions community, which has declined by >75% in the far southeast of its range (Keith & Bedward 1999). *Eucalyptus macarthurii* is also found in the Temperate Highland Peat Swamps on Sandstone community which is listed under the *Environmental Protection and Biodiversity Conservation Act* 1999. Although *E. macarthurii* may have once been more common within these communities, it is now rare or absent from many remnants (S. Douglas pers. comm. June 2013). Collectively, the broadscale loss of the ecological communities in which *E. macarthurii* is found is likely to have contributed to the decline of this species.

NSW SCIENTIFIC COMMITTEE

6. Land clearing and land use intensification represent a significant threat to *Eucalyptus macarthurii* in the Southern Highlands through the destruction of trees and removal or alteration of suitable habitat. Weed invasion is a threat primarily in the Southern Highlands and known weed incursions in the Penrose State Forest/Stingray Swamp Flora Reserve include pines (*Pinus* spp.), blackberry (*Rubus* spp.) and Japanese honeysuckle (*Lonicera japonica*) (Douglas & Robyn 2010). Blackberry is also a significant weed in the Cecil Hoskins Nature Reserve (NSW NPWS 1999). A lack of regeneration through grazing is also a major threat to the persistence of this species (NSW NPWS *in litt.* 2004). The species is potentially vulnerable to exotic rust pathogens known to affect members of the family Myrtaceae which has been recorded in the Blue Mountains and Wingecarribee Local Government Areas (http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0007/426904/Distribution-of-myrtle-rust-by-lga-in-nsw-as-at-jan-2012.pdf, accessed 25 March 2013). *Eucalyptus macarthurii* is also found at higher elevations (700-1200 m) and in wetter habitats (Black 1982) and predicted temperature increases and rainfall reductions for the Southern Highlands Shale Woodlands suggest that this community may be vulnerable to climate change (Eco Logical Australia 2010). 'Clearing of native vegetation', 'Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae', 'Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants' and 'Anthropogenic Climate Change' are listed as Key Threatening Processes under the *Threatened Species Conservation Act 1995*.
7. *Eucalyptus macarthurii* H.Deane & Maiden is not eligible to be listed as a Critically Endangered species.
8. *Eucalyptus macarthurii* H.Deane & Maiden is eligible to be listed as an Endangered species as, in the opinion of the Scientific Committee, it is facing a very high risk of extinction in New South Wales in the near 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:

(b) highly restricted,

and:

- (d) a projected or continuing decline is observed, estimated or inferred in either of the key indicators:
- (a) an index of abundance appropriate to the taxon, or
 - (b) the geographic distribution, habitat quality or diversity, or genetic diversity.

Associate Professor Michelle Leishman
Chairperson
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Proposed Gazettal date: 20/12/13
Exhibition period: 20/12/13 – 14/03/14

NSW SCIENTIFIC COMMITTEE

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NSW SCIENTIFIC COMMITTEE

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