NSW SCIENTIFIC COMMITTEE

Final Determination

The Scientific Committee, established by the Threatened Species Conservation Act, has made a Final Determination to list a population of the tree *Eucalyptus aggregata* H.Deane & Maiden in the Wingecarribee local government area as an ENDANGERED POPULATION in Part 2 of Schedule 1 of the Act. Listing of Endangered populations is provided for by Part 2 of the Act.

1. *Eucalyptus aggregata* H.Deane & Maiden (family Myrtaceae), also known as Black Gum, is described by Hill (2002) as: 'Tree to 18 m high; bark persistent, grey to grey-black, fibrous-flaky, throughout. Juvenile leaves opposite or disjunct, elliptic or ovate to broad-lanceolate, dull green. Adult leaves disjunct, narrow-lanceolate to lanceolate, 5-12 cm long, 1-2 cm wide, green, glossy, concolorous. Umbellasters 7-flowered; peduncle terete, 3-4 mm long; pedicels terete, 0-2 mm long. Buds ovoid, 3-5 mm long, 2-3 mm diam., scar present; calyptra hemispherical or conical, shorter than to as long as and as wide as hypanthium. Fruit conical to hemispherical, 2-4 mm long, 3-5 mm diam.; disk flat or raised; valves exserted.'

2. *Eucalyptus aggregata* is not currently listed as an Endangered species in Part 1 of Schedule 1 or as a Critically Endangered species in Part 1 of Schedule 1A and as a consequence populations of this species are eligible to be listed as Endangered populations under the *Threatened Species Conservation Act* 1995.

3. *Eucalyptus aggregata* is currently listed as a Vulnerable species in Part 1 of Schedule 2 of the Act. It occurs on the Central and Southern Tablelands of NSW (Brooker & Kleinig, 1999, Hill 2002) with an unconfirmed outlier on the Northern Tablelands. Three small disjunct populations also occur in Victoria (Brooker & Kleinig, 1999). In NSW, the geographic distribution of *E. aggregata* is moderately restricted and predominantly occurs in the South Eastern Highlands Bioregion (*sensu* Thackway & Cresswell 1995). The most easterly occurrence of *E. aggregata* is located in the Wingecarribee local government area. The *Eucalyptus aggregata* population in the Wingecarribee local government area is isolated from core *E. aggregata* populations on the Southern and Central Tablelands and comprises the bulk of the species' occurrence in the Sydney Basin Bioregion. A record of *E. aggregata* near Kangaloon also exists, however two recent surveys have failed to locate the species at this site and hence it is presumed extinct at this site (S. Douglas *in litt*. Sept 2011). A small stand of *E. aggregata* is reported from near Marulan, just south of the Wingecarribee local government area (S. Douglas *in litt*. Sept 2012; G. Stone *in litt*. Nov 2012), but is not considered part of this population in the Wingecarribee local government area. The extent of occurrence for the *Eucalyptus aggregata* population in Wingecarribee local government area is estimated to be 16 km^2 based on the IUCN Guidelines (2011). The area of occupancy was estimated to be 16 km^2, equivalent to 4 (2km x 2km) km grids covering the known sites in the Wingecarribee local government area, the spatial scale recommended for assessing areas of occupancy by IUCN (2011). The geographic distribution of this population is therefore considered to be highly restricted.

4. The *Eucalyptus aggregata* population in the Wingecarribee local government area is estimated to be fewer than 100 plants in three subpopulations. A survey by Field (2008) found 35 adult trees at Berrima and 15 adults, three juveniles and three seedlings at Medway while 14 adults and two juveniles have been recorded at Sutton Forest. There appear to be few opportunities for regeneration within the Berrima subpopulation (D. Field

Contact Address: C/o PO Box 1967 Hurstville BC NSW 1481 Telephone: (02) 9585 6940 Facsimile: (02) 9585 6606

in litt. July 2011). Given the special separation of the three subpopulations the extent of habitat clearing and land conversion for other uses near this population, it is unlikely that any additional substantial populations will be located near to this one. The population is therefore considered to be severely fragmented.

5. The *Eucalyptus aggregata* population in the Wingecarribee local government area has significant conservation value as it occurs in an area of higher rainfall (~1800 mm pa) relative to much of the remainder of the species' range. Although the genetic distinctiveness of the *Eucalyptus aggregata* population in the Wingecarribee local government area is unknown, this population is at the eastern edge of the species range and may be an important source of genetic variation for the species as well as an important seed source for future regeneration (D. Field, pers. comm. July 2011). This population is also relatively isolated with the nearest populations ranging from 30 km south near Marulan (G. Stone *in litt*. Nov 2012) to 50 km away on the Taralga Road (D. Field, *in litt*. July 2011). Current estimates of pollen movement for eucalypts are <1 km with rare events >5 km (Potts *et al.* 2003). Seed are predicted to be dispersed over distances of 300 m at best (Wallace & Trueman 1995), suggesting that this population is unlikely to interact with other *E. aggregata* populations. This isolation is likely to be reinforced by relatively small foraging distances of insects such as introduced Honeybee (*Apis mellifera*), native bees and Christmas beetle (*Anoplognathus suturalis*) that have been noted foraging on *E. aggregata* (Field 2008). Being disjunct from the main core of *E. aggregata* populations, the *Eucalyptus aggregata* population in the Wingecarribee local government area is therefore considered to be disjunct.

6. The *Eucalyptus aggregata* population in the Wingecarribee local government area has been recorded in or adjoining two communities listed as threatened 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 South Western Slopes Bioregions, and the Southern Highlands Shale Woodlands in the Sydney Basin Bioregion.

7. Threats to the *Eucalyptus aggregata* population in the Wingecarribee local government area are similar to those present for *E. aggregata* as a species. This population is small (<100 plants), subdivided (three subpopulations), isolated, and has a history of fragmentation associated with land clearing. 'Clearing of native vegetation' is listed as a Key Threatening Process under the *Threatened Species Conservation Act* 1995. Weed invasion is also severe at Sutton Forest, particularly by Hawthorn (*Crataegus monogyna*) and grasses such as *Phalaris* spp., Cocksfoot (*Dactylis glomerata*) and Yorkshire Fog (*Holcus lanatus*). 'Loss and degradation of native plant and animal habitat by invasion of escaped gardens plants, including aquatic plants' and 'Invasion of native plant communities by exotic perennial grasses' are listed as Key Threatening Processes under the *Threatened Species Conservation Act* 1995. Other threats include changing rural and semi-rural land use and urban expansion. The Berrima and Medway subpopulations also occur on private land used for grazing. Hybridisation leading to genetic swamping is another risk for *E. aggregata*, particularly when numbers of this species are proportionally lower than those of other co-occurring *Eucalyptus* species such as *E. viminalis* and *E. rubida*. This can lead to the increased production of hybrids and introgression resulting in reduced seed production, germination and survivorship of seed cohorts (Field 2008). In addition, the effects of climate change may reduce conditions suitable for the recruitment and establishment of *E. aggregata* seedlings and favour establishment by other co-

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occurring eucalypt species, such as *E. rubida* and *E. viminalis*, from surrounding forests and woodlands (S. Douglas *in litt*. July 2008).

8. None of the individuals or subpopulations in the *Eucalyptus aggregata* population in the Wingecarribee local government area are known to occur in conservation reserves.

9. The population of *Eucalyptus aggregata* H.Deane & Maiden in the Wingecarribee local government area is eligible to be listed as an Endangered population 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 11 Criteria for listing determinations by Scientific Committee
The population is facing a very high risk of extinction in New South Wales in the near future as, in the opinion of the Scientific Committee, it satisfies any one or more of the following paragraphs and also meets the criteria specified in one or more of the following clauses:

(a) it is disjunct or near the limit of its geographic range,

(c) it is otherwise of significant conservation value.

Clause 13 Highly restricted geographic distribution of population and other conditions
The geographic distribution of the population is estimated or inferred to be highly restricted and either:

(a) 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, or

(b) the following conditions apply:

  (i) the population or habitat is observed or inferred to be severely fragmented;

  (ii) all or nearly all mature individuals are observed or inferred to occur within a small number of locations.

Clause 14 Low numbers of mature individual in population and other conditions
The estimated total number of mature individuals in the population is low and either:

(a) 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, or

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(b) the following conditions apply:

(i) the population or habitat is observed or inferred to be severely fragmented,

(ii) all or nearly all mature individuals are observed or inferred to occur within a small number of locations.

Clause 15 Very low numbers of mature individuals in population
The estimated total number of mature individuals of the population is observed, Estimated or inferred to be very low.

Associate Professor Michelle Leishman
Chairperson
Scientific Committee

Reference:

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