NSW SCIENTIFIC COMMITTEE

***Eucalyptus recurva* Crisp (Myrtaceae)**

Review of Current Information in NSW

June 2008

Current status:

Eucalyptus recurva currently is listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). The NSW Scientific Committee recently determined that *Eucalyptus recurva* meets criteria for listing as Critically Endangered in NSW under the *Threatened Species Conservation Act* 1995 (TSC Act), based on information contained in this report and other information available for the species.

Species description:

Eucalyptus recurva is described in Hill (2002) as follows: "Mallee to 1.5 m high; bark smooth, grey, orange, green or yellow, shedding in long ribbons. Juvenile leaves opposite, elliptic to ovate, glossy green. Adult leaves opposite, elliptic or ovate, 1–3 cm long, 0.5–0.8 cm wide, green, glossy, concolorous. Umbellasters 3-flowered; peduncle narrowly flattened or angular, 3–5 mm long; pedicels terete, 1–2 mm long. Buds ovoid, 4–5 mm long, 3–4 mm diam., scar present, but outer calyptra not shedding cleanly; calyptra hemispherical, shorter and narrower than hypanthium. Fruit hemispherical or conical, 3–4 mm long, 4–5 mm diam.; disc raised; valves enclosed to rim-level."

Taxonomy:

Eucalyptus recurva was described by Crisp (1988) who found it taxonomically well distinguished from any known species, but closest to *E. vernicosa*.

Distribution and number of populations:

The Mongarlowe Mallee is confined to the NSW Southern Tablelands where it is known from only four stands. Three of these occur near Mongarlowe (with at least two kilometres separating each of the sites) and the fourth is about 30 km away, near Windellama (Figure 1). These four sites represent separate locations and subpopulations. There are two plants near Windellama, located 40 m apart and it is has been suggested that they could be identical genotypes that originated from a common rootstock that separated and spread in different directions (NSW NPWS 2003).

The first botanical specimen of this species was collected from the Mongarlowe area in August 1985. In 1990 another stand in the Mongarlowe area was discovered. The Windellama plants were discovered in 1994 and 2001. A helicopter survey of potential habitat was undertaken in January 2001 to locate other potential individuals of the species. This resulted in discovery of one new plant near Mongarlowe.

It is likely that these individuals represent a relict of a more widespread ancestor, and it is unlikely that further extensive populations of the species remain undiscovered.

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Three of the known sites are on privately owned land. The fourth is on freehold land owned by a company. This species has never been recorded in any conservation reserves (NSW NPWS 2003).

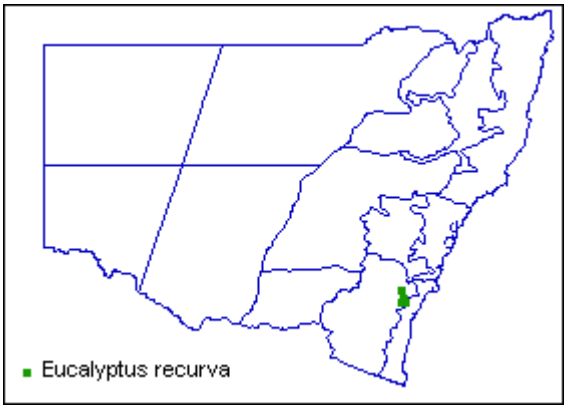

Figure 1. Location of *Eucalyptus recurva* in NSW.

Ecology:

Key habitat requirements

Eucalyptus recurva occurs in low heathland, or on the margins of eucalypt woodland and heathland, on skeletal soil on quartzite slopes (Hill 1991). The soil is shallow, pale-grey sandy loam overlaying white or grey clay.

Life history

Like most species of eucalypts, *E. recurva* is likely to be insect pollinated. Several species of flying insects have been observed during the January flowering period (NSW NPWS 2003).

This species has been found to set very few seeds (about 0.6 viable seeds per capsule), and no seedling establishment has been observed at any of the known sites (NSW NPWS 2003). Therefore, the chance of recruitment of new individuals in the field is low. The lack of seed set could be due to the individuals being physically too far apart for transfer of pollen by natural pollinators (all four sites are at least 2 km from any other). It is not possible to know how long ago sexual reproduction ceased (NSW NPWS 2003).

Individuals are able to regenerate vegetatively from their lignotubers in the absence of sexual reproduction. The size and spread of the lignotubers suggests that the plants are of significant age, probably several hundred to thousands of years old (NSW NPWS 2003). The age to maturity is estimated to be 10-20 years (expert advice). Therefore the generation length is estimated to be 250 - 500 years.

Number of mature individuals:

Only five mature individuals of this species are known. Three of the known subpopulations support what are believed to be only single plants (all near Mongarlowe, with at least a two km

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separation between the sites). The other sub population (30 km away, near Windellama) has two individuals present (located 40 m apart). It is not currently known whether these two plants are genetically different, or whether they may have originated in the distant past from a common lignotuber.

The four sites were last surveyed in 2007, with no change to population numbers (expert advice).

Threats:

The extremely narrow genetic base and lack of successful reproduction in the wild are likely to threaten *E. recurva* in the long term (NSW NPWS 2003). The very small number of individuals and their distribution as isolated individuals within a few subpopulations makes *E. recurva* highly susceptible to extinction through stochastic events such as wildfire, or severe drought. Survival of the species following a fire is likely to depend on regeneration from lignotuber (NSW NPWS 2003).

At all three Mongarlowe sites, the main threats are associated with human visitation to the area, including the collection of plant material, soil compaction and associated habitat degradation via vehicular damage (which have previously damaged shoots sprouting from the lignotuber). Visitation also poses the risk of introduction of soil-borne fungal pathogens eg *Phythopthera cinnamoni* (NSW NPWS 2003). One plant in the Mongarlowe area suffered major die-back of most of its stems sometime in the late 1990s (NSW NPWS 2003). The cause of this is unknown.

At the Windallama site, the main threat is habitat loss and degradation associated with clay mining and associated activities (since 1995). Following negotiations for protection of the plants at the clay mining site, the access road was rerouted and a fence erected to reduce future risks to the plants (expert advice 2008). In November 2002 one of the Windallama plants aborted its bud crop, possibly as a result of the drought (NSW NPWS 2003).

Extreme fluctuations:

There is no information/evidence of this species experiencing extreme fluctuations.

Population reduction and continuing declines:

No decline in the population has been recorded. A decline may be projected in future if the continuing failure to reproduce in the wild precludes replacement of any existing plants that may be lost to senescence, disease, habitat degradation or stochastic events.

The habitat in which this species occurs is unsuitable for agriculture. It therefore seems unlikely that the *E. recurva* has undergone a substantial decline as a consequence of past clearing for agriculture. The small number of individuals and apparently low genetic diversity suggests that the species may have limited capacity to adapt to changes in the environment (NSW NPWS 2003). It also seems unlikely that this species will ever naturally increase in numbers as a result of its low genetic diversity and lack of recruitment in the wild. This species is therefore projected to undergo a future decline. Some of the current individuals may continue to live for several hundreds of years, but ongoing human induced threats may greatly reduce survival.

Extent of Occurrence (EOO) & Area of Occupancy (AOO):

The AOO of *E. recurva* are estimated to be 16 km^2 (based on occupancy of four 2 x 2 km grid cells, the scale recommended by IUCN (2008) for assessment of AOO). The EOO of *E. recurva* is estimated to be no more than 30 km^2 based on the distance between the most widely separated occurrences and the linear alignment of locations (IUCN 2008).

Severe fragmentation:

This species is severely fragmented as all of its individuals are found in very small isolated populations with no evidence of recent genetic exchange between the subpopulations.

References:

Crisp MD (1988) *Eucalyptus recurva* (Myrtaceae), a new species from the Southern Tablelands of New South Wales. *Telopea* **3**, 223-230.

Hill KD (2002) *Eucalyptus*. In 'Flora of New South Wales. Vol. 2; Revised Edition'. (Ed. GJ Harden) pp. 96-164 (University of New South Wales Press: Sydney)

NSW NPWS (2003) 'Draft Recovery Plan for the Mongarlowe Mallee (*Eucalyptus recurva*).' NSW NPWS, Sydney.

IUCN (2008) 'Guidelines for using the IUCN Red List Categories and Criteria. Version 7.0.' (Standards and Petitions Working Group of the IUCN Species Survival Commission Biodiversity Assessments Sub-committee: Switzerland)
(http://intranet.iucn.org/webfiles/doc/SSC/RedList/RedListGuidelines.pdf).

Explanatory note

Between 2007 and 2009 the NSW Scientific Committee undertook a systematic review of the conservation status of a selection of plant and animal species listed under the Threatened Species Conservation Act. This species summary report provides a review of the information gathered on this species at the time the Review was undertaken.

The Scientific Committee's report on the Review of Schedules project and final determinations relating to species that were either delisted or had a change in conservation status can be found on the following website: www.environment.nsw.gov.au .

The Committee gratefully acknowledges the past and present Committee members and project officers who ably assisted the Committee in undertaking the Review of Schedules Project. Information on the people involved in the project can be found in the Acknowledgement section of the project report entitled "Review of the Schedules of the Threatened Species Conservation Act 1995. A summary report on the review of selected species" which is available on the abovementioned website.

This species summary report may be cited as:

NSW Scientific Committee (2008) *Eucalyptus recurva* Review of current information in NSW. June 2008. Unpublished report arising from the Review of the Schedules of the Threatened Species Conservation Act 1995. NSW Scientific Committee, Hurstville.

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