

## Eucalyptus camaldulensis var. camaldulensis River Red Gum

### TAXONOMY

Division	Angiosperm (flowering plant)
Subclass	Dicotyledonae (dicotyledon)
Family	MYRTACEAE

**Taxonomic Identification Number** 40181 (ANH et al 2006)

### Previous Taxonomic Names

*Eucalyptus camaldulensis* since 1832 but also listed as *Eucalyptus tereticornis*, *E. longirostis*, *E. acuminata* and *E. rostrata* (ANH et al 2006).

### Taxonomic Status

Long lived woody perennial.

### Common Names

River Red Gum, Murray Red Gum, Red Gum, River Gum (ANBG n.d.).

### MORPHOLOGY

Tree to 40 m tall. Bark smooth, mottled, shedding at intervals throughout the year to show white, yellow and grey, becoming rough around the base.

Juvenile leaves petiolate, soon alternate, broadly lanceolate to lanceolate, to 11cm long, 3cm wide, dull green.

Adult leaves petiolate, alternate, lanceolate, 10-20 cm long, 1-2 cm wide, dull green. Veins dense, generally with numerous, clear, yellow and green island oil glands.

Inflorescences unbranched, stalks to 2 cm long, 7 flowered.

Buds on stalks, hemispherical, with beaked cap to 1cm long, scar present.

Fruit on stalks, hemispherical to 0.6 cm long, 1cm diameter. Disc ascending, with 4 valves projecting (Walsh & Entwisle 1996).

### SUBSPECIES

There are two other forms of *E. camaldulensis* currently recognised. Neither are found in Victoria (Brooker et al 2002).

- *E. camaldulensis* var. *acuminata* (NSW & QLD)
- *E. camaldulensis* var. *obtusa* (NSW, SA, QLD, WA & NT)

### HYBRIDS

Known to form natural hybrids with *E. cladocalyx*, *E. ovata*, *E. rudis* & *E. viminalis*, but probably also forms natural hybrids with species such as *E. alba*, *E. bigalerita*, *E. aromaphloia*, *E. bridgesiana*, *E. largiflorens*, *E. leucoxydon* and *E. melliodora* (Griffin et al 1988).

### SIMILAR SPECIES

White gums such as Candlebark, Manna and Swamp Gum similar in bark colouration. River Red Gum is easily identifiable by the beaked buds.

### GEOGRAPHIC RANGE

*E. camaldulensis* is the most widely distributed of all eucalypts and is found in all Australian mainland States. It occurs throughout Victoria, except the far east, typically along watercourses and on flood plains (Walsh & Entwisle 1996; Brooker et al 2002).

## **BIOREGIONS**

Victorian Volcanic Plain

Central Victorian Uplands

Otway Plain

## **PLANT COMMUNITIES**

Widespread, commonly in pure stands. Found mostly along watercourses for considerable lengths in Creek-line Herb-rich and Riparian woodlands. Also found in dry forest types in the central uplands. On the volcanic plains, it is typical of grassy woodland, riparian woodlands and wetland ecosystems.

## **FRAGMENTATION**

While widespread, there is incremental loss of River Red Gum through clearing for urban development and agriculture. The timber is used extensively for sleepers and fence posts. Most clearing is recent, since European settlement.

## **RELEVANT HISTORY & RESEARCH**

*E. camaldulensis* is the most widely planted eucalypt worldwide (Walsh & Entwisle 1996). Great variation is shown within this species and provenance is very important as the tolerances and characteristics vary widely (Gowers 1990). Salt tolerant variants from Lake Albacutya and Lowan Valley have been recognised (Marcar et al 2003). Lignotuber development varies with provenance (Karschon 1971), with some populations producing lignotubers. Other provenances, especially those adapted to flooding do not produce lignotubers, but instead time their seed dispersal with receding flood water (Gowers 1990). Pryor and Byrne (1969) found susceptibility to frost injury and frost tolerance varies between provenances along a latitudinal line.

## **POPULATION DENSITY**

Unknown but some large stands still exist in pockets across the region.

## **BREEDING SYSTEMS**

### **FLOWERING**

Small white flowers in groups of up to 12 in summer (Walsh & Entwisle 1996; Bonney 2003), but can be variable (Bonney 2003).

Buds form mid-late summer and are carried for 11-12 months. Flowering varies with area but heavy rainfall may shorten the flowering period. (Clemson, 1985)

Flowers heavily every 2-3 years depending on season (Earl et al 2001).

The nectar is a major source of honey for bees, producing heavy yields in good seasons. Hot winds can stop honey flows. (Clemson, 1985)

### **POLLEN**

Pollen yellowish in colour, prolific and attractive to bees. Red Gum is an important source of pollen for bee development. (Clemson 1985).

### **POLLINATION**

Partially self-compatible, although self-pollination causes a reduction in seed set (Meddings et al 2003).

Meddings et al (2003) studied *E. camaldulensis* var. *obtusa* (from WA and Broken Hill, NSW) and found self-pollination produced a 29% reduction in capsule set and an 86% reduction in the number of seeds produced per capsule when compared with out-crosses.

### **POLLINATORS**

Birds, Bees, Insects (Bonney 2003)

Small mammals - Feather-tail gliders, sugar gliders & eastern pygmy possums known to pollinate Eucalypts (Turner 1982).

### **SEED**

#### **SEED DESCRIPTION**

Seed yellow or yellow-brown, cuboid, smooth (Walsh & Entwisle 1996) and can be difficult to distinguish from chaff (Bonney 2003).

Approximately 700 seeds/gram (Ralph 2003).

90-520 germinants/gram (Bonney 2003).

508 germinants/gram at 25°C (Gunn 2001).

**SEED CROP**

Valves on maturing fruit will turn from green to brownish-red when ripe (Bonney 2003). Seed has a long ripening period, usually maturing during the summer months, about one year after flowering (Ralph 1994). Temperature and seasonal conditions will dictate when seed is ready to pick and seed release can occur quickly once mature (Bonney 2003). Produces heavy crops every 2-3 years (Walsh & Entwisle 1996).

**SEED DISPERSAL**

Water, Ants, Wind (Bonney 2003)

**EXTRACTION & STORAGE**

Dry capsules in a warm position and seed will release quickly (Bonney 2003). Seed stored at 25°C had a germination rate of 91% after 5 years, and 87% after 10 years (Gunn 2001). Storing seed at lower temperatures can dramatically extend this period (Ralph 2003).

**PROPAGATION**

Optimum germination temperatures is 30°C (Ralph 2003), although germination has also been very successful at 25°C (Gunn 2001) and 35°C (Earl et al 2001).

Sow during early summer. One of the easier Eucalypts to germinate providing seed is mature (Bonney 2003).

**TREATMENT OPTIONS**

Smoke treatment has been found to improve germination (Ralph 2003).

**GERMINATION TIME**

Most Eucalypts germinate within 2-5 weeks of sowing (Ralph 2003).

**FIELD ESTABLISHMENT**

Very successfully direct seeded (GAV n.d.). Sow during late spring to early summer (Bonney 2003). Natural regeneration varies by provenance. All provenances can regenerate from seed and will coppice (Gowers 1990).

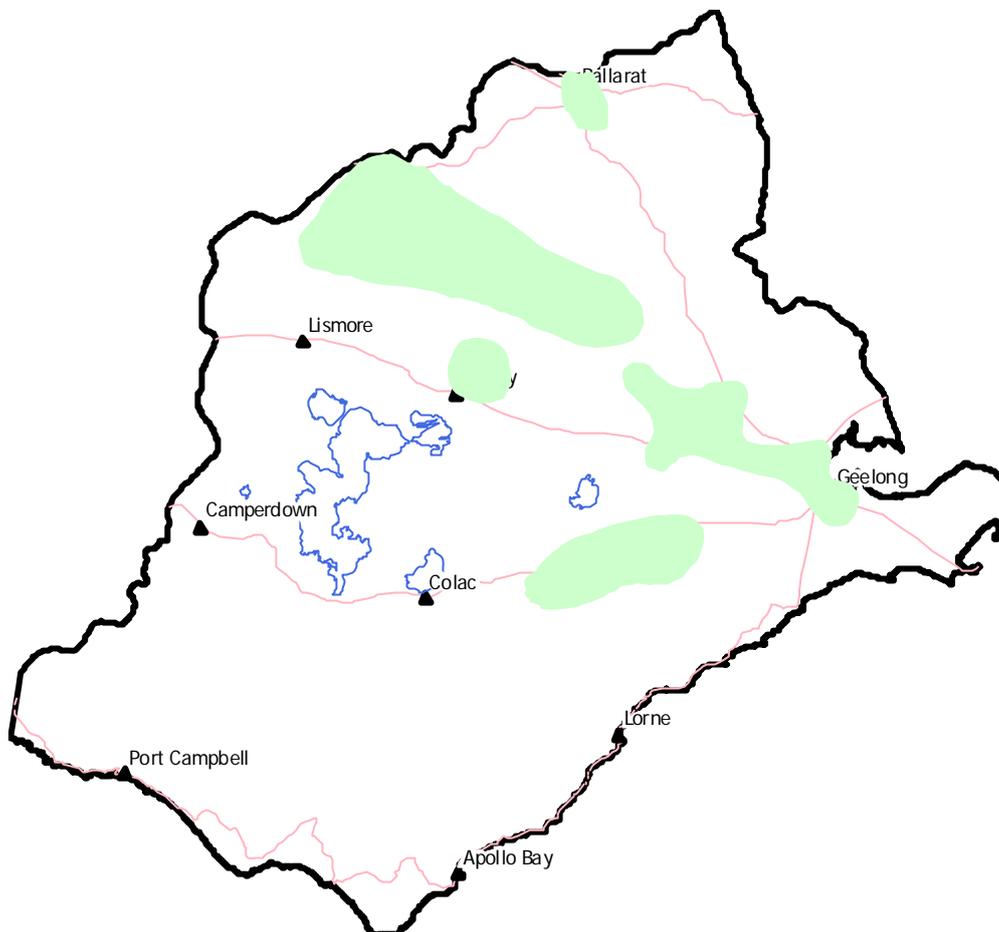
## SEED COLLECTION RANGE - *Eucalyptus camaldulensis* var. *camaldulensis*

**Intermediate collection range—within which, collection can be extended to formally contiguous remnants.**

Research has shown that there are provenance differences with *Eucalyptus camaldulensis* at a broad scale. Some of these may be environmental factors such as changes in soil type and moisture access. Other differences are distinctly genetic such as lignotuber development. Recent fragmentation is likely to have resulted in isolated stands which were once formally contiguous, especially across the Volcanic and Otway Plains. Database records only indicate a partial picture of the extent of red gum across the region.

Consideration should be given to collecting seed from:

- within natural boundaries (such as rainfall and soil type, river systems)
- large, healthy stands
- 30—60 plants over several collection periods to ensure genetic diversity
- Following ethical collection parameters as per FloraBank Guidelines



**MAP: *Eucalyptus camaldulensis* var. *camaldulensis* distribution**  
DATA SOURCE: DSE Flora Information System May 2005, accessed May 2006

 *Eucalyptus camaldulensis* populations

## REFERENCES

- ANBG n.d., *Australian plant common name database*, Australian National Botanic Gardens, Dept. of the Environment & Heritage, retrieved 30 Mar 2006, <<http://www.anbg.gov.au/common.names/>>.
- ANH, ANGB & ABRS 2006, *Australian plant name index*, Australian National Herbarium, Australian National Botanic Gardens, Australian Biological Research Study, retrieved 30 Mar 2006, <<http://www.anbg.gov.au/cpbr/databases/apni.html>>.
- Bonney, N 2003 (2<sup>nd</sup> edition), *What seed is that?*, Neville Bonney, Tantanoola, SA.
- Brooker, MH, Slee, AV, Connors, JR & Duffy, SM 2002, *Euclid : Eucalypts of Southern Australia* (cd-rom), CSIRO Publishing, Collingwood, VIC.
- Clemson, A 1985, *Honey and pollen flora*, Inkata Press, Melbourne, VIC.
- Earl, G, Stelling F, Titcumb, M & Berwick, S (eds.) 2001, *Revegetation Guide for the Goulburn Broken Catchment*, Dept. of Natural Resources & Environment, Melbourne, VIC.
- Gowers, LJ 1990, *Native trees and shrubs of the Ballarat region*, Dept. of Conservation & Environment, Ballarat, VIC.
- Greening Australia Victoria (comp.) n.d., *Indigenous plants for North Central Victoria: a revegetation guide*, Dept. of Natural Resources & Environment, Melbourne, VIC.
- Griffin, AR, Burgess, IP & Wolf, L 1988, 'Patterns of natural and manipulated hybridisation in the genus *Eucalyptus* L'Herit. – a review', *Australian Journal of Botany*, vol.36, pp.41-66.
- Gunn, B 2001, *Australian Tree Seed Centre: operations manual*, CSIRO Forestry and Forestry Products, Canberra, ACT.
- Karschon, R 1971, 'Lignotuber occurrence in *Eucalyptus camaldulensis* Dehn. and its phylogenetic significance', *Flora*, vol.160, pp.495-510.
- Marcar, NE, Crawford, DF, Hossain, AKMA & Nicholson, AT 2003, 'Survival and growth of tree species and provenances in response to salinity on a discharge site', *Australian Journal of Experimental Agriculture*, vol.43, pp.1293-1302.
- Meddings, RA, McComb, JA, Calver, MC, Thomas, SR & Mazanec, RA 2003, '*Eucalyptus camaldulensis* x *globulus* hybrids', *Australian Journal of Botany*, vol.51, pp.319-331.
- Pryor, LD & Byrne, OR 1969, 'Variation and taxonomy in *Eucalyptus camaldulensis*', *Silvae Genetica*, vol.18, pp.57-96.
- Ralph, M 1994 (2<sup>nd</sup> edition), *Seed collection of Australian native plants: for revegetation, tree planting and direct seeding*, Bushland Horticulture, Fitzroy, VIC.
- Ralph, M 2003 (2<sup>nd</sup> edition), *Growing Australian native plants from seed : for revegetation tree planting and direct seeding*, Bushland Horticulture, Fitzroy, VIC.
- Turner, V 1982, 'Non-flying mammal pollination: an opportunity in Australia' in *Pollination '82 : proceedings of a symposium held at the plant cell biology research centre, School of Botany, University of Melbourne, Parkville, Vic. November 24, 1982* (eds. EG Williams, RB Knox, JH Gilbert. & P Bernhardt), pp.110-122.
- Walsh, NG & Entwisle, TJ (eds) 1996, *Flora of Victoria*, Volume 3, Inkata Press, Melbourne, VIC.

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