

**Approved Conservation Advice for
Eucalyptus alligatrix subsp. *miscella* (a stringybark)**

(s266B of the *Environment Protection and Biodiversity Conservation Act 1999*)

This Conservation Advice has been developed based on the best available information at the time this Conservation Advice was approved; this includes existing and draft plans, records or management prescriptions for this species.

Description

Eucalyptus alligatrix subsp. *miscella* (a stringybark), family Myrtaceae, is a small to medium-sized, spreading, woodland tree to 15 m tall, with thick, rough, fibrous bark. The bark is longitudinally furrowed, 'stringy', reddish-brown to grey-brown (NSW OEH, 2012). Adult leaves are dull, blue-green or light green, lance-shaped, 7–17 cm long, 1.5–13.5 cm wide, arising from a 1–2 cm long stalk. Inflorescences bear 3 or 7 flowers, the stalk of the group cylindrical or slightly flattened, 4–6 mm long (NSW OEH, 2012). Buds are ovoid or shortly spindle-shaped, 6–8 mm long, about 4 mm in diameter, and the fruit is cup-shaped or broadly conical, with 3 or 4 cells, 5–17 mm long, and 4–16 mm in diameter (NSW OEH, 2012). The flowering period is unknown (Brooker et al., 1995; NSW OEH, 2012).

Eucalyptus alligatrix subsp. *miscella* differs from *E. a. alligatrix* and *E. a. limaensis* by its lower stature and woodland form, and by having inflorescences with both three and seven flowers (Brooker et al., 1995). *Eucalyptus alligatrix* subsp. *limaensis* and *E. a. alligatrix* are endemic to Victoria (Brooker et al., 1995), whereas *E. a. miscella* is endemic to New South Wales (NSW OEH, 2012).

Conservation Status

Eucalyptus alligatrix subsp. *miscella* is listed as vulnerable. This subspecies is eligible for listing as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act) as there is only one known population with a geographic range of less than 100 km (Briggs & Leigh, 1995) comprising between 1000 and 1500 trees (Brooker et al., 1995).

The subspecies is also listed as vulnerable in New South Wales under the *Threatened Species Conservation Act 1995*.

Distribution and Habitat

Eucalyptus alligatrix subsp. *miscella* is known only from one locality south-west of Rylstone, New South Wales (NSW OEH, 2012), where it is confined to an area of partly cleared grazing land on private property (Brooker et al., 1995). Much of the known population consists of moderately dense regenerating stands following previous clearing, but there are also larger scattered paddock trees, probably pre-dating European settlement (Brooker et al., 1995). Further recruitment and regeneration is minimal (Brooker et al., 1995). The specimen used to describe the subspecies was taken from a pure stand measuring over 10 hectares, on a mostly cleared, stony rise (Brooker et al., 1995). The subspecies grows in sclerophyll woodland on shallow, relatively infertile soils (NSW OEH, 2012). *Eucalyptus alligatrix* subsp. *miscella* may have been part of a more extensive open woodland community prior to the commencement of clearing and grazing (NSW OEH, 2012). Other plant species growing near *E. a. miscella* include *Eucalyptus macrorrhyncha* and *E. blakelyi* (Brooker et al., 1995), as well as *E. viminalis*, *E. bridgesiana*, *E. melliodora*, *E. rossii*, and *Angophora floribunda* (NSW OEH, 2012).

Eucalyptus alligatrix subsp. *miscella* occurs within the Sydney Basin IBRA Bioregion and the Hawkesbury-Nepean Natural Resource Management Region.

The distribution of this subspecies is not known to overlap with any EPBC Act-listed threatened ecological community.

Threats

The main identified threats to *Eucalyptus alligatrix* subsp. *miscella* are:

- Grazing by domestic stock (NSW OEH, 2012) combined with pasture fertilisation. Recruitment and regeneration are likely to be minimal while the area continues to be grazed (Brooker et al., 1995) and if nutrient levels are elevated.
- Further clearing and habitat disruption due to human activities (NSW OEH, 2012).
- Inappropriate fire regimes. High frequency fires may reduce the vigour of mature trees and kill young regenerating trees (NSW OEH, 2012).
- Small population size, in terms of limited distributional area, reduced number of individuals, and low genetic diversity, leading to increased susceptibility of extinction due to single threat events (NSW OEH, 2012).

Research Priorities

Research priorities that would inform future regional and local priority actions include:

- Designing and implementing a monitoring program measuring the amount of recruitment of juvenile trees and regeneration of grazed trees.
- More precisely assessing population size, distribution, ecological requirements and the relative impacts of threatening processes. Addressing basic deficiencies in knowledge regarding identification of life cycle, such as flowering period, pollinator(s), trigger(s) for germination, and recruitment patterns.
- Accurately identifying and undertaking survey work in potentially suitable habitat to locate and map any additional populations.
- Encouraging research into the ecological genetics of this subspecies, and the impacts of fragmentation on the long term survival of this population. Researching provenance boundaries, genetic structure and optimal population size and genetic diversity to maximise chances of survival.
- Identifying the role of fire on the subspecies' life cycle. Identifying optimal fire regimes (frequency and intensity) for regeneration (vegetative regrowth and/or seed germination), and response to other prevailing fire regimes.
- Investigating feasibility of translocation of populations (in accordance with the 'Guidelines for the translocation of threatened plants in Australia' (Vallee et al., 2004).
- Undertaking survey work in potential habitat (including a thorough assessment of threats) to locate any additional localities suitable for future translocations (NSW OEH, 2012).
- Assessing the vulnerability of this subspecies to climate change. Long-lived, endemic taxa with restricted range are particularly susceptible.

Priority Actions

The following regional priority recovery and threat abatement actions can be done to support the recovery of *Eucalyptus alligatrix* subsp. *miscella*:

Habitat Loss, Disturbance and Modification

- Investigate formal conservation arrangements, management agreements and covenants on private land.
- Prevent the further clearance or pasture development of remnant vegetation containing this subspecies.

- Monitor priority sites annually to determine the status of the subspecies.
- Establish populations in cultivation in appropriate institutions such as botanic gardens, and deposit seed in national seed banks.
- Ensure there is no inappropriate disturbance in areas where *E. a. miscella* occurs, including pasture fertilisation, excluding necessary actions to manage the conservation of the subspecies.
- Determine the extent to which edge effects/neighbouring land-uses indirectly affect scattered individual trees or groups of trees. This action includes possible detrimental chemical and fertiliser drift effects, soil characteristics, and road maintenance.
- Where appropriate, create buffer zones of native vegetation around pure stands within the known population. Ensure that any agricultural activities do not occur within 500 m of the known population.
- Establish a roadside marker system where possible. Erect appropriate signage to indicate conservation of individuals or groups of trees.

Invasive Weeds

- Ensure chemicals or other mechanisms used to eradicate weeds do not have a significant adverse impact on *Eucalyptus alligatrix* subsp. *miscella*.

Trampling, Browsing or Grazing

- Ensure land owners/managers use an appropriate stock management regime and stocking density that does not detrimentally affect this subspecies to allow regeneration from seedlings.
- Manage total grazing pressure on private land through exclusion fencing or other barriers. Appropriate fencing to be erected around groups of trees or individuals under threat from grazing.

Fire

- Develop and implement a suitable fire management strategy for the habitat of *E. a. miscella*.
- Where appropriate provide maps of known occurrences to local and state Rural Fire Services and seek inclusion of mitigative measures in bush fire risk management plan/s, risk register and/or operation maps.
- Maintain hazard reduction burning activities during cooler parts of the year, where fuel loads create an increased fire risk.

Diseases, Fungi and Parasites

- Monitor *E. a. miscella* and other nearby members of the Myrtaceae for the presence of any disease, such as myrtle rust (*Puccinia psidii*).

Conservation Information

- Raise awareness of *E. a. miscella* within the local community. Build a network of government and nongovernment organisations and individuals to support management actions.
- Support and encourage landholders across the region to actively develop skills and knowledge in managing this subspecies. Use workshops to aid stakeholders in developing the skills and knowledge required to manage this subspecies.
- Hold meetings or discussions with relevant groups/individuals to emphasise the importance of biodiversity values and discuss options for best management practices.
- Continue the cultivation and propagation of this subspecies in commercial plant nurseries in the area (Brooker et al., 1995).

- Engage with private landholders and land managers responsible for the land on which populations occur and encourage these key stakeholders to contribute to the implementation of conservation management actions.
- To manage the risk of losing genetic diversity, undertake appropriate seed collection and storage. Seeds from representative natural populations to be collected and stored.
- Investigate options for linking, enhancing or establishing additional populations.
- Implement national translocation protocols (Vallee et al., 2004) if establishing additional populations is considered necessary and feasible.

This list does not necessarily encompass all actions that may be of benefit to *Eucalyptus alligatrix* subsp. *miscella*, but highlights those that are considered to be of highest priority at the time of preparing the Approved Conservation Advice.

References

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Vallee L, Hogbin T, Monks L, Makinson B, Matthes M and Rossetto M (2004). *Guidelines for the translocation of threatened plants in Australia – second edition*. Australian Network for Plant Conservation, Canberra.