New Research

Logs are Important for Biodiversity in Australian Box-Gum Grassy Woodlands

This research is important

• Box-gum grassy woodlands are one of the most endangered ecosystems in Australia.

• Logs and woody debris are an important feature of box-gum grassy woodlands, and provide shelter and foraging sites for native mammals, reptiles and frogs.

• An often-overlooked component of biodiversity is the insects, which comprise over half of all species known to science. However, few studies have examined insect biodiversity in box-gum grassy woodlands.

Beetles are an excellent indicator of insect species richness in the ecosystem

• 2000 tonnes of coarse woody debris (logs) were introduced into the woodlands of Mulligans Flat and Goorooyarroo Nature Reserves as part of the larger research experiment on woodland restoration.

• Logs in box-gum grassy woodlands support a highly diverse range of native beetles (from our research, recently published in Biological Conservation).

• Logs provide a variety of food sources for beetles, protection from predators, and shelter from changes in temperature and moisture. This is the first study to show the importance of logs for insects in box-gum grassy woodlands.

• This study compared beetles near logs with beetles under trees and in open ground. The log-associated beetle assemblages were markedly different from those found in open ground or under trees.

• Beetles provide many important functions in the ecosystem. They feed on plants and fungi, break down animal and plant debris, pollinate flowers and eat other invertebrates.
Logs contribute to the diversity of beetles in two different ways, by increasing:

1. **the species richness in the area**
   
The total number of beetle species found near logs under trees was estimated to be more than 375 - five times the number found in open ground, and nearly twice the number found under trees.

2. **the variability of species across the landscape**
   
The species of beetles found near individual logs was highly variable compared with open ground or under trees, because a high proportion of rarer species use the logs.

   The arrangement of logs across the landscape is therefore important for determining the total number of species present. The high species richness of beetles associated with the logs assessed in this study shows the great value of protecting existing logs and woody debris in box-gum grassy woodlands.

Conservation Implications

Logs are important features of box-gum grassy woodlands because they provide:

- Shelter for nesting and refuge from the environment.
- Foraging sites for many different types of animals.
- Sites for water infiltration, nutrient capture and fungi growth.
- Assistance in the movement of organisms through the landscape.

Logs support an incredible number of beetle species, and provide important habitats for the broader insect community.

Logs should be spread across the landscape, both under trees and in the open, to provide a variety of microhabitat conditions for insects.

Removing fallen logs and branches from box-gum grassy woodlands is detrimental to beetle populations, insect biodiversity and the ecological functions they provide.

Where to from here?

Further research is underway looking at how the number and arrangement of logs and the best way they are scattered across the landscape, would best benefit beetle communities in box-gum grassy woodlands.

**Published Research**