

ABSTRACT

One of the few commonly occurring species of digging marsupial in south-western Australia is the subspecies of southern brown bandicoot (*Isoodon obesulus fusciventor*). Unlike a large proportion of Australian digging marsupials that have suffered attrition, bandicoots have persisted and shown resilience to human-mediated disturbance in peri-urban regions. This thesis evaluates some of the ecological roles of bandicoots in ecosystem processes in degraded *Eucalyptus gomphocephala* woodland in Yalgorup National Park.

Bandicoots forage for the fruiting bodies of mycorrhizal fungi and other subterranean food and in doing so make small pits in the soil surface. Surveys of these foraging pits over a six month period revealed they are sites of lower soil hydrophobicity and higher soil moisture compared to the surrounding undisturbed soil. Additionally, the foraging pits and the area immediately surrounding them collect more leaf litter than the surrounding areas.

The impact of foraging pits on ant-seed removal rates was explored by creating artificial diggings. Three local seed species *Acacia saligna*, *Eucalyptus gomphocephala*, and *Kennedia prostrata* were used in a cafeteria style experiment. Results found artificially created diggings had no effect on seed removal rates and that *E. gomphocephala* had the highest seed removal rate.

This study suggests that bandicoots provide an important source of soil surface heterogeneity, contributing to ecosystem processes. Their presence in the landscape has the potential to contribute to the restoration of degraded ecosystems.