# Biodiversity responses to vegetation structure in a fragmented landscape: ant communities in a peri-urban coastal dune system

***by Sophie Cross, winner of the 2014 Stuart Knott Scholarship***

The coastal dune system of southwest Western Australia represents one of the world's global biodiversity hotspots, harbouring numerous endemic plants and animals. However, this system is facing increasing pressures from urbanisation, resulting in increased rates of habitat fragmentation, the introduction and proliferation of detrimental invasive species, and substantial loss of biodiversity.

With the growing pressures on coastal systems, the implementation of effective conservation and management is becoming increasingly important. Ants are generally regarded as excellent biological indicators (bioindicators) of habitat health, as they are ubiquitous, have well studied community dynamics, and are known to be sensitive to environmental changes and disturbances following habitat disturbances.

*A species of **Rhytidoponera.** These ants are often found in the vegetation surrounding urban areas.*

Using ants as bioindicators, Sophie examined the effect of vegetation degradation on ant species diversity and abundance in the Perth coastal dune system. She hypothesised firstly that the condition of remnant vegetation would have strong impacts on the presence and abundance of ant species, and secondly, areas more affected by degradation would have higher abundances of invasive ants.

To assess these impacts, she set 20 pitfall traps (small plastic containers sunk into the sand and part filled with the preserving chemical ethylene glycol) at 30 sites, in three different seasons; autumn, winter, and spring, totalling 1800 traps, and roughly 200 hours in the field. Trapping yielded fantastic results, with 5685 ants (all individually identified, requiring a further 180hrs of microscopy work) from 36 species collected.

From these results, she was able to conclude that although vegetation degradation had little overall impact on ant species diversity and abundance, the invasion of exotic ants, especially the coastal brown ant (*Pheidole megacephala*) had major impacts on ant communities in closer proximity to urban development. It is therefore essential that for conserving ant diversity in our coastal dune system, a priority must be placed on the prevention of the invasion and establishment of exotic species. This may be achieved through the rehabilitation and restoration of native vegetation, especially within habits in closer proximity to urban development.

Sophie's thesis resulted in an article published in the Journal of Insect Conservation – link: http://link.springer.com/article/10.1007/s10841-016-9881-y