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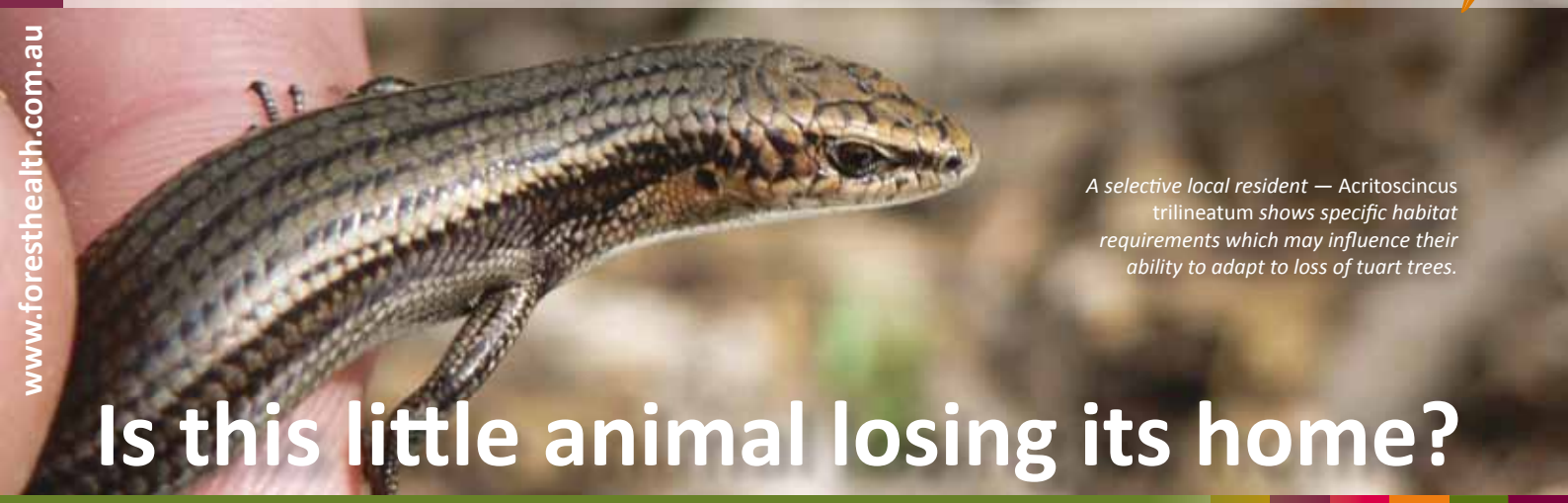


A selective local resident — Acritoscincus trilineatum *shows specific habitat requirements which may influence their ability to adapt to loss of tuart trees.*

Is this little animal losing its home?

KOBUS WENTZEL • MICHAEL CRAIG • PAUL BARBER • GILES HARDY • TRISH FLEMING

Environmental changes such as reduced vegetation cover and altered plant species composition can have serious consequences for ecosystems, and can lead to the extinction of animal species.

Tree declines are justifiably causing alarm worldwide. Not only are we losing tree species, but also animal species dependant on these trees. The loss of trees and associated fauna result in the loss or compromise of essential ecosystem processes. Fundamental processes that may be influenced include altered food web dynamics and the nitrogen cycle and pollination processes.

The tuart (*Eucalyptus gomphocephala*) decline in Western Australia is a great concern. This once dominant and iconic tree species is suffering significant decline and has disappeared from most of the Swan Coastal Plain. Researchers from the Centre of Excellence for Climate Change, Woodland & Forest Health have been researching the possible consequences of tuart decline for fauna. Not only will this research provide us with greater understanding of the implications of tuart decline, but it may also enable nature conservationists and land managers to proactively put management strategies in place to safeguard animal species that may be threatened by tuart decline.

Method & Results

A system of 24 fauna trapping lines were established in Yalgorup National Park, which is situated south of Perth. Sites include a range of tuart habitat (healthy tuart to localities characterised by declining tuart). Biodiversity surveys were carried out at these sites, including mammal and reptile trapping, census of bat calls as well as bird counts.

In total, 21 reptile species were trapped in the area. Preliminary results indicate that some lizard species, particularly skinks, show distinct preferences for healthy tuart plant communities and associated habitat characteristics. For example, the western three-lined skink (*Acritoscincus trilineatum*) shows significant preference for healthy tuart sites over those where tuart is declining (see Figure 1). These tiny (19cm long and weighing ~5g) skinks are found across the southwest corner of

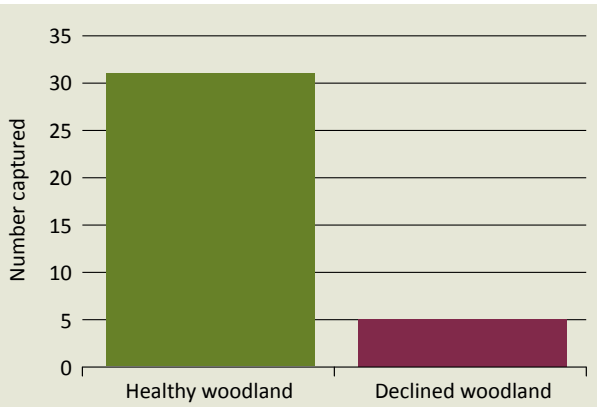
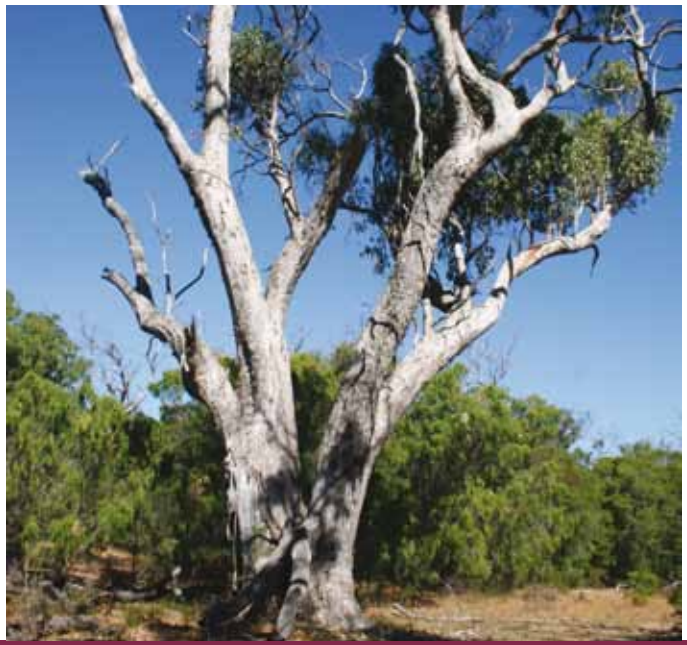
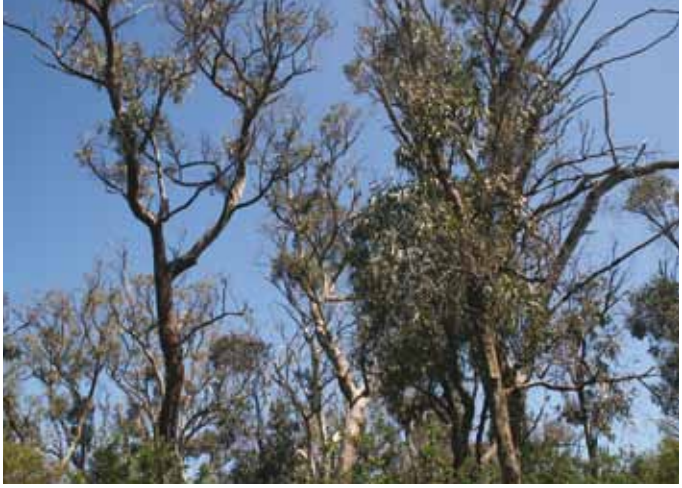
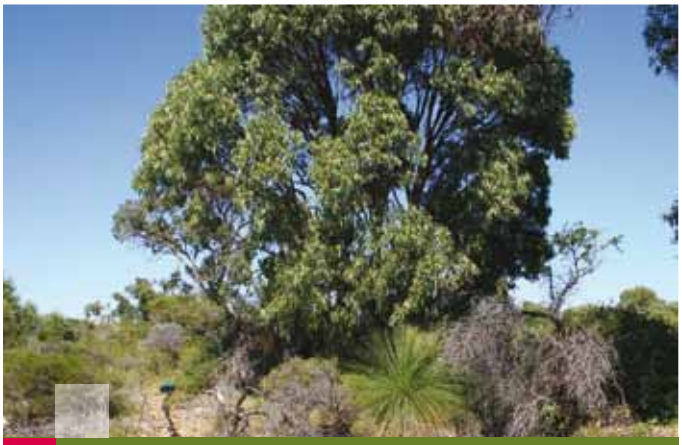


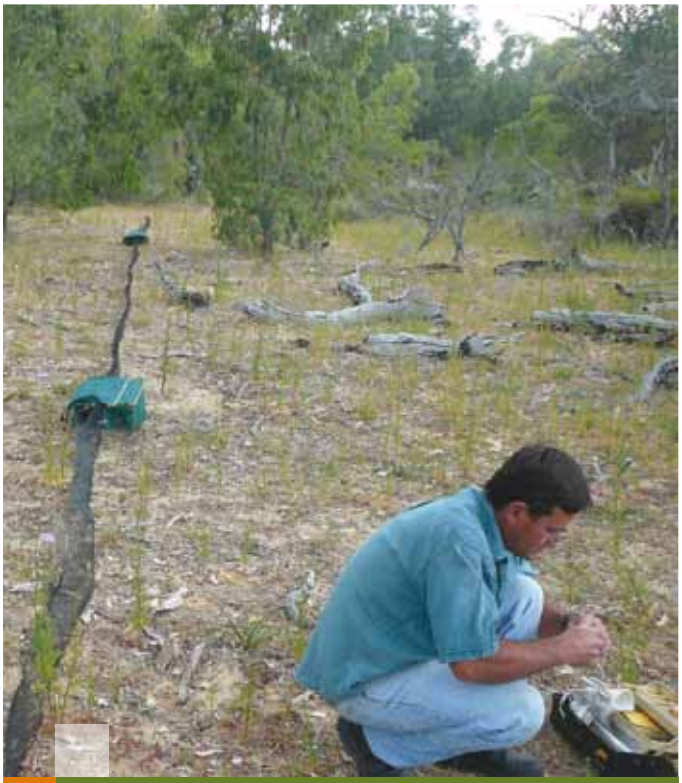
Figure 1 The number of Acritoscincus trilineatum *captured over 24 fauna trapping lines established in healthy and declining tuart communities in Yalgorup National Park, south of Perth between spring 2007 and winter 2008.*







A view of the Yalgorup National Park, showing declining (top) and healthy (above) tuart trees.



PhD candidate, Kobus Wentzel, in front of one of his pit trap lines for biodiversity sampling.

Western Australia, however they are very selective about their habitat within this range. Healthy tuart communities boast a well-developed leaf litter layer, which may favour these species.

We know so little about the biology of these skinks. *Acritoscincus trilineatum* is associated with thick vegetation and moist conditions (Bush *et al*. 1995; Wilson and Swan 2003) and prefer areas with high canopy cover and tree densities (Craig, unpublished data, 2008), conditions associated with healthy tuart communities. A recent study (Nichols and Grant 2007) summarising 30 years of research into rehabilitated mine sites concluded that numbers of *Acritoscincus* increase with restoration age, and they are more common in dense, stream zone vegetation, and sites where soil moisture is high. In the declining tuart sites, in addition to the dying tuarts, understorey vegetation is lost and there is less leaf litter and subsequently reduced soil moisture.

Conclusions

Animals like this skink, which have specific habitat requirements, may be severely impacted by tuart decline. The reduced leaf litter associated with declining tuart communities is also predicted to impact negatively on the two-toed mulch skink *Hemiergis quadrilineata*, a fossorial species with rudimentary legs that 'swims' through and under leaf litter foraging for small prey like termites and ants.

Tuart decline is spreading relentlessly, and may have far-reaching implications for reptiles, mammals and birds, species that may already be under pressure due to anthropogenic habitat destruction and climate change. This research project is part of a long-term research programme, with one of its goals trying to determine the impact of tree decline on fauna. We have only just started the exciting journey to unravel the links between our declining trees, fauna and environment. Watch this space!

Acknowledgements

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