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Impact of *Phytophthora* dieback on reptiles in banksia woodlands

Phytophthora-*diseased banksia woodland. The foreground shows the area that has been affected by* Phytophthora*, together with a disease front (dead and dying plants) and healthy background.*

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Phytophthora cinnamomi **is a soil-borne water mould (Class Oomycetes) that is listed by the IUCN Species Survival Commission as one of the world's 100 most devastating invading species. Consequences of *Phytophthora* infestation include loss of susceptible plant species, reduction in primary productivity and biomass and changes to habitat structure. These changes in floristic communities and vegetation structure are likely to have consequences for fauna.**

The impacts of *Phytophthora* on native vegetation can be severe, especially for plants in the Proteaceae family (e.g. *Banksia* spp.) that are susceptible to *Phytophthora* infection. The banksia woodlands on the Swan Coastal Plain are threatened by *Phytophthora* dieback, with more than 20,000 ha of habitat between the Moore and Swan River infected by *Phytophthora*[1]. The banksia woodlands of the Swan Coastal Plain are historically rich in reptile species[2] but *Phytophthora* dieback may impact the reptile fauna of this area by changing the availability of microhabitats that reptiles require (e.g. leaf litter). For example, previous research in Victoria has shown that abundance and species richness of small mammals is lower in vegetation infested with *Phytophthora cinnamomi*[3].

*The small western heath dragon (*Ctenophorus adelaidensis*) was one of the species that was rarely observed in* Phytophthora*-diseased sites.*

Methods & Results

This project examines how reptile communities differ between *Phytophthora*-diseased and healthy (apparently uninfected) banksia woodlands on the northern Swan Coastal Plain. Healthy sites had greater amounts of canopy cover, litter cover, litter depth, coarse woody debris and a higher density of banksia plants. In contrast, the diseased sites had greater amounts of bareground and a higher density of grass trees.

Pit-fall and funnel traps were used to capture reptiles at 10 sites (five diseased, five healthy) during Autumn 2011. Total reptile abundance was lower in diseased sites compared to healthy sites (see Figure 1). Some species demonstrated significant habitat preferences, e.g. more terrestrial western heath dragons (*Ctenophorus adelaidensis*) were trapped in healthy banksia woodlands. Reptile abundance was positively associated with higher amounts of canopy cover (see Figure 2).

Figure 1 Mean (±SE) reptile abundance averaged over five Phytophthora*-diseased and five healthy banksia woodland sites.*

Healthy banksia woodland on the northern Swan Coastal Plain.

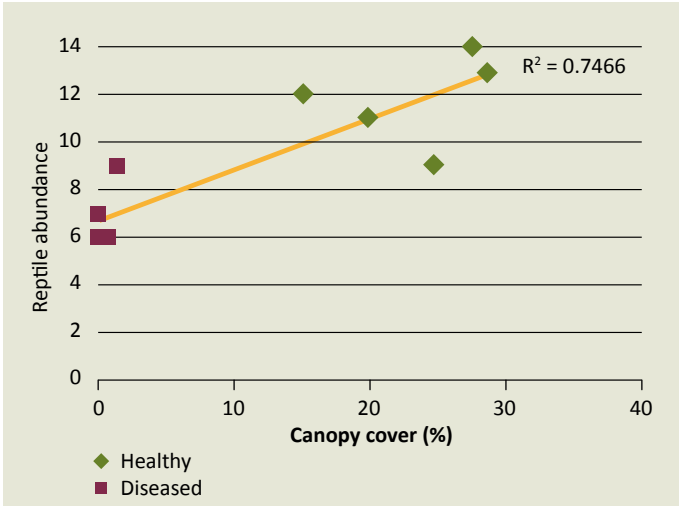

Figure 2 Association of reptile abundance and canopy cover at Phytophthora*-diseased and healthy banksia woodland sites.*

Conclusions & Recommendations

Reptile abundance was higher in healthy banksia woodland sites. The small western heath dragon *Ctenophorus adelaidensis* was one of the species that was rarely observed in *Phytophthora*-diseased sites.

Phytophthora cinnamomi drastically changes banksia woodland structure that consequently supports fewer reptiles than disease-free woodlands. Given the large areas of banksia woodlands currently infested by this pathogen, *Phytophthora cinnamomi* represents a significant threat to reptile populations of banksia woodlands on the Swan Coastal Plain. Identifying infested banksia woodlands and reducing the risk of spread to healthy habitat is already taking place under current management processes. Understanding the mechanisms that determine reptile presence will help to identify key habitat banksia sites for reptiles which can be targeted under these quarantine processes.

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Donna Simmons with one of the lizards she is studying.

References

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3. Laidlaw W. S. & Wilson B. A. (2006) Habitat utilisation by small mammals in a coastal heathland exhibiting symptoms of *Phytophthora cinnamomi* infestation. *Wildlife Research* **33**, 639-49.