

Potential projects with Assoc Prof David Eldridge

Please do not hesitate to contact me about these, or any other research projects.
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Rabbits as landscape modulators

Rabbits have dramatic and varied effects on ecosystem properties and processes. One of these effects is to produce resource-poor patches (warrens) that persist for many years. Another effect is to create foraging pits that influence seed capture and germination of vascular plants. This study will examine whether pits and warrens support unique assemblages of plant species or merely a subset of species present in the plant community.

Location: Yathong Nature Reserve (Cobar) or Nanya (Broken Hill)



Numbat foraging in relation to availability of subterranean termites

Numbats (*Myrmecobius fasciatus*) are critically endangered and confined to a few small areas of south-western WA. Numbats have been reintroduced into predator-free exclosures in western NSW. This study will examine the links between numbat foraging pits and the distribution of subterranean termite galleries, as well as landscape variables in order to predict where numbats may be foraging.

Location: Scotia Sanctuary with the Australian Wildlife Conservancy.



Animal foraging pits: affects of shape and size on resource capture and retention

Litter remaining on the soil surface in arid landscapes is broken down by photo-oxidation and contributes little to soil nutrient pools. However, litter trapped in depressions is more likely to contribute to soil nutrient pools. This study examines the links between pit shape and size, and the capture efficiency of litter using artificial pits. Other studies will also evaluate the importance of soil for holding litter *in situ*.

Location: Yathong Nature Reserve (Cobar), Arid Recovery (Roxby Downs)



Use of artificial watering points by animals in an arid woodland

Locally-extinct native mammals such as the stick-nest rat and Marla have been reintroduced into fenced exclosures at Scotia Sanctuary. As part of the re-introduction program, supplementary water is provided in order to enhance the survival prospects for these animals. However, little is known about whether the animals actually use free water or the other animals (e.g. birds) that might use it. This study will involve regular monitoring of animal use of water at two locations in an arid woodland.

Location: Scotia Sanctuary (AWC)



Tradeoffs between tree density and size in managed Callitris glaucophylla woodlands

Dense stands of white cypress pine (*Callitris glaucophylla*) are thought to suppress the growth of vascular plants by competing for water, nutrients and light. Forests NSW have been experimentally manipulating stand density over the past 30. This study will compare a range of ecosystem properties (e.g. plant diversity, composition, microbial respiration, infiltration, soil surface morphology, litter decomposition) across density gradients to test the hypothesis that increasing tree density equates with enhanced ecosystem function.

Location: Forbes with Department of Environment and Climate Change



Shrubs as competitors or facilitators?

Anecdotal evidence suggests that woody shrub encroachment leads to the suppression of understorey plants. This is inconsistent however with the large body of research showing that shrubs have important facilitatory effects on plants and soils. This study will test the hypothesis that overgrazing masks the facilitatory effect of shrubs on understorey plants using field survey along a degradation gradient in western NSW and supported by glasshouse trials.

Location: Scotia Sanctuary (Buronga)



Vegetation recovery on ripped rabbit warrens

The European Rabbit (*Oryctolagus cuniculus*) is Australia's number one vertebrate pest. In the past 20 years, land managers in western NSW have spent millions of dollars controlling rabbits. The most effective method is to destroy their warrens, usually by mechanical ripping. However, rabbit control has not always been effective. This study will test the effectiveness of rabbit warren ripping in five vegetation communities in western NSW to analyse: 1) reinvasion of warrens by rabbits, 2) changes in vegetation on the old warrens, and 3) changes in soil surface morphology after ripping.

Location: arid and semi-arid NSW in collaboration with Western CMA.



Are foraging pits correlated with densities of burrowing spiders?

Soil disturbances such as pits, mounds and burrows are constructed by a range of animals including spiders, ants, beetles, skinks, goannas, rodents, echidnas and rabbits. We hypothesise that the density of goanna foraging pits is greater in healthier, functional landscapes (greater resources) than unhealthy, resource-poor landscapes. This study will examine the density of goanna pits in relation to the density of gecko and *Lycosid* spider burrows and their occupancy using a 'burrowscope' and will be supported by experiments on the response of goanna foraging to manipulated resource levels.

Location: Scotia Sanctuary (Buronga) in collaboration with James Val (DECC)

