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THE HABITAT PREFERENCES OF RE-INTRODUCED STICK-NEST RATS (*LEPORILLUS CONDITOR*), ROXBY DOWNS, SOUTH AUSTRALIA

Sally O'Neill^{1,2} & Fleur Tiver¹

¹ School of Environmental and Recreation Management, University of South Australia,
Mawson Lakes SA 5095.

² Current Address : National Parks and Wildlife – Conservation, Department for Environment and
Heritage GPO Box 1047 SA 5001.

Abstract

A reduction in vegetation cover by exotic herbivores, primarily sheep and rabbits has been attributed to the decline of many small mammals in the semi-arid and arid regions. A recently reintroduced colony of the endangered greater stick-nest rat (*Leporillus conditor*) was studied at the 14 km² Arid Recovery Project enclosed reserve, Roxby Downs, South Australia, from April – October 1999. The aim was to determine the habitat preferences of the species in relation to available floristic and structural habitat attributes. Nest sites were located with the aid of radiotelemetry.

Location of nest sites showed that floristic association preferences were correlated with the presence of species that provide preferred structural characteristics. *Eragrostis setifolia* – *Maireana aphylla* shrublands were found to be strongly preferred. *Maireana aphylla* was strongly selected for nesting purposes and is the most structurally compact species available in the study area, having a very dense structure from ground level to a minimum height of 40 cm. The study highlighted the importance of vegetation cover to the species during re-introduction programs, particularly in the arid regions where there is dispersed nature of suitable shelter.

Introduction

Greater stick-nest rats were once distributed across semi-arid and arid zones of mainland Australia and were relatively common at the time of European settlement (Copley 1994). The species became rare by the 1930's and soon was only found where sheep and cattle had not degraded suitable habitat (Robinson 1983). The most important cause of decline was modification and destruction of habitat, primarily through a reduction of vegetation cover by sheep and rabbits. Shrub communities occupied and preferred by stick-nest rats were amongst the first and worst effected by overgrazing (Copley 1988).

The species is now extinct on mainland Australia with the only known population found on the Franklin Islands (far west coast of South Australia). From this a captive breeding program was established in 1985 by National Parks and Wildlife South Australia. The program was successful and provided for the establishment of further populations on offshore islands, and most recently at the Arid Recovery Project Reserve, Roxby Downs, South Australia.

The aim of this study was to determine the habitat preferences of re-introduced greater stick-nest rats (*Leporillus conditor*) in a natural environment, within part of their former mainland range. An objective was to determine if habitat preference is based on floristic composition or structural formations.

Floristic Habitat

Floristic vegetation associations were identified through standard vegetation surveys, by collecting floristic data from 52, 50 x 20 m quadrats within the 14km² enclosed reserve. The most common floristic associations consisted of *Salsola kali* – *Dodonea viscosa* and *Atriplex vesicaria* – *Maireana astrotricha*.

Twenty four nests were identified and studied allowing for a comparison of available floristic habitat and utilised floristic habitat. By ranking and comparing the proportion of available floristic associations to used floristic associations, an order of preference was obtained. The most preferred floristic association was *Eragrostis setifolia* – *Maireana aphylla*, followed by *Acacia aneura* – *Dissocarpus paradoxus* and of least preference was *Atriplex vesicaria* – *Maireana astrotricha*.

Structural Habitat

In order to better understand the use of habitat, structural attributes were also examined. Each plant species for each study quadrat was assigned a life form category based on Muir (1977) and the total cover score for each category was then determined for each quadrat. Five distinct structural groups were identified. The structural groups preferred were dominated by tall shrubs, small trees and sub-shrubs with many other life forms present.

Nest Structure

The nests were studied to identify the characteristics of vegetation showing properties suitable for nesting. Nest-plant structural density was measured by using a marked 1 m ruler placed horizontally through the nest-plants at 10 cm intervals from ground level, from this a density proportion was established. The minimal density was found to be 70% at ground level, reducing to 64% at 30cm. Eighty two plants were selected by point quarter technique giving a random selection of shrubs within the reserve. None were as dense as shrubs actually used for nesting. Nests within *Maireana aphylla* were the most structurally compact.

The results identified that plants of suitable density for nesting are very sparsely distributed in the landscape, and that stick-nest rats therefore are extremely selective in choosing nest sites. This does not take into consideration existing burrows. It is presumed that that if a suitable burrow is present, the surrounding vegetation does not have to be as dense, therefore the amount of available potential nests is greater.

Conclusion

Habitat for nest site location is not solely based on floristic or structural components, but rather a combination as the two are interrelated. A preference for floristic species was shown, and is due to structural attributes. The available structural habitat was used for nest location disproportionately, and thus is actively selected.

Eragrostis setifolia – *Maireana aphylla* shrublands were found to be strongly preferred as there was a much higher proportion of rats utilising this association in relation to the proportion available. *Maireana aphylla* is the most structurally compact species available, having a dense structure at ground level and to a height of at least 40cm, and was strongly selected by the rats for nesting purposes.

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