Presence, breeding activity and movement of the yellow-footed antechinus (*Antechinus flavipes*), in a fragmented landscape of the southern Mt Lofty Ranges.

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ABSTRACT

Habitat fragmentation poses a threat to small mammal populations existing in remnant vegetation. Reduced habitat area, habitat isolation and inhibited dispersal are some of the factors that can increase the risk of local and regional extinction. This study was undertaken to examine the persistence of the yellow-footed antechinus (*Antechinus flavipes*) in a fragmented landscape of the southern Mt Lofty Ranges in South Australia. Live trapping was carried out in small, remnant patches and strips of forest and in areas of contiguous forest, to document autecological data for the species and to investigate occurrence, breeding activity and inter-patch movements. Radio-tracking was also conducted to compare home range properties of lactating females, in restricted and unrestricted habitat.

Results of autecological investigations showed mostly comparable population densities and body weights with other *A. flavipes* populations. However, regional differences were detected in juvenile dispersal behaviour and to some extent, breeding times. The study populations showed a male-biased, natal dispersal strategy, which is the first published record of such a strategy for *A. flavipes*. This result differed from Queensland populations, which did not show distinct dispersal phases. Regional differences regarding breeding times have been attributed to varying peaks in insect abundance. The causes of the differences in dispersal behaviour remain unclear. Site differences were also apparent. Forest animals were lighter, were largely of lower population density (particularly in 2000) and were generally later breeders than patch and strip animals. Differences in weight and population density may be due to favourable 'edge effects' in remnants, while variations in breeding times may be due to local climatic or habitat factors. Despite being largely 'isolated' for approximately 50 years, all study sites detected the presence and breeding activity of *A. flavipes* in at least one of the two seasons sampled. Inter-patch movements by males and females were detected during the juvenile dispersal phase and the 2001 breeding season. Most movements were by adult males, while females tended to be recaptured in the same patches. Landscape types potentially traversed included exotic pine plantations, open paddock and narrow sections of native vegetation. Movement between sites indicated the presence of a metapopulation operating amongst local populations. Home range

investigations did not provide conclusive evidence to suggest that *A. flavipes* was able to adapt or change home range behaviour in response to habitat restriction. However, it did show that the species was able to tolerate some degree of home range overlap between resident, lactating females. Investigations also revealed the use of the landscape matrix for resource supplementation. The adaptability, life-history strategies and a tolerance of the landscape matrix shown by *A. flavipes* provide some explanation for the species' success in this fragmented system.

It is considered that the long-term persistence of *A. flavipes* in this landscape will be determined by the ability of females to maintain a presence in the small patches, the ability of unrelated males to move into the patches to breed with resident females and the maintenance or enhancement of the current habitat area and distances between habitat sites. This study illustrates the importance of recognising the occurrence of metapopulations in fragmented landscapes for conservation management purposes.

DECLARATION

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

I give consent to this copy of my thesis, when deposited in the University of Adelaide Library, being available for loan and photocopying. All references to this thesis or any information therein must be fully acknowledged in any report or publication.

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Doreen Marchesan Dated

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