



The size and structure of rabbit populations should be considered when selecting methods of rabbit control.

It pays to count your rabbits

When planning assaults on rabbit populations, as in any battle, it pays to know as much as possible about their size, structure and habits. The battle plan will be much more successful if it targets a weakness in the rabbit community.

Drs John Wilson, Susan Fuller and Peter Mather, of the Queensland University of Technology, have looked at the genetics of rabbits in an arid to semi-arid region of Queensland to determine rabbit population structures and the mechanisms responsible for them.

They were particularly interested in the importance of habitat attributes (such as soil type and food) on the local distribution of rabbit populations and the formation of multiple rabbit populations.

By analysing DNA samples, the researchers have identified two very different overall rabbit population systems in south-west Queensland, with the boundary between the two located near the Maranoa River.

The western system occurs on largely rabbit-favourable (sandy) soils with moderate food availability that coincides with the breeding season. Here there is little genetic structuring among local

rabbit populations and high levels of gene flow, indicating that local populations are highly interconnected over large geographical areas.

On the other hand, the scientists found restricted gene flow in the eastern system, consistent with lower connectivity between fairly discrete local populations. This area has only limited areas of soil suitable for warren formation and food availability does not coincide with the breeding season.

It seems that the behaviour and ecology of the 'wascally wabbit' is flexible enough to respond appropriately to these contrasting environments.

In the eastern region – where small and scattered patches of favourable rabbit habitat are separated by large expanses of very unfavourable habitat and nest sites are limited and clumped – a more rigid social organisation develops, with competition for burrow and mates. A 'resource-defence' mating system tends to occur.

One consequence of all this is a rabbit society characterised by a patchy distribution of rabbits, populations existing as essentially separate entities with high probabilities of local extinction and recolonisation and hence restricted gene flow between distant populations.

The pattern in the western system contrasts with this; rabbits exhibit a more relaxed social system with a promiscuous mating system and little population structuring. Here much greater gene flow occurs between local populations.

This has important implications for rabbit management.

Broad-scale control methods that require passive transport of control agents by dispersing rabbits, such as myxomatosis and calicivirus disease, are unlikely to prove effective where rabbit populations occur in small, isolated sub-units.

Conversely, local control methods that destroy individual warrens will ultimately prove unsuccessful in large rabbit populations in which extensive exchange and recolonisation are the norm.

More about rabbit populations

Wilson JC Fuller SJ and Mather PB (2002)

Formation and maintenance of discrete wild rabbit (*Oryctolagus cuniculus*) population systems in arid Australia: Habitat heterogeneity and management implications. *Austral Ecology*, 27:183–191.

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