

An Assessment of Animal Repellents in the Management of Vehicle-Macropod Collisions in New South Wales

Submitted by
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Abstract

Collisions between animals and motor vehicles are frequent and often result in animal mortality. In Australia, macropods are regular victims of these collisions. This has serious implications for animal welfare and conservation as well as aesthetics and tourism. Collisions with large animals and secondary collisions caused by the presence of animals on road easements, can lead to serious personal injury and property damage. A range of mitigative measures to prevent animal-vehicle collisions exists, but no single measure can be fully effective and the efficacy of many mitigation measures remains untested. An integrated management approach, employing many mitigative techniques is required to reduce vehicle-animal collisions. Repellents have recently been identified as a potential mitigative measure for reducing vehicle-animal collisions.

The aim of this study was to identify the potential role of repellents in reducing macropod-vehicle collisions in New South Wales. This required the identification and assessment of potential repellents since research investigating repellents in an Australian context is scant. *Macropus rufogriseus banksianus* was selected as a test species for this research as a high abundance of this species exists in southeastern Australia and it is a common victim of roadkill in New South Wales.

Preliminary screening trials of four potential macropod repellents highlighted the utility of two of the substances: Plant Plus, a synthetic compound based on the chemistry of dog urine; and a formulation consisting of chicken eggs. Feeding by *M. rufogriseus banksianus* was significantly reduced when these substances were applied near feed trays. Modest results were also detected for Δ^3 -isopentenyl methyl sulfide (a constituent of fox urine), while a commercial animal repellent (SCAT® Bird and Animal Repellent) was ineffective in altering feeding by *M. rufogriseus banksianus*.

A barrier trial conducted with the two most successful repellents indicated that Plant Plus was a more effective macropod repellent than the egg formulation. Plant Plus displayed qualities of an area repellent and elicited a stronger response from *M. rufogriseus banksianus* when compared to the egg formulation.

Further captive trials determined that the habituation of response to Plant Plus by *M. rufogriseus banksianus* was minimal after six weeks of constant exposure and Plant Plus retained repellent properties after exposure to ambient environmental conditions for at least ten weeks. Field trials to establish the effectiveness of Plant Plus with free ranging macropods (*M. rufogriseus banksianus* and *M. giganteus*) were unsuccessful due to methodological limitations stemming from high background variance in observed responses, equipment failure and site disturbance from outside influences.

The potential role of Plant Plus as a repellent for managing macropod-vehicle collisions was highlighted by the captive trials. However, several factors requiring further research were identified. This included assessing the repellent abilities of Plant Plus in the field and further defining the properties of Plant Plus with captive trials. The effects of Plant Plus on non-target species and an assessment of potential environmental impacts also requires attention.

Research assessing the potential role of repellents in other management contexts in Australia would be beneficial and the identification and assessment of repellents for other species should proceed. However, in the context of assessing repellents for use in the management of vehicle-macropod collisions, immediate focus should concentrate on extending the research to assess the effects of Plant Plus with other species of large macropod, and assessing if Plant Plus can reduce the numbers of macropods in road easements.