Understanding Movement and Habitat Selection of the Lesser Short-tailed Bat to Infer Potential Encounters with Anticoagulant Bait

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Abstract

The lesser short-tailed bat (*Mystacina tuberculata*) and the long-tailed bat (*Chalinolobus tuberculatus*) are New Zealand's only extant endemic land-dwelling mammals. Both species are listed as nationally endangered by the IUCN, with numbers declining due to widespread habitat destruction and other human interferences. Short-tailed bats have been an unintentional victim of toxins used for pest control in New Zealand, being particularly susceptible to poisoning due to their diverse diet and ground-feeding habits. To manage toxin use to minimize bat exposure it is necessary to understand their movements and area usage behaviours.

Movements and habitat use of the short-tailed bat were studied on the area of farmland between Pikiariki and Waipapa Ecological Area, Pureora Forest Park, New Zealand. Bats using the area between the two large forests were studied using acoustic monitoring and radio telemetry techniques to determine which routes they use, how they utilise the farmland and forest fragments along the way, and how they interact with obstacles such as open farmland and roads. Evidence of foraging was more often observed near forest fragments than open areas. While levels of habitat preference varied among individuals, forest was consistently selected over open areas throughout their commutes over farmland. 50% of the radio tracked bats were commuting directly between Pikiariki and Waipapa, while a further 25% were deemed to forage or rest throughout the trip.

These results confirm that short-tailed bats utilise marginal habitats on private land, suggesting a need for the implementation of safe pest control in areas near known colonies on both public and conservation land. Stronger toxins are often used on private land so the risks to short-tailed bats could be higher. The results also provide information on how short-tailed bats make use of a fragmented environment, and whether we need to create forest bridges across open farmland to assist the nightly commute of bats.

This research was carried out under the permission of the Department of Conservation (permit number 57676-FAU) and the Massey University Animal Ethics Committee (protocol number 17/35). This was also conducted under the permission of local Iwi Te Maru o Rereahu.

Lesser short-tailed bat, Pureora Forest Park

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