

Quantifying the effects of wildlife crossing structures on the population viability of arboreal mammals

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The construction of new roads and widening of existing road corridors subdivide remnant habitat patches, limiting the movement of wildlife through the landscape. Arboreal mammals are particularly vulnerable to these impacts, as they are limited in their ability to cross large gaps in canopy cover. In south-east Australia canopy bridges, gliding poles and vegetated medians have been used to provide connectivity for arboreal mammals across a major dual-carriage highway. However, the impacts of these structures on population viability have not been evaluated. This project aims to quantify how effectively these crossing structures are able to maintain or restore connectivity and normal population processes. Prior to mitigation, radio-tracking and genetic studies showed the dual-carriage highway was a barrier to multiple species of arboreal mammal. Furthermore, estimations of the annual survival of the Squirrel Glider (*Petaurus norfolcensis*), a threatened species of arboreal mammal, revealed that the annual survival rate for populations living alongside the highway was 60% lower than for populations living further away. As a result, in 2007, canopy bridges and gliding poles were retrofitted at sites where the barrier effect was greatest. Gliding poles and canopy bridges were also used along a recently widened stretch of highway (completed in December, 2009). At these sites, monitoring surveys on arboreal mammal populations were regularly conducted throughout the construction process, beginning in late 2007 at the pre-construction phase. Monitoring of some of the earlier canopy bridges and glider poles using remotely triggered infrared cameras has already revealed regular use by multiple species (e.g. Squirrel Gliders use the canopy bridges at an average rate of 0.45 crossing per night). Post-construction and mitigation data on population density, survival and genetic structure will be compared to data collected at earlier phases to determine the extent to which the viability of arboreal mammal populations has changed as a result of the highway duplication and implementation of mitigation structures.