



Using Rainforest Research

Why did the ringtail cross the road?

April 2002

Because there's now a simple and safe way to do so - thanks to the efforts of Rainforest CRC student Nigel Weston. Road kills are an obvious and tragic result of vehicle-wildlife interactions where animal habitats have been fragmented by roads. However, there is also concern about the less obvious effects of roads on rare species that do not readily move at ground level. This led Nigel to base his Masters study on the value of canopy bridges across roads in the Wet Tropics.

The rainforest ringtails

Canopy bridges are not a new concept, and have been used to assist the mobility of squirrels in Britain, and monkeys in Kenya, Brazil and Belize. The arboreal animals with most to gain from such structures in the Wet Tropics are definitely the possums, and the ringtails in particular. Rainforest ringtail possums are endemic to the Wet Tropics region. Species include the beautiful green ringtail (*Pseudochirops archeri*), the imposing Herbert River ringtail (*Pseudochirulus herbertensis*), its close relative the Daintree River ringtail (*P. cinereus*), and the acrobatic lemuroid ringtail (*Hemibelideus lemuroides*). The first three are restricted to areas generally above 400 metres altitude, with the lemuroid further restricted to areas above 800 metres. Rainforest ringtails are listed as *rare* under state nature conservation legislation, and as *near threatened* by the World Conservation Union.

Right: The original canopy bridge installed near lake Tinaroo by Rupert Russell in 1995

Causes for concern

The effects of fragmentation on ringtail possums were first documented by Dr Bill Laurance in a former CRC landmark study on the Atherton Tablelands in the mid 1990s. This study found that in fragmented forest, the naturally abundant lemuroid ringtail declined by more than 97 percent within 35-60 years in 40-80 hectare fragments, and within 9 years in smaller fragments.

Fragmentation of habitat poses a very real threat to species survival. Cleared land around forest fragments can constitute a barrier to the introduction of new genes which then leads to inbreeding and eventual extinction of isolated populations. Dr Laurance found a patch of over 600 hectares, cleared relatively recently, which was

totally devoid of lemuroid ringtails. The fact that the lemuroid rarely ventures onto the ground, means that even roads and powerline clearings can pose this kind of threat to the species.

The first bridge

In 1995, Rupert Russell, a well known local conservationist, installed the first canopy bridge in the Wet Tropics over a disused logging track in rainforest near Lake Tinaroo, with the aid of FNQEB and WTMA. The bridge remains in place today, but was unmonitored until early 2000 when Nigel began work on his study. Using this well-established bridge as his first study site, he set up infrared cameras and scat nets to determine which animals were using the bridge.



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The Rainforest CRC is a research partnership involving the Commonwealth and Queensland State governments, the Wet Tropics Management Authority, the tourism industry, Aboriginal groups, CSIRO, James Cook University, Griffith University and The University of Queensland



Above: Infrared camera shots of animals crossing the canopy bridge. Centre: Melomys, Left: an adult Herbert River ringtail and right: a juvenile of the same species (Camera: Nigel Weston)

By mid 2000, he had evidence of lemuroid, Herbert River and green ringtails, melomys and long-tailed pygmy possums having been on the bridge. Spotlighting was then used to confirm that these animals were actually using the bridge to cross the road. A data logger was also installed on the bridge to count numbers of animals crossing.

Time to modify

The design of the initial bridge was like a rope tunnel, to offer some protection from aerial predators. However, in all the photographic evidence and spotlighting observations, animals preferred using the top of the structure to traverse the road. Only one animal was observed inside the tunnel, but this seemed mostly an attempt to avoid the data logger. Armed with this new knowledge, and the support of both Main Roads Department and Australian Geographic, Nigel set up modified bridges at two further sites on the Atherton Tablelands. These new bridges were simplified to resemble simple rope ladders, a design that greatly decreased the costs of both construction and maintenance.

Gaps that need bridging most

The two new sites were very different. The first re-designed bridge was installed in December 2000 in a well-forested area near Millaa Millaa. This site was surrounded by many natural connections between trees across the road and there was already a good deal of animal movement through this canopy before the bridge went in. Little activity was observed on this bridge over the following months.

The second site was over a gazetted road - the Old Palmerston Highway, where no natural connections occurred resulting in little or no animal movement across the road via the canopy. At 15 metres, this bridge was twice the length of the original bridge installed by Rupert. It took a mere five months to find conclusive evidence that the new bridge was being regularly used by lemuroid and Herbert River ringtails, as well as the coppery brushtail possum.

Implications for Conservation

Clearly there is no need for canopy bridges over roads which retain good canopy coverage. There is, however, good cause for their installation where there is no natural connection between trees for arboreal animals to traverse a road or other linear clearing. In Britain, their installation and specification for the protection of squirrels is firmly entrenched and they are now both a standard feature of road construction and a common sight in the landscape in the north and south where the native red squirrel is still abundant. There may be an equally strong case for their inclusion into roads construction policy in the Wet Tropics to protect and foster the free movement of our rainforest ringtail possums and other arboreal species.

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