



Using Rainforest Research

Faunal Underpasses: assuring animal safety on Wet Tropics roads

March 2002

With increasing numbers and usage, roads through the Wet Tropics World Heritage Area now present a real problem to ground-dwelling animals that inhabit the forest. Besides the more obvious effects of road kills and traffic disturbance, road verges and surfaces constitute such harsh contrasts to the natural forest environment that they can become partial or complete barriers to animal movement for some species. While the concept of underpasses to alleviate this problem and assist animal mobility is not new, their effectiveness in the rainforest environment was unknown until recently. Rainforest CRC researcher, Dr Miriam Goosem, worked with the Main Roads Department and the conservation community to design and construct trial road underpasses during a major upgrade of the East Evelyn Road.

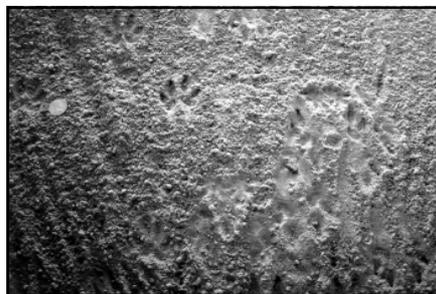
Photographs from top to bottom:

The exterior of one of the underpasses showing through to the other end (photo: Jonathon Monro).

Infra-red cameras snap shots of tunnel users at night.

The Boobook owl (*Ninox spp.*) which roosted inside the tunnel for several weeks (photo: Jonathon Monro).

Animal tracks in the sand indicate which animals are using the underpasses at ground level.



The trial environment

This road traverses a significant area of rainforest on the Atherton Tableland, dividing two important blocks of Wet Tropics upland rainforest. The area was well known as a hotspot for roadkills of the rare Lumholtz's Tree-kangaroo (*Dendrolagus lumholtzi*) and forms habitat for several other rare wildlife species like the Southern Cassowary (*casuarius casuarius johnsonii*) and rainforest ringtail possums.

The upgrade was designed to widen and straighten the road and eliminate hairpin bends. Works were completed in December 2001 and incorporated into the design were four underpasses—three for the use of fauna, and one for the safe passage of farmers in the area.

An achievement in collaboration

The siting, design and interiors of the underpasses were a team effort which involved highway engineers, rainforest managers, the Tree-kangaroo and Mammal Group and the Rainforest CRC. The structures are 3.4 metres high and 3.7 metres wide to allow tall animals like the cassowary to move easily, and to ensure animals at one end can see through to attractive rainforest habitat at the other end. Queensland Parks and Wildlife

Providing science for the conservation and management of Australia's World Heritage tropical rainforests.



COOPERATIVE RESEARCH CENTRE
FOR TROPICAL RAINFOREST
ECOLOGY AND MANAGEMENT





Service Centre for Tropical Restoration and the community group, Trees for the Evelyn and Atherton Tablelands (TREAT), were involved in the choice and establishment of food and cover plants to attract target animals towards the underpasses. Their revegetation created a narrow rainforest corridor across abandoned pastureland and through the underpasses to connect one previously separate rainforest block with another. Prior to the corridor, small rainforest mammals did not cross the abandoned pasture and road, leaving populations within the separate blocks unable to interbreed.

Safety inside

A major consideration in designing underpasses for animals is the potential for predators, particularly feral animals, to focus their hunting activities on the site. For this reason, large tree branches were mounted vertically from the base of the underpasses to act as escape poles for climbing animals confronted by such predators. The bottom of the underpasses is covered in soil and leaf litter to simulate the forest floor with logs and rocks placed inside to provide cover for small ground-dwelling rainforest animals. Ropes swing from the underpass ceilings to the closest trees to cater for tree-dwelling species, and as the rainforest trees planted at the underpass entrances

grow, so will the potential for such species to use these ropes.

Does the system work?

According to the evidence so far—yes. Tracks found in sand centrally placed across the underpass floors are examined regularly to determine which animals are using the structures. Brushtail Possums (*Trichosurus vulpecula*), bandicoots, rodents, and the Red-legged Pademelon (*Thylogale stigmatica*) have all left their tracks behind. In addition, birds including the Buff-banded rail (*Gallirallus philippensis*), brush turkey (*Alectura lathamii*), Lewin's honeyeater (*Meliphaga lewinii*) and the Crimson rosella (*Platycercus elegans*) have been seen running or flying inside the underpasses and a Boobook owl (*Ninox* spp.) roosted there for several weeks. Occasional tracks of both cats and dogs have also been recorded but these have declined over the past year. Signs of use by rare target species are not expected until the rainforest corridor is well established.

Further refinements — greater safety

In the vicinity of the underpasses, roadkills have been rare since their installation. The recent death of a Tree-kangaroo nearby however, highlighted another consideration where animal safety around roads is concerned. It appeared that the

presence of a steep embankment on the new road did not allow the animal to escape oncoming traffic. Such steep embankments without terracing can trap animals on the road surface and in future, such slopes along the new road will include planted terraces to provide an escape route for trapped animals.

Implications for conservation

Although underpasses may help to mitigate some of the impacts of roads, the best option is obviously for new roads to avoid natural habitat as much as possible. Where this is not possible however, uniting engineers, ecologists and the conservation community in the early planning stages around a common conservation goal, certainly increases the likelihood of a successful project. While the underpasses are currently in use by a number of rainforest species, use by rare and endangered species has yet to occur but they will continue to be monitored by Dr Goosem for a further three years.

For further information:

Dr Miriam Goosem
Tropical Environmental Studies
and Geography (TESAG),
James Cook University, Cairns
Phone: (07)4042 1467
Facsimile (07)4042 1284
Miriam.Goosem1@jcu.edu.au

