



Using Rainforest Research

Lumholtz's Tree-Kangaroo: Conserving a rare marsupial

May 1999

We know a great deal about the koala and other cute creatures of Australia, but tree-kangaroos are elusive animals that keep well hidden in the rainforest canopy and have maintained a degree of mystique. Tree-kangaroos are rare where they exist in the tropical rainforests of Australia and New Guinea, relying on the fragile and swiftly diminishing tropical rainforest environment for their survival. As land continues to be cleared for crops and grazing, it is important to understand their ecology so we can conserve these rare arboreal marsupials. How does the tree-kangaroo respond and adjust to changes in its environment, such as land clearing, and which specific dangers pose the greatest threat to its survival?

Graeme Newell began his search for answers during a post-doctoral

fellowship at CSIRO's Tropical Forest Research Centre in Atherton, Queensland. His study focussed on Lumholtz's Tree-kangaroo (*Dendrolagus lumholtzi*), one of only two species of tree-kangaroo in Australia. Found only in the tropical rainforests and adjacent forest communities of North Queensland, Lumholtz's Tree-kangaroo lives in rugged and inaccessible rainforest areas including within forest remnants on the Atherton Tableland. These isolated forest blocks provide an important setting to study how these rare animals survive in a fragmented landscape.

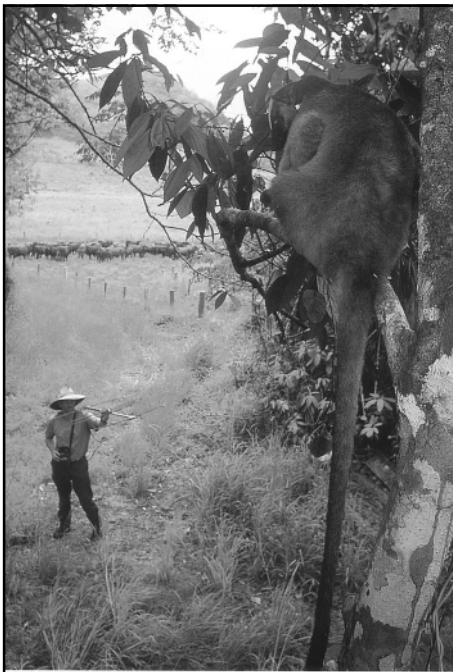
Objectives of the research

Graeme wanted to find out: how the resident animals used their habitat; whether they moved regularly to other fragments nearby; which tree species they preferred to use and which other

features of the environment were required. This information would assist in identifying high-quality forest areas for their future conservation, and be incorporated into local tree-planting schemes to accommodate more tree-kangaroos in the future.

Playing hide and seek

The study site chosen was well-known to locals for its population of tree-kangaroos. The 20-hectare block of mixed remnant/regrowth forest was on private land near Yungaburra on the Tablelands, about 70 kilometres inland from Cairns and 760 metres above sea level. Tree-kangaroos may be easily stressed by capture, and to reduce the chance of this, the animals were anaesthetised while radio collars were fitted. Darting the animals proved successful and soon Graeme was collecting data on between seven and ten animals at any one time, using a hand held antenna and telemetry receiver. He recorded time of day, position in the forest and the species of trees and vines each animal was



Left: Graeme Newell radio-tracks an adult male tree-kangaroo (photo Peter Trott)

Right: Graeme fitting a radio-collar to an anaesthetised tree-kangaroo. Animals recover within two hours and are released at the same site they were captured (photo Graeme Newell)

Below: Loss of habitat from land clearing represents one of the greatest threats to the tree-kangaroo's survival (photo Peter Trott)



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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

associated with. This enabled him to establish how much space the animals used, how the animals interacted with each other and which tree species the animals used regularly.

Graeme found that even with radio-signals identifying the presence of a tree-kangaroo in the tree canopy, they often remained invisible, sometimes in quite sparse foliage - a very clear indication of just how cryptic they can be.

Responding to a changing environment

After several months the study took a dramatic turn when the landowner informed Graeme he would be clearing half the forest block for grazing. While the results were likely to be distressing for both the tree-kangaroos and the researcher, this provided a unique opportunity to observe how arboreal animals responded directly to loss of their habitat. It seemed logical land clearing would force these tree-dwelling, shy animals to seek out new home ranges. The results were surprising.

Five male and six female collared tree-kangaroos whose ranges fell within the 10 cleared hectares did not move away from the area. Instead they continued to use their original home range despite the area having been flattened by the bulldozer. While the tangle of fallen trees provided somewhere to live and protection for some from predators, others quickly fell prey to dingoes and dogs.

Those that escaped predation had other dangers to contend with, such as a diminished food supply, and would likely need to eat potentially toxic

plants rather than their standard fare of leaves from rainforest trees and vines. Overall, it became obvious that Lumholtz's Tree-kangaroos were very reluctant to leave their homes, except perhaps for young male animals yet to establish a permanent home range.

A clearer picture emerges

The study found that Lumholtz's Tree-kangaroo:

- shows an apparent preference for trees such as Black Bean or Moreton Bay Chestnut, Candlenut, Grey Bollywood and Milky Pine, and the spiny vine known as Cockspur Thorn;
- uses small home ranges within the forest fragments - females generally maintain exclusive and non-overlapping ranges of around 0.7 hectares, while males roamed over an average of 1.8 hectares, which could overlap several female and male ranges;
- become vulnerable to predation, loss of condition and starvation, as well as other causes of fatality, once clearing occurs;
- are highly territorial animals that are reluctant to abandon their home ranges following a severe disturbance. This may suggest that relocating tree-kangaroos into forest blocks with existing tree-kangaroos could lead to conflict between the animals, but this requires further investigation;
- mostly live a sedentary life. Males occasionally move between forest blocks, possibly following antagonistic encounters with other males, but females rarely move from their home patch. This has been reinforced by recent genetic test results

conducted on the animals at this fragmented study site which show the female tree-kangaroos are all related to either of two original 'founder' female tree-kangaroos.

Issues for conservation

Three important issues stand out in species conservation:

Road deaths are frequent in some areas as the animals move between forest areas, accounting for the loss of up to a dozen animals per annum - a significant number when viewed in terms of their apparent low rate of reproduction, in addition to loss from other causes.

Increased control of predators such as dingoes and dogs may be necessary in areas adjacent to tree-kangaroo habitats, especially when these habitats are near residential areas.

Relatively small plots of rainforest on freehold land, unallocated State Land and land controlled by Local Shire Councils or other government bodies may provide important habitat for tree-kangaroos.

A more effective strategy in promoting tree-kangaroo populations may be the revegetation of suitable areas not viable for agriculture, providing corridors between strategic blocks of preserved forest fragments.

For further information:

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