Rainforest CRC Cooperative Research Centre for Tropical Rainforest Ecology and Management

PROJECT 6.4
Impacts of climate change on Australia's rainforest marsupial folivores

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Australia's rainforest marsupial folivores are considered to be among the organisms most seriously threatened by climate change (Climate Action Network 2002), due to their limited geographical ranges and specialised habitat requirements. Moreover, the extant rainforest folivores are mostly cold-adapted relicts of a much larger assemblage, due to pleistocene rainforest contractions. This makes them particularly susceptible to the direct effects of global warming.

This project will develop distributional models for the rainforest marsupial folivores based on the mechanisms limiting their distribution. These mechanistic models will be used to predict the effects of climate change on distributions under a range of climate change scenarios, enabling resource managers to design ameliorative strategies. At present it is not possible to develop these models because we do not understand the mechanisms that limit distribution and abundance of rainforest marsupial folivores. Without information on mechanisms we are dependent on models that rely on correlation between distribution and current climate, which cannot be reliably predictive of either the end result or time course of impacts. This project is desgned to test and specific limiting mechanisms, using that data to parameterise mechanistic predictive models.

We will develop models of the extent and time course of impact of climate change that are based on ecological and physiological mechanisms limiting distributions of rainforest marsupial folivores. It is complementary to the correlational approach proposed by Hilbert and Williams (Project 2.5) for developing distributional models of rainforest endemic vertebrates, and it is intended these projects will contribute information to each other.
The proposed project directly addresses several goals of Program 6- "discover processes producing patterns of biodiversity", "predict the geographic distribution of rare, endangered and vulnerable species" and "assist management in setting priorities".

POSTGRADUATE STUDENTS

Frédéric BEAULIEU (UQ) PhD
Biodiversity of mites (Acari) in rainforests

Sarah BOULTER (GU) Hons
The insect visitors and pollination ecology of two canopy plant species from the Australian Wet Tropics
Katherine JONES (JCU) PhD
The role of plant secondary metabolites on intraspecific diet selection by the green ringtail possum
Romina RADER (JCU) Masters
Vertical distribution of rodents and their interaction with canopy resources
Terry REIS (GU) Hons
Biogeographical concordance in old world rainforest at the continental and local scale