



# Using Rainforest Research

## Ears wide open - are rainforest possums affected by human noise?

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Noise can be a nuisance that masks sound we want, or indeed need to hear. Humans create noise that is alien to rainforest wildlife including sounds from traffic, recreational activity, gun-fire, logging and farming equipment. The two most common sources of human noise in the Wet Tropics rainforest are traffic and recreational activities. These sounds have been detected up to one hundred metres into the forest.

Because visibility is restricted to about ten metres within the forest environment, many marsupials depend in part on auditory information for their safety and social communications. With recreational noise typically intermittent, fluctuating and often sudden, it is not easily grown accustomed to and so Robyn Wilson examined the effects of noise disturbance on north Queensland rainforest possums as part of her PhD studies.

### Objective of the Study

The aim was to determine if sounds associated with human visitors disturb rainforest possums, and whether or not they grow accustomed to these sounds by observing their behavioural responses at night. She studied four endemic nocturnal species: the Lemuroid Ringtail (*Hemibelideus lemuroides*), the Herbert River Ringtail (*Pseudochirulus herbertensis*), the Green Ringtail (*Pseudochirops archeri*) and the Coppery Brushtail (*Trichosurus vulpecula johnstoni*).



Coppery brushtail alert to approaching humans

### Re-creating appropriate noises

Seven sounds associated with human recreation were recorded when forest vegetation was dry:

- twigs snapping
- people walking on dry leaves
- gravel scrunching underfoot
- car door slamming
- vehicle starting and running
- micro-cassette clicking
- adult human voices

Two sounds associated with the forest were also used as part of the study:

- the movements of possums in the forest
- the call of the Rufous Owl, *Ninox rufa*

Human sounds were recorded for five seconds at thirty second intervals over five minutes and used as playback calls to simulate the pattern of sounds produced by tourists observing possums. Movements of arboreal mammals in the forest were available in-situ and did not need to be reproduced.

The Rufous Owl call was reproduced from a commercial tape, commencing with the territorial or contact call of the adult female, followed by that of the adult male, repeated three times during the five minute period.

### Known responses to noise

Short-term responses to noise in mammals are known to vary depending on their intensity and frequency, the animal's disposition and its previous exposure to the disturbance. An increasing scale of responses are:

- *no obvious response*
- *mildest response* - ear movement, briefly alert posture and brief displacement behaviour
- *mild aversion* - walking slowly away, freezing, crouching, mild aggression and increased social cohesion between adults and infants or between adults
- *increasing aversion* - increased movement away, biting, kicking or hiding in dens and hollows
- *intense aversion* - panic, urination, defecation, a very rapid retreat and death feigning.

### Observation in the field

Possums located at sites commonly used and rarely used for nocturnal possum viewing were observed with a 6 watt headlamp. The behavioural response of each individual possum was recorded at thirty second intervals over five minutes using the five sample responses.

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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

### Responses of Possums

The results were then analysed to determine if there was any significant difference in behavioural responses of the four species to either human versus forest sounds, or to impulse (sudden) versus non-impulse (gradual) sounds at two different site types. Robyn noticed that all species were:

- more disturbed by noise at sites used rarely by humans
- initially alert to animals moving in the vegetation but this lessened over time
- strongly responsive to scrunching gravel, twigs snapping, and sliding van doors; intermediate to cassette clicking and engines running; but tended to ignore human voices
- either alert to or ignored the Rufous Owl
- more agitated by impulse than non-impulse sounds
- greatly disturbed by scrunching gravel which elicited the most intense responses: panic, urination, defecation, a very rapid retreat, and was strongest at sites rarely visited.



Above: A Herbert River Ringtail turns and runs from a person stepping on twigs and leaves and below left: raised in preparation to flee from screech of a sliding van door

Further interesting species specific responses were noted:

- The Lemuroid Ringtail was more likely than the other possums to respond negatively to both forest and human sounds at both types of site.
- The Coppery Brushtail was twice as likely to ignore sounds at both types of sites, suggesting it was accustomed to human sounds.
- The Coppery Brushtail and Green Ringtail appear more tolerant of repetitive impulse sounds than the other two species.
- Coppery Brushtails are attracted to some of these sounds at sites visited commonly but run away from them at sites visited rarely.

### Useful tips for tour guides and possum researchers

- Avoid gravel tracks and walking on dry leaves and twigs while spot-lighting or doing research on possums.
- Normal adult voices are OK, but loud voices or shouts should be avoided.

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