THE FEEDING ECOLOGY OF THREE SPECIES OF NORTH QUEENSLAND UPLAND RAINFOREST RINGTAIL POSSUMS, *HEMIBELIDEUS LEMUROIDES*, *PSEUDOCHEIRUS HERBERTENSIS* AND *PSEUDOCHEIRUS ARCHERI* (MARSUPIALIA: PETAURIDAE)

Thesis submitted by

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the Department of Zoology at

James Cook University of North Queensland.

DECLARATION

I declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education. Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.

Nicole J. Goudberg

June 1990

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June 1990.

Frontispiece: Climbing to catch possums in their dens. (Steve Williams photo).

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ABSTRACT

The feeding behaviour of three species of upland rainforest ringtail possums (*Hemibelideus lemuroides*, *Pseudocheirus herbertensis* and *P. archeri*) was studied in the field for 30 months in 1982, 1983 and 1985. They were found to be selective folivores, choosing diverse diets that changed with the phenology of favoured food species. Mature leaves constituted the bulk of the diet of *P. archeri* and *H. lemuroides*, while *P. herbertensis* ate more young leaves. Tree species and seasonal food items (young leaves, fruits, flowers) were not exploited in the same proportion in which they occurred. Rather, condensed tannin and fibre content determined whether they were included in the diet. Protein was not an important correlate to species feeding preferences although *P. herbertensis* selected a higher protein diet than the other species. *H. lemuroides* selected for a low fibre diet, and *P. archeri* selected for high fibre.

Both *P. herbertensis* and *P. archeri* preferred to feed on continuously leafing tree species. The diets of all three species became more specialized during the more difficult dry season, and became increasingly opportunistic during the wet season when there was more suitable food available. Foods were partitioned almost completely at the species and item levels. No interference competition for food between or within the three possum species was ever observed.

The field energy requirements of *P. herbertensis* and *H. lemuroides* were determined by the doubly labelled water method during September-October 1985 (spring). Although both rainforest species have a similar food intake, *H. lemuroides* uses more energy for free existence than *P. herbertensis*, and obtains extra energy from a significantly higher quality diet than *P. herbertensis*. Behavioural adaptations reduce the energy needs of all three species.

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