Interim Report to the Rufford Foundation

The need to feed: hunting in second-growth forests of the Brazilian Amazon

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March 2006

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General Project Performance

This report provides an overview of the research activities conducted during this project. A brief summary and timeline of publishing and presenting outputs is also outlined. A final report will be prepared over the coming months and submitted to the Rufford Foundation for examination and approval. Overall, we are very pleased with the progress and achievements of our research project and strongly believe that we have undertaken cutting-edge research that will offer real insight into conservation in the tropics.

1. Fieldwork

1a. Game Harvest Surveys

The game harvest study, in which we monitor all hunting activity in four study communities, appear to have been very successful. Our original intention had been to work with six communities though it proved beyond the scope of manpower and financial resources. We decided that undertaking good research in four communities was preferable to poor research in six.

Our dataset will allow for in-depth analysis – we recorded over 1500 hunts, and over 14,000 kg of bushmeat.

The villagers of Bananal, Sao Militão, "127" and Vila Nova have shown great enthusiasm for the project and appear to be thinking more seriously about their impact on wildlife populations. The significance of this (as compared to "drier" scientific outputs of the project) should not be underestimated. Our study has shown that all four of the communities are hunting and obtaining bushmeat from all of the landscape habitats; primary forest, secondary forest (post-plantation); secondary forest (post-agricultural); active eucalyptus plantations, and active agricultural small holdings. The fact that tapir, a species widely thought to be restricted to primary forest, use secondary forest and pass through plantations is of considerable interest.

Primary forest remains the main source of bushmeat. However, the hunting pressure from a given habitat is not necessarily a consequence of wildlife abundance. There are three issues at play:

    i)   The **spatial coverage** of each habitat type around a village.

    ii)   **Productivity** of wildlife in each habitat type.

    iii)   Hunter preference – response to the **physical characteristics** of each habitat.

    iv)   Hunter preference – response to the **opportunity costs** of hunting in a given habitat. E.g. during the Brazil nut season there are high incentives to be in primary forest, irrespective of wildlife to hunt. During that time hutting is more opportunistic and success comes from chance encounters whilst primarily pursuing another extractive activity in the forest.

Analysis of the game harvest data is complex and on-going. However, interestingly it seems that young secondary forest could be "under-hunted" by some communities. Possibly due to the closed physical nature of the habitat or the lack of other extractive resources that can be harvested simultaneously in this habitat. Either way, it appears that there will be important implications for wildlife conservation and local livelihoods in fragmented landscapes.

1b. Predator-prey line transect surveys

These have been conducted successfully in all sites, generating c.375km of line transect data. Analysis is pending though initial results would suggest that densities of certain species such as red brocket deer (*Mazama americana*), agouti (*Dasyprocta agouti*) and armadillos (Dasypus) are at extremely high densities in secondary forest. Low encounter rates means that some species such as tapir and jaguar, we will be limited to generating track data (tracks/10 km walked) rather than absolute densities per km^2, for example. However, track densities were surprisingly high for these species of conservation concern and we look forward to completing data analysis.

1c. Semi-structured interviews

These have been conducted in each of the three study communities. They have provided important information regarding issues such as attitudes and preferences towards hunting in different forest types, for example. I have also been able to obtain information relating to the effects of large-scale plantation management on the quality of eucalyptus as wildlife habitat and as hunting habitat.

1d. Spatial data collection:

i) *Ground-truthing hunter kill locations*
I worked with a number of hunters from each community on returning to the sites of recent kills and obtaining spatial coordinates using a GPS.

ii) *GPS-based mapping of local forest areas.*
We aimed to re-create in a Geographic Information System (GIS) a copy of the cognitive maps that already exist in hunters' heads. This has been completed for all three study communities. Spatial knowledge was more complete in primary forest as there was a strong familiarity with Brazil nut groves and area divisions as these marked the boundaries of families' Brazil nut concessions. Once fully entered into a GIS, this data should allow for a catch-per-unit-effort because the local forest names were recorded or kills within the game harvest study. This should allow us to look at questions such as game depletion with distance from the community etc.

2. Outputs

2a. Once analysis and data interpretation is complete, manuscripts will be written and submitted to major international conservation journals. A minimum of two conservation science articles are expected. In addition, a minimum of one of the articles will be translated into Portuguese and submitted to a Brazilian journal such as *Natureza e Conservação* (Nature and Conservation). We also envisage one article looking more closely at the human livelihoods implications of the work. A suitable journal could be *Human Ecology* or *Environmental Conservation*.

2b. L Parry presented very early provisional results and a summary of the project to two major international conferences in 2005 - the annual conference of the *Society of Conservation Biology* in Brasilia, and the annual conference of the *Association of Tropical Biology and Conservation* in Uberlandia, Brazil, in the July 2005. All feedback received was very positive and encouraging.

2c. L Parry recently presented a talk (13 February 2006) to the *Zoological Society of London* in which provisional results and conservation implications of this study were presented and discussed with a range of bushmeat experts such as Dr Marcus Rowecliffe and Dr Guy Cowlishaw. Feedback received was very positive. L Parry also presented the findings again to the *Centre for Ecology, Evolution and Conservation* at the University of East Anglia in March 2006. The support and role of the Rufford Foundation has been (and will continue to be) acknowledged in all talks and articles.