Project Update: November 2010

Overall, the season was an amazing success despite numerous logistical challenges including flash floods and tropical storms which interfered with some of our equipment. Over the course of the project, we collected hundreds of samples from a variety of sources to be tested for amphibian chytrid fungus. In total, we were able to filter nearly 120 l of water by hand in order to reveal the environmental distribution and density of amphibian chytrid fungus across the landscape. This water was collected from 48 bromeliads (which were then fully dissected to visually confirm the presence or absence of amphibians at the time of water filtering), 24 different river localities, and 21 buckets of rain water captured in a high elevation dwarf forest.

Climbing the trees to reach some of the higher bromeliads was an invigorating experience and we are very excited to see what this data will show. Never before has such an extensive array of water samples been tested and we hope to learn a great deal from these results. In addition, 464 amphibians were swabbed for chytrid infection, and six adult *Plectrohyla exquisita* were radio tracked throughout the season to consider their role in the dispersal of this pathogen. We had also planned to radio track a group of *Plectrohyla dasypus*, but unfortunately this species was not present in sufficient numbers at our study site n, as it had been in previous years. Although too soon to determine whether this apparent decline in adult *P. dasypus* may be attributed to chytridiomycosis, it certainly raises concern. For a third consecutive year we found amphibians in Cusuco National Park exhibiting abnormalities, including missing digits and feet. In addition, we observed an unusual instance of parasitism in which a large worm could be seen within the thigh of an adult male *P. dasypus*.

The most exciting part of our project was the fabrication of a 2-dimensional array of sampling equipment suspended across a river and reaching 20 m skyward. The array was anchored between two trees situated 20 m apart on either side of a river and designed to collect airborne water particles for chytrid fungus detection. In order to carry our lines across the river valley and bridge the gap between the trees, we modified a compound bow and arrow to fire the lines from tree to tree. Five lines spanned the 20 m gap between trees, each line affixed 5 m above the line below, at heights of 0 m, 5 m, 10 m, 15 m, and 20 m above the river's surface. On each of these five lines, 10 aluminium screen cubes were drawn across the 20m gap and left suspended. Each aluminium cube contained a sheet of filter paper suspended within the cube to sample airborne water particles which were either swept upwards from the surface of the river, or precipitated down to the ground during weather events. Once a week for 5 weeks, two of us simultaneously ascended both trees and manipulated the lines to methodically collect two samples from each tier. In 2009, we confirmed the presence of chytrid at this river location through amphibian swabbing surveys.

All of the amphibian chytrid fungus samples collected this season will be processed by PCR analysis for the detection of chytrid DNA and we will hopefully have results within the next couple months. At that time, we will be able to begin the process of data analysis and work to determine how we can apply these results to better protect the critically endangered amphibians of Cusuco National Park. We are very excited to see what our samples will

teach us since this study now represents the most comprehensive investigation of its kind. I hope that these data will also help to decipher the mechanisms by which chytrid is able to disperse away from rivers, enter the forest, and ascend into bromeliads, with implications applicable towards unlocking the secret pathways of global dispersal.

All in all, we had a very exciting season and I hope for especially exciting results. On behalf of my research assistants and myself, I thank you deeply for your support which made this project possible.