Pumilio Habitat Monitoring Program

Abstract
The Caribbean Coast of Costa Rica is home to a plethora of reptiles and amphibians in it's tropical moist and tropical wet forests. Known locally as the blue jean frog, Oophaga *pumilio* is one of the most photographed amphibians in Costa Rica. There are speculations as to where the different varieties of colors come from (at least 16 color varieties alone in Bocas del Toro, Panama) Haas, Et al. (2003) speculate that it comes from alkaloids in the skin toxins. Abundant throughout Central America, the *pumilio* dart frog is an ideal candidate for field studies.

Introduction
The Florida International Teaching Zoo's Project Green Jungle is endeavoring on a broad scope project which will collect previously unknown behavioral, breeding and tadpole rearing data on the dart frog, as well as many other species of frog.
The project will strive to include the zoological and nonprofit world, the private sector and local, national, and international governmental agencies.
Project Green Jungle has teamed up with the Red Frog Team to create a long term habitat monitoring project. Red Frog Team is comprised of a group of individuals with the common goal of conserving the reptiles and amphibians of Costa Rica and Panama. They have been in Costa Rica for three years, collecting environmental data at multiple sites throughout this region. Currently, we are compiling the last three years data, for entry into our website. Members will be able to see complete data. Currently they have representatives in Costa Rica, near Project Green Jungle headquarters.

Experimental Approach
Description of Study Areas

Finca La Isla Botanical Garden

Located 500 meters away from Black Beach, just outside Puerto Viejo de Talamanca. Finca La Isla Botanical Garden is a permaculture farm that was once a cacao plantation. It is an ideal site for an abundance of Oophaga pumilio.

Caribeans Jungle Property

Located about 600 meters south of the coastline, at approximately 100 meters elevation. This property is a decommissioned cacao plantation which has since overgrown with secondary growth. The Trees are still producing fruit, although it is not viable for commercial purposes. The ground is covered with cacao leaves, and has multiple springs and a creek through the property. This property is considered ideal for finding pumilio dart frogs.

Hitoy Cerere Biological Reserve

Located around 55 kilometers northwest of Puerto Viejo, Hitoy Cerere Biological Reserve is located in the Talamanca Mountains. The property is 20,000 acres of Primary and Secondary Rainforest which sees 4000-6000 mm of rainfall a year. The property is managed by SINAC, a division of MINAET.

Kachabri, Indigenous Reserve

The Village of Kachabri is located at the end of the road on the Western side of the Sixaola River. The Indigenous village is surrounded by primary and secondary forest, and has not had any long term biological surveys conducted.

Each Area will have the following data included:

Population Size

Plot Size

$100m^2$ plots roped off

Environmental variables and microhabitat of each plot site

Water quality of Tadpole rearing sites

Ammonia, nitrates, nitrites, dissolved oxygen, total dissolved solids, conductivity, salinity, alkalinity, phosphates, pH, temperature

Type of Flora in plot

Type of Fauna in plot

Measurement and photograph of all Oophaga pumilio's in plot

Snout to vent, weight, photograph, sex determination

Count Tadpole rearing Sites

Process of Collecting Data

ID and Location of population

Measuring Population Size

Demarcating suitable plot

Catching all Oophaga pumilio

Photographing, measuring, and sex determination of each individual

Release of frogs back to original location

Measuring environmental variables

Data Analysis

Data will be presented in our professional membership level. Raw data will be available in a variety of formats, including but not limited to:

PDF, Excel, OpenOffice, Word, and html.

Accompanying articles, press releases and Marketing material will accompany the Raw Data for use by our Professional Members.

Project Timeline

May and June 2011

Fundraising

June thru December 2011

Data collection from all four sites. Each Site will be checked a minimum of once a month.

July thru March 2012

Data analysis and report writing.

Calculation of Costs

Rental of House (x6 months)	$2400
Transportation (x6 months)	$1800
Airline tickets (x2)	$1000
Field Supplies	$500
Shipping of Scientific Equipment	$450
Total cost of 6 month project	$14,700

Impact

Social

Data on alkalinity in tadpole rearing sites may provide information on lack of mosquito larvae in bromeliads in this region. The ministry of health currently thinks there is a connection between Bromeliads and Dengue, because of the stagnant water that sits in the Bromeliad, a common tadpole rearing site for the Oophaga pumilio, however, recently at one of our sites, Finca La Isla Botanical Garden, the Ministry of Health was unable to find mosquito larvae in any Bromeliads on property.

Scientific

Studies on the water quality of the tadpole rearing sites may show us insight into what causes color variations, and other physiologic difference in Oophaga pumilio populations at the different sites.

Zoological

Environmental variables, behavior, and reproductive data will allow zoos to replicate the natural environment like never before.

Private Sector

Responsible Commercial Businesses will benefit from the positive marketing of working with our project, they will also benefit from increased tourism to the region.

Governmental

Governmental partners benefit from collection and funding for raw data collection, as well as capacity building funds for conservation/reserve areas that participate in this project.

Environmental

Environmental conservation gains more support as more information becomes available on how important each site is.

Future Considerations

Indigenous

We have just been given approval from the Indigenous Elders to move forward with our captive breeding capacity building project with the villagers of Kachabri.

Sustainable Cacao Leaf Export

Through our commercial partner, Caribeans, we will be sustainably harvesting cacao leaves for export to captive wildlife facilities. These leaves will help create a more natural environment for *pumilio* frogs in captivity.

Adventure Volunteering

Tours for our members will be conducted at each of the four sites in Costa Rica. Eco Tourists will take part in all aspects of this project, including demarcating plots, capture and measurement of frogs, water testing, and note taking.

Strategic Project Partners

Red Frog Team
SINAC
Caribeans
Finca la Isla Botanical Gardens

Summary

In summary, the success and depth of this project relies on the strategic partners and donors with common goals, communicating with each other throughout the time line of the project. Six months of data gathering and field work will provide a wealth of knowledge as well as the infrastructure to move forward with other projects locally in and around Puerto Viejo de Talamanca, Costa Rica. More information can be found on our website: http://greenjungle.org