BELIZE FOUNDATION FOR RESEARCH AND ENVIRONMENTAL EDUCATION

THE BLADEN REVIEW 2013

Letter *from the* Executive Director

Jacob brewing the first harvest of BFREE's organic coffee

Warm greetings to all friends of BFREE,

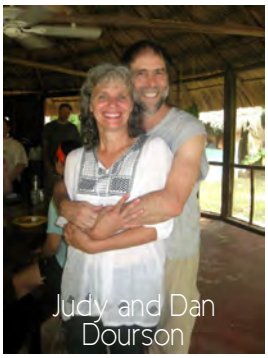
I am very excited to share this mid-year report with all of you; our members, supporters, partners, staff, and the many people who are involved with and care about our organization. In addition to the many new ways that we are working to keep you informed about what BFREE is up to, such as our monthly enews, Facebook page, website and jungle blog, this report highlights many of BFREE's activities and accomplishments in 2012-2013.

Our mission is to "conserve the biological diversity and cultural heritage of Belize." This is a lofty goal, and as conditions in Belize are always in flux, BFREE must adapt to those conditions in order to better position ourselves to have the impact we desire, to make a real and permanent difference. Our backyard, the Maya Mountains, is now considered the largest unbroken expanse of tropical rainforest north of the Amazon. As a stakeholder and active steward of this incredible tropical wilderness, we take our responsibility seriously. As the years go speeding by and our world is ever shrinking, with the loss of biodiversity, a changing climate, population growth and unbridled development forever changing the environment with consequences unknown, our work seems more urgent than ever before. The choices we make today will affect what kind of world we pass along to our children and grandchildren. For people to make informed and environmentally conscious choices, an understanding must first come through education and experience. It is my hope, for those who have had the privilege of being here and seeing what BFREE has to offer, that the experience will inspire them to make such informed choices, ones that will help change our world so that future generations will live on a healthy and vibrant planet, one we are all proud to call home.

I invite you to explore the pages within, and get a glimpse into the world of BFREE these past many months. Without the help of our donors and partners, and the tireless efforts of BFREE's incredibly talented and dedicated staff, we could not have achieved so much in such a short time. I thank each and every one of you who believes in our mission and cares about the environment as we do. Your support, however it is given, really matters, and is making a difference.

In conservation and stewardship,

Jacob A. Marlin
Executive Director



Judy and Dan Dourson

In Gratitude

After 7 years of hard work and dedication, Dan and Judy have decided to retire from BFREE in order to spend more time with their family and in pursuit of personal interests. You can still expect to see them at BFREE, though less frequently. The contributions that these two have made to BFREE and to Belize are immeasurable. Their presence will be sorely missed by people throughout the country and especially at BFREE.

Report Design by Chelsea Hetelson

Cover Photo by Paul Pickhardt. Lakeland College students leave BFREE, crossing the iconic Bladen River on their way home.

All photos by Emily McKinnon, Kevin Fraiser, Thomas Pop, Thomas Rainwater, Robert Naczi, Saira Fida, Kai Reed & BFREE staff

Time in the jungle moves pretty quickly so in case you missed it, here are a few highlights from the past year and a half.

A Quick Look Back

End of 2011

Elmer Tzalam, Cacao Farm Manager, and Heather Barrett, Dir. of Organizational Development are hired.

2012

Feb.

BFREE receives *Partners in Flight* award for bird conservation.

Lincoln Memorial University and BFREE conduct first land snail workshop.

March

Smithsonian's Migratory bird research begins at BFREE.

A retreat for BFREE's board of directors took place in Gainesville during the Fall of 2012.

April

Avian Program Coordinator, William Garcia, is included in the 2012-2014 cohort of Caribbean Emerging Wildlife Conservation Leaders (C-EWCL).

Command Central (BFREE's business office) is renovated.

May

UF Tourism Planning students draft a five-year tourism plan for BFREE.

July

Discovery of two new Harpy eagle nests – July 2012 and Jan. 2013.

Aug.

International headquarters opens in Florida.

Three birding workshops offered at BFREE to members of nearby communities.

The BFREE school (attended by the Marlin kids) is renovated and becomes "The Commons."

Harpy Eagle conservation was the focus of BFREE's environmental education programs in 2012-13. Over 750 students and adults were served.

Winona State Professor and former field course student, Jen Biederman returns to BFREE with her own students.

Columbus Zoo & Aquarium provide grant for Harpy Eagle research.

Sept.

Part-time staff Chelsea Hetelson and Katy Martin join the US office.

Oct.

BFREE partners with USFWS-NE Region to begin the Belize Cacao-based Agroforestry Program (BCARP).

Nov.

Marlyn Cruz becomes BFREE's first female avian technician.

Dec.

"Biodiversity of the Maya Mountains" by Daniel C. Dourson is published.

250 copies of Biodiversity of the Maya Mountains have been donated to academics in Belize.

2013

Jan.

Campground thatch built from renewable resources at BFREE.

Volunteer program is re-established with first participant, Rebecca Cogen.

Feb.

Work starts on three jungle cabanas.

March

BFREE hosts first graduate level field course for law students from the University of Florida.

April

Construction of three composting toilets begins.

May

Avian Tech, Liberato Pop, begins KBO bird internship in Oregon.

Turtle pond designs are modified and liners are installed.

13 Field Courses in 2012

14 Field Courses in 2013

The Wisconsin Renewable Energy Project began as the first field course of its type with Madison Area Technical College, Heartland Community College and Lakeshore Technical College.

2013 field station volunteers include: Rebecca Cogen, Kai Reed, Wilder Fichter, Nellie Cadle, and Mary Beth Tignor.

HOME
for the Hicatees

BY JACOB MARLIN
Executive Director, BFREE

The Central American River Turtle, (*Dermatemys mawii*), known locally in Belize as the Hicatee, is found only in the lowlands of northern Guatemala, southern Mexico, and Belize. This unusual fresh water species is the only living representative of a formerly widespread group of turtles from the family Dermatemydidae. Due to years of intense harvesting for its meat, Hicatee has been virtually eliminated from much of its former range. The International Union for the Conservation of Nature (IUCN) lists this species as critically endangered. In other words, they are on the brink of extinction.

As a component of a regional initiative to save the species, BFREE has partnered with the Turtle Survival Alliance (TSA). Founded by Rick Hudson, TSA is a US-based freshwater turtle conservation organization dedicated to saving the most endangered and threatened freshwater turtle species around the globe. TSA is the world leader in this effort, ad BFREE is proud to work with them to help save the Hicatee.

The goal of this collaboration is to build the Hicatee Conservation Research Center (HCRC) at BFREE to investigate the reproductive biology of Hicatee in captivity, and to test the feasibility of large scale captive management. Long-term goals include a head-start/release program, environmental education and scientific research and monitoring efforts. Construction of the HCRC began in 2011. Initial work focused on pond construction, a freshwater well, a solar powered pumping system for providing water tow the ponds, and material acquisition for infrastructure development.

"Belize Aquaculture LTD is devoted to positively impacting our surrounding social and natural environment, and through the hicatee project, we are proud to contribute to Belize natural resource preservation." – Isabelle Gayot, Belize Aquaculture LTD

Over the past year and a half, work on the facility has continued, although it was temporarily stalled during 2012 because ponds would not consistently hold water. Initially, clay was used as a natural liner, but in spite of our best efforts to seal the ponds using this material, the ponds continued leaking. Recently however, thanks to the generous assistance from Belize Aquaculture LTD, we have made great strides. This large-scale shrimp farm in southern Belize provided and installed pond liners, pro bono. The ponds are now holding water so we can now proceed to complete this phase of the project.

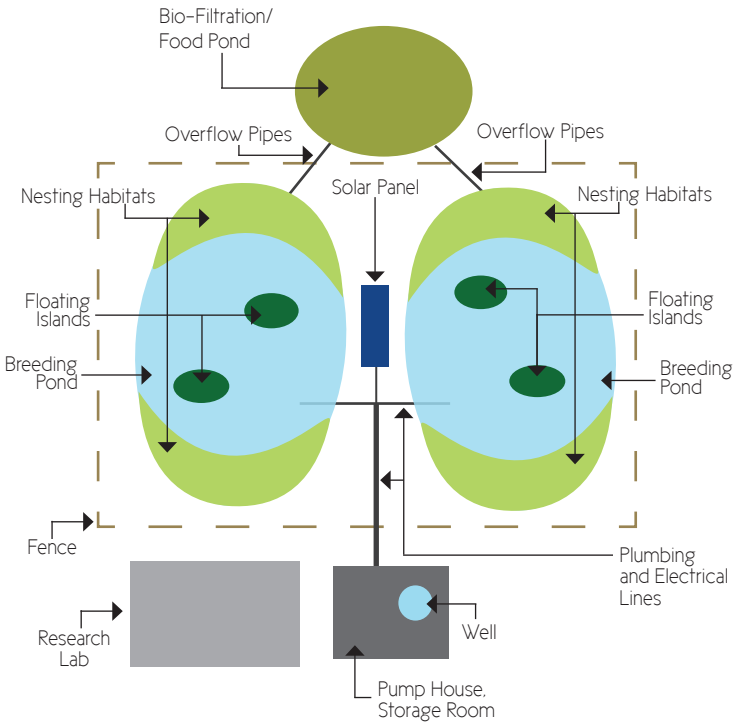
When finished, the HCRC will house close to 40 adult breeding Hicatee and all of the food plants will be raised on site. Completion of the HCRC is planned for December of this year, and we hope the facility will be fully operational by March of 2014. HCRC is now an important part of the BFREE biological field station facilities.

Belize Aquaculture LTD and BFREE staff worked together on dry days to install pond liners. Temperature during installation averaged 98°F in the shade.

Male Hicatee turtle captured during a country-wide survey conducted by TSA and BFREE in 2011. Photo by Thomas Rainwater.

Cohune thatch palm leaves are placed around the perimeter of the ponds, until natural vegetation takes hold, to mitigate any erosion that occurs during the coming rainy season.

Diagram of the Hicatee Turtle Ponds



TOILETS in the Jungle

BFREE Board Member, Rob Klinger (left), and others, demonstrate proper use of the toilets. Don't worry, there will be doors soon....

BY JACOB MARLIN
Executive Director, BFREE

I must admit I have never been so excited about a toilet! For years at BFREE we have been using good old-fashioned latrines, basically a hole in the ground for human waste. Although this works, it's not the most environmentally friendly way to deal with poop. The newly designed composting toilets will become another teaching tool for our visitors, showing that human waste can be repurposed as compost, and that compared to septic systems, this one serves as a water conservation measure.

In a world of ever shrinking natural resources, particularly clean potable water, composting human waste just makes sense. Basically, the idea is that the waste is collected in separate reservoirs under each toilet, with the liquid portion directed away from the solid waste by gravity (via the perforated PVC pipe.) Dry composting can then take place. With each deposit, a small amount of wood chips (waste from a local sawmill) will be thrown into the reservoir along with toilet paper.

Occasionally, we will add leaf litter from the forest to introduce bacteria, which will help to break down the material. Once a reservoir is filled, the stall will be closed off for approximately one year to allow the solids to completely compost. We designed these facilities with four stalls each. Only two are being used at one time, allowing the other two to compost, alternating approximately every six months. The resulting compost will be used in our nurseries and cacao farm as a fertilizer.

Improving BFREE Infrastructure

It's not easy maintaining a field station located at the end of a six-mile, muddy road deep in the rainforest hours from the nearest anything! Access is difficult, the rainy season seems to last forever, materials are hard to come by, planning is crucial! As part of our five-year Tourism Management Plan, developed in cooperation with the University of Florida, College of Health and Human Performance, Department of Tourism, Recreation, and Sport Management, we have begun to improve the facilities at BFREE so that we can provide the infrastructure necessary to host the many types of visitors who utilize the field station. Some of these improvements include:

- Improved the six-mile entrance road.
- Constructed three composting bathroom facilities.
- Designed and began construction of three private Cabanas.
- Installed liners at the Hicatee Conservation and Research Center ponds.
- Expanded "Command Central," BFREE's office space.
- Installed new solar system at the bunkhouse with LED lighting.
- Created a cacao bean fermenting and drying facility.
- Built "The Commons," a circular open-air thatch with hammocks and picnic tables.
- Added railings to the 112-foot observation tower.
- Installed phone for visitor and staff use.
- Purchased Toyota 4x4 pickup truck and Toyota 2-wheel drive pickup truck.
- Poured a cement slab for additional workspace under the Rainforest Cooperative Science Lab.

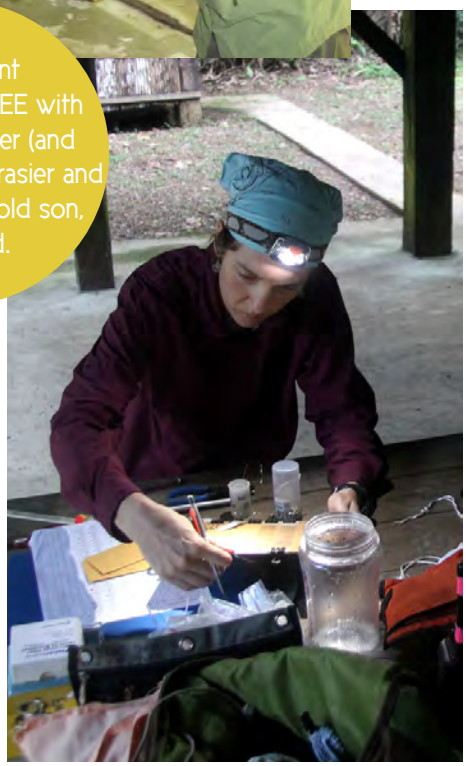
TRACKING
Migratory Songbirds

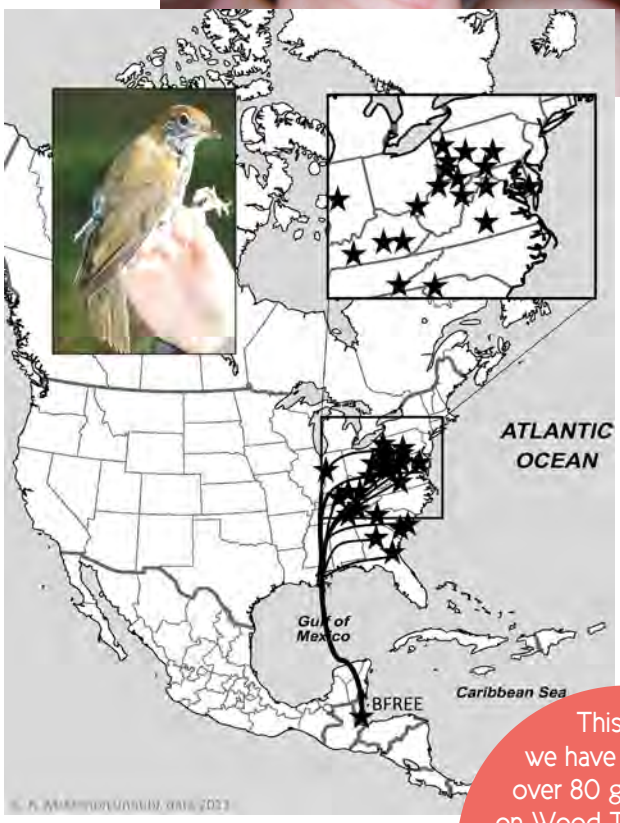
BY EMILY McKINNON
PhD candidate, York University, Toronto, Canada

BFREE is home to over 300 bird species; many of these make their summer homes in the USA and Canada. These migratory birds journey thousands of miles, twice annually, between their summer homes in the north (where they build nests and raise young) and their winter homes at BFREE in the jungle. Amazingly, many of these birds weigh only a few grams – the weight of a dime! Yet they undertake amazing migrations every spring and fall. Scientists have been studying migratory songbirds at their breeding sites and at their wintering sites, but up until very recently we have been unable to directly track the migrations of small birds. We could see them at major stopover sites along their migrations, but we had no idea where each individual was going or where they were coming from. This all changed with the miniaturization of a device called a geolocator. This tiny unit, weighing less than 1g, passively records the locations of small birds each day, allowing scientists to document, for the first time, the migratory behavior of songbirds.

At BFREE, we are studying the ecology and migrations of one of these amazing migratory songbirds, the Wood Thrush (*Hylochicla mustelina*). We are catching Wood Thrushes in the jungle around BFREE and giving them small backpacks – geolocators – that will record their migration north and back again. The backpacks are very small, and do not affect the birds' survival. The downside of these small backpacks is that they do not transmit information. We have to recapture the birds in the following year when they return to BFREE in order to download the migration and breeding site information from the geolocator. However, this is not as impossible as it sounds! Wood Thrushes, like many migratory songbirds, are site-faithful in winter, which means they return to the same patch of jungle each winter.

Emily spent her time at BFREE with fellow researcher (and husband) Kevin Frasier and their one-year-old son, Desmond.





This year we have deployed over 80 geolocators on Wood Thrushes and it is our hope that many of these birds will help provide information critical to the conservation of their species.

So far we have retrieved 28 geolocator backpacks from Wood Thrushes at BFREE! This gives us amazing insight into their migrations and breeding sites.

For example, we have found out so far that the BFREE Wood Thrushes head to the USA in the summer – breeding in Pennsylvania, Kentucky, Tennessee, Georgia, South Carolina, Indiana, Virginia, and Maryland. These birds can probably be found in mature deciduous forests in these states in the summertime. We have also documented that all the BFREE Wood Thrushes fly directly across the Gulf of Mexico during their spring migration. This is a direct flight of around 600 miles that the birds accomplish in one day!

This is the first time migratory birds have been directly tracked between Belize and their North American breeding grounds. Why is this important? According to Breeding Bird Surveys in the US and Canada, populations of migratory birds are declining at an alarming rate. Wood Thrushes in particular have recently been added to the endangered species list in Canada. Their populations have declined by 60% in the last 40 years, across North America. Why are Wood Thrushes, and many other migratory species, disappearing? Scientists trying to figure out the answer to this question struggled because once birds left their breeding or wintering sites, they didn't know exactly where they went. What areas are important migratory routes for specific breeding populations? Is there a structure linking specific breeding and wintering areas? More specifically, how flexible are migratory birds in their migration timing? Are they getting out-of-sync with their insect food in the north as climate change drives warmer spring in North America? These are all questions that we can now answer with information from tracking Wood Thrushes with geolocators. This year we have deployed over 80 geolocators on Wood Thrushes and it is our hope that many of these birds will come back to BFREE next winter and help provide information critical to the conservation of their species.

These migratory birds journey thousands of miles, twice annually, between their summer homes in the north and their winter homes at BFREE in the jungle.

BFREE is Proud to Have These Partners in Research

For a full list of individual researchers, visit our website at www.bfreebz.org

Biodiversity Research Institute
Copperhead Environmental Consulting, LLC
Environmental Research Institute
at the University of Belize
Lincoln Memorial University
Smithsonian Migratory Bird Center
Turtle Survival Alliance
University of California, Davis
University of North Carolina, Wilmington
US Fish & Wildlife Service – Northeast Region
York University, Canada
Ya'axche Conservation Trust

Growing Chocolate for the BIRDS

Elmer Tzalam (far right) describes how to look for disease in cacao saplings during a farmer training program.

Cacao tree at BFREE

BY MEGAN RACEY AND MOLLY SPERDUTO
US Fish and Wildlife Services

BFREE's work in Belize helps restore forests for migratory songbirds overwintering from the U.S.! The U.S. Fish and Wildlife Service (USFWS), along with co-Trustees from the State of Massachusetts and the National Oceanic and Atmospheric Administration, recently provided funds to BFREE to begin a program to convert up to 150 acres of farmland to shade-grown cacao.

The funding for this effort comes from a $3.7 million restoration settlement with companies responsible for contaminating the land and water around an Ashland, Massachusetts, industrial site. The settlement was reached in 1998 for natural resources harmed by mercury and other contaminants at the Nyanza Chemical Superfund site. To help restore birds harmed by the contamination the Trustees turned to BFREE.

According to USFWS project manager Molly Sperduto, "This is a new restoration approach for us. We are excited to work with BFREE to help restore and conserve wintering habitat so that the birds that nest here in New England will survive the winter months and return to breed in subsequent years. Protection of both nesting and wintering habitat is the key to helping these migratory birds."

BFREE is working with interested farmers in southern Belize to convert lands from intensive agricultural to sustainable agroforestry for cacao. Cacao, unlike pineapple and banana, can be grown under a mixed forest that provides feeding and resting habitat for neotropical migratory songbirds and nesting habitat for resident songbirds. Farmers will be trained and receive funds to convert traditional farmland and develop shade-grown agriculture, providing significant cost-effective benefits to birds and remaining economically sustainable for the local community!

Species likely to benefit include a number of songbirds: red-eyed vireo, yellow warbler, chestnut-sided warbler, yellow-rumped warbler, magnolia warbler, black-and-white warbler, northern waterthrush, gray catbird, least flycatcher, eastern kingbird, and wood thrush. Many of these were also impacted by contamination resulting from the Nyanza site.

In addition to working with BFREE, the Trustees are also using settlement funds to protect breeding habitat in Massachusetts. Farmers will be trained to convert traditional farmland to shade-grown, organic agriculture, providing a significant, cost-effective mechanism for habitat restoration beneficial to birds. Participating farmers will receive payments for this environmental service until the cacao farms are productive.

The beaksedges (Rhynchospora) comprise the largest genus of flowering plants in Belize.

Rhynchospora MARLINiana

a tribute to the Marlin family

BY ROBERT NACZI, PhD
Curator at the New York Botanical Garden

The Marlins have a new plant species named in their honor! In the current issue of Kew Bulletin, co-authors (Wesley Knapp and Wayt Thomas) and I pay tribute to the Marlins and their accomplishments by naming Rhynchospora marliniana. We felt it especially appropriate to honor the Marlins and their contributions by naming a species that is widespread and common in Belize.

We are pleased to name Rhynchospora marliniana in honor of Jacob, Kelly, Sofia, Shaman, and Hyla Marlin. The Marlins are leading advocates for the conservation of biological diversity in Belize. Their founding of the Belize Foundation for Research and Environmental Education (BFREE), and their development of what is now an active and important biological field station are especially notable among their many achievements.

Adding prestige to the Marlins' recognition is the place of publication of Rhynchospora marliniana. Kew Bulletin is the flagship scientific journal of the Royal Botanic Gardens, Kew, England, and one of the leading international journals of systematic botany in the world.

The beaksedges (Rhynchospora) comprise the largest genus of flowering plants in Belize. At least 46 species of these grass-like plants inhabit the country. Beaksedges occur in a variety of habitats, but are most diverse in savannas. Up to 16 species co-occur within a single savanna, and different savannas have different sets of species. As well, beaksedges often dominate these savannas. Floristically and ecologically, Rhynchospora is a very important genus.

On my first trip to Belize, Jacob Marlin introduced me to Belizean savannas. He showed me the savanna in the Deep River Forest Reserve, a short distance south of the BFREE border. There, I would make my first collection of what was to become Rhynchospora marliniana. However, I didn't realize its status as a new species at that time. That recognition happened a couple months later, on a trip to the Mountain Pine Ridge in western Belize.

Floristically and ecologically, Rhynchospora is a very important genus.

There, in a savanna remnant, I found growing side-by-side Rhynchospora marliniana and R. plumosa, the species with which it had been confused. Quickly, I realized that two beaksedges were present. Their co-occurrence while maintaining their distinctions was compelling evidence of the existence of two species instead of one, one of them being new to science.

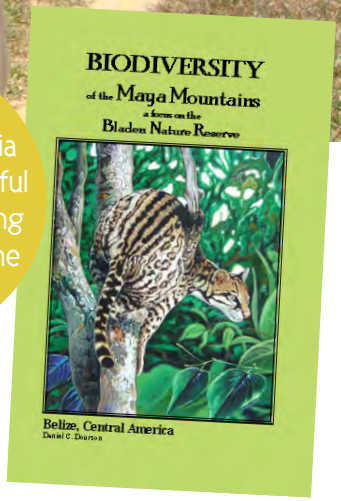
In the time since my discovery on Mountain Pine Ridge, my co-authors and I conducted the thorough research on Marlins' Beaksedge to document its status as a new species, its geographic distribution, and its ecology. During the course of additional trips, I found several more populations of it. On every one of these trips, Jacob, Kelly, and their children helped me with my research on Marlins' Beaksedge, unknowingly. I say "unknowingly," because I kept the naming a surprise until after publication.

Now, the Marlins have a species that bears their name. Marlins' Beaksedge fittingly pays tribute to BFREE and many other accomplishments in Belizean conservation. More importantly, it serves as a reminder of the power of the few individuals who made these accomplishments possible through their vision, dedication, and perseverance.

The author held his first book-signing event for the public at the 7th Natural Resource Management Symposium held at the University of Belize.

THE BOOK

Biodiversity of the Maya Mountains: A Focus on the Bladen Nature Reserve



Ernest Garcia of Placencia created the beautiful and life-like painting of an ocelot on the book's cover.

BY HEATHER BARRETT
Dir. of Organizational Development, BFREE

Biodiversity of the Maya Mountains: A Focus on the Bladen Nature Reserve, written by BFREE Biologist Daniel C. Dourson, is a look into the remarkable biodiversity of a tropical rainforest. This book, published in December 2012, is the result of seven years of explorations into the rainforest and includes significant contributions from many of the most dedicated and productive scientists who have worked in the Bladen.

According to Sharon Matola, Founder and Director of the Belize Zoo, "This is the best natural history book about Belize to date!"

> It's my experience, if you learn the names of plants and animals, they become your friends and, suddenly, there is a sense of ownership and responsibility.

This photo-rich resource serves as a window into the tremendous array of creatures, plants and natural environments that are found in this pristine yet fragile place. Everything from jaguars and harpy eagles to princess cone snails and beef worms can be found within the book's colorful pages.

Biodiversity of the Maya Mountains helps BFREE achieve its mission by highlighting the areas that the non-profit has been working to protect for nearly 20 years. The goal of the project has been to create an educational tool and a high quality scientific resource for current and future stake-holders and decision-makers in the country. When asked his motivation for writing the book, Dan stated, "While living in Belize, I was shocked by all of the kids I met who didn't know the wildlife in their own backyard. It's my experience, if you learn the names of plants and animals, they become your friends and, suddenly, there is a sense of ownership and responsibility." For this reason, in 2012 BFREE raised funds for the initial publication of 500 copies; 250 were donated to teachers, school libraries and students in Belize and the remaining 250 are being sold in order to fund a second printing to allow for greater access to the information.

Recipients have included schools in communities that buffer BFREE and the Bladen Nature Reserve: Bladen Village, Trio Village, Golden Stream, Bella Vista, San Isidro, and Indian Creek; the University of Belize, Independence Junior College; conservation organizations such as Ya'axche Conservation Trust, Belize Audubon Society and Friends of Conservation and Development; and government agencies such as the Forest Department, Ministry of Education, Ministry of Forestry, Fisheries and Sustainable Development and Belize Tourism Industry Association.

The book was a collaborative effort between the author and BFREE. Jacob Marlin, Executive Director of BFREE, and enthusiastic participant in the project, said, "Year after year foreign scientists come to this country to study the magnificent biodiversity and usually leave nothing behind. Dan Dourson's book may be one of the most precious gifts a foreign scientist has given to Belize."

Training to be an Avian Tech


Marlyn Cruz and William Garcia

BY CHELSEA HETELSON
Program Assistant, BFREE

The Avian Tech Training Program was initiated by Drs. Jamie Rotenberg and Jeff Hill of the University of North Carolina at Wilmington (UNCW), Department of Environmental Studies; Santos Chicas, faculty from the Natural Resources Management Program at the University of Belize (UB); and Jacob Marlin of BFREE. Funds were provided through the Cahill grants Belize International Research Competition program at UNCW. Dr. Hill, who organized the curriculum with Dr. Rotenberg, says the majority of the program focused on teaching UB students avian field methods and research skills to ready them for a career in a Belize conservation-based program; with an emphasis on teaching conservation.


Abidas Ash

"There are many people who are really good scientists and producing lots of scientific data, but they're not relaying that to the public in a way that makes sense to locals," says Dr. Hill. "So science is happening, but it's not trickling down to the public and improving science literacy and conservation."

There were three participants in this first round of the program which began in April 2012: Abidas Ash and Allan Romero are UB students and Marlyn Cruz is from Bella Vista Village, located close to BFREE. "One of the central missions of BFREE and our work with the avian bird team is to build capacity by hiring and training local people," says Dr. Rotenberg. William Garcia, avian program coordinator, from Trio Village, recruited Marlyn who has joined BFREE's staff as the first female avian technician.

Abidas Ash said when she heard about the program, it piqued her interest because in 2010 she took a bird watching course that she really enjoyed. Pursuing a bachelor's degree in Natural Resource Management, she says she can now apply what she learned in the training program to her different courses in the Natural Resource Management field.

As for the outreach component of the program, she believes this is "essential in doing research, to let the communities know what is happening and to make them aware."

Allan Romero was studying marine ecosystems at UB when he heard about the avian training program. Impressed by the program and opportunity, he decided to apply. "I wanted to contribute a little more to the environment and since I had only worked in the marine side of things this seemed like a really good opportunity to work towards that goal."

Since the program ended he is now involved with the Ya'axche Conservation Trust helping to manage bird clubs in the communities that buffer the Bladen Nature Reserve.


Allan Romero

Dr. Rotenberg is enthusiastic about the outcome of the program. "The students performed really well and had a high level of commitment," says Rotenberg. "They traveled to BFREE each month, learned hands-on skills, and then were tested by William to insure that they were progressing. We now have an array of data from the students that we will analyze to measure the program's effectiveness," says Rotenberg. "We can then continue to make improvements to the curriculum for future trainees."

In the end Dr. Hill says the hope is that Abidas, Allan, Marlyn and future participants in the training program not only become skilled avian technicians, but also become evangelists for maintaining biodiversity by getting out and talking to the public, especially to kids, about the importance of conservation.

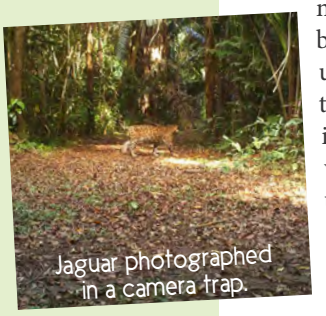
A NIGHT HIKE AT BFREE


Rachael Bruce (front right) with fellow UF Law Course students.

On one of my last evenings at BFREE, William agreed to take us on a night hike deeper into the property. A few nights earlier I went on a similar hike, but the surplus of headlamps and the inability of some group members to be silent prevented us from seeing much other than millions of leaf cutter ants marching in lines to their homes. On this second attempt, we followed William eagerly into the darkness, trying not to crunch the dried leaves beneath our feet. We walked in a line: William, two female students behind him, myself, two male students behind me and then one of our professors in the rear. Trying to blend in and catch wildlife off-guard is no easy feat, especially with that many people, but this group of explorers was amazing. William and I were the only ones using our headlamps and every time he would stop and switch his lamp off to listen and observe, we would all come to a halt and I would quickly bring my lamp against my thigh to extinguish all light around us.

We would stand absolutely still for a few minutes listening to the sounds of the jungle in the pitch-black darkness. Then William would turn the light back on and either continue forward or slightly veer off our previous path following his senses. At some point on the hike William froze, put his hand up for us to stop and whispered without moving his headlamp, "Jaguar!" Of course we did exactly the wrong thing and all leapt forward at once for a chance to see the majestic and beloved icon of Belize. This only scared him deeper into the brush and trees.

Now we were on the hunt and with William's help we started following the jaguar's path, trying to catch another peek. William's ability to read the forest is astounding and not too long after we thought we had lost our target, William identified some bent plants on either side of our path and motioned for us to turn off the lights and all fell still. As I listened intently to the sounds around me, there was no doubt that there was more going on than my senses could process. I was holding my breath and I don't think I was the only one. Then we heard it - a large animal, walking cautiously, less than 10 to 15 feet from us. Our jaguar was here, but how close? What was he thinking? Did he know we were here? Was this the same jaguar we had seen in images taken by camera traps around the property? After several minutes, William turned his light back on and said, "He is gone."


Jaguar photographed in a camera trap.

We continued our hike back towards the main compound and saw several Kinkajou high in the treetops, their golden eyes staring down into our lights. We decided it was better that only William saw the jaguar. Instead, we got to hear the jungle cat in its own territory and feel the heartbeat of the forest at night.

- Rachael Bruce, University of Florida Levin College of Law J.D.

UF Reflects on a BFREE Field Course

I thoroughly enjoyed the opportunity to work with BFREE to develop and implement a policy-based field course in Belize. In our program, we have found there is no substitute in the classroom for exposure to the sorts of issues that confront sustainable development policy practitioners in the field. In addition to its educational value, the remote and rustic qualities of the field station presented life challenges that some of my law students will remember forever – and increasingly fondly – as time diminishes the "hardships" they endured "bunking out" at BFREE. One of those hardships was not the food! The stories told by BFREE's guest lecturers from the Maya Community were riveting and laden with meaning as we studied the cases that directly affected them.

- Tom Ankersen, Director, Conservation Clinic at the Center for Governmental Responsibility, University of Florida


UF Law Course student group led by Tom Ankerson.


Gentry Mander participated as a student as well as assisted Tom with the pre-departure logistics for the course.

As an accountant, and soon to be lawyer, I can honestly say that I never thought I would visit and study at an environmental research field station. Over the past year, the study of sustainable development and the associated law, policy and practice became a large portion of my academic schedule. However, discussing general concepts and theories from a classroom in the United States is quite a different experience than spending a week seeing the theories applied at BFREE. Educational discussions would begin with a simple story and quickly transition into a teaching session where we learned the local practices. I found this to be particularly helpful because I feel that in order to draft appropriate policy it is imperative that we understand the direct impact that regulations will have on current local practices. Additionally, while studying at BFREE we saw a legal issue arise at the field station itself. After a day of studying property and land use rights, we witnessed a researcher return from a hike where he found BFREE's property was being encroached upon illegally.


Saira Fida

All in all, the time at the research station truly allowed us to weave reality into the conceptual framework built back in the states. The invaluable educational experience was also intermixed with learning the local Belizean culture. As a group we appreciated that we were always greeted with big smiles and warmly welcomed throughout our travels. It's a truly unique experience to study in an environment where we were surrounded by individuals who are like-minded, hard-working and trying to accomplish such an incredible goal.

- Saira Fida, Law Student, University of Florida

Field Courses Held at BFREE

2012

Otterbein University
Tropical Ecology, Conservation, and Public Perceptions

Vermont Commons
Tropical Rainforests

Independence Junior College, Belize
Field Survey Methods

Lees-McRae College
Wildlife Biology

St. Mary's College
Tropical Biology-Belize Study Tour

University of the Cumberlands, Kentucky
Tropical Ecology

Western Michigan University
Tropical Biology

Lakeland College
Tropical Biology

University of Florida
Tourism Planning

Winona State University, Minnesota
Tropical Ecology

Sewanee: University of the South
Field Study in Belize

Wildlands
Ecosystems and Cultures

2013

Nebraska Wesleyan University
Tropical Biology of Belize

Otterbein University, Ohio
Tropical Ecology, Conservation and Public Perceptions

Sterling College, Vermont
Research in Tropical Ecosystems in Belize

Independence Junior College, Belize
Field Survey Methods

University of North Carolina at Wilmington
Field Experiences in Belize

University of Florida
Sustainable Development: Law, Policy and Practice

St. Mary's College, Maryland
Tropical Biology-Belize Study Tour

Keene High School, Keene New Hampshire
Tropical Ecology

Emory and Henry College, Virginia
Belize: Environment and Sustainability

Marshall University, West Virginia
Tropical Ecology

Sewanee: University of the South Tennessee
Tropical Biology

Lakeshore Technical College, Heartland College, and Madison College
Wisconsin Renewable Energy Project

Wildlands
Ecosystems and Cultures

The International Avian Tech Team

BY HEATHER BARRETT
Dir. of Organizational Development, BFREE

BFREE works hard to link Belizeans to development opportunities, both in Belize and abroad. By offering educational programs in village schools and to community members and by training and employing locals to become parabiologists and educators, BFREE seeks to involve Belizean stakeholders in the pursuit of the organizational mission "to conserve the biodiversity and cultural heritage of Belize."

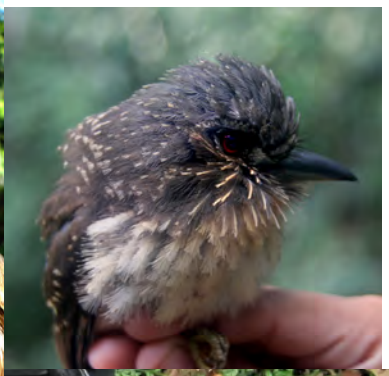
Fifteen individuals have completed avian technician training with BFREE; three of whom are currently employed by the non-profit. We are proud to announce that two of the three are pursuing training opportunities abroad this summer.

Liberato "Gato" Pop, avian technician, is in the third month of a six month bird banding internship with the Klamath Bird Observatory in Oregon, USA.

Marlyn Cruz, newest avian team member, began her first international internship with Copperhead Environmental Consulting, Inc. in Kentucky, USA this June.

By helping to provide opportunities to these up and coming environmental leaders from communities near BFREE, we are striving to develop the next generation of environmental advocates who will serve as role models for their fellow Belizeans.


Marlyn Cruz



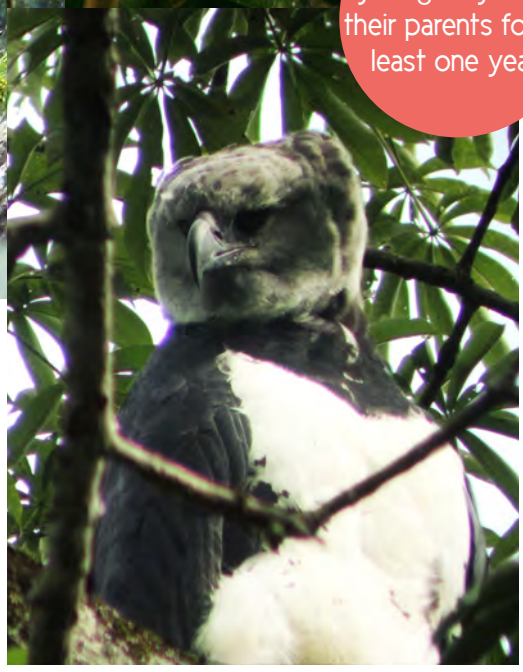

Gato Pop

HARPY NEST DISCOVERY

"These nests may be the most significant biological discoveries for Belize in recent years"
– Jacob Marlin

Harpy Eagles lay 1–2 eggs every 3 years.

Harpy young stay with their parents for at least one year.



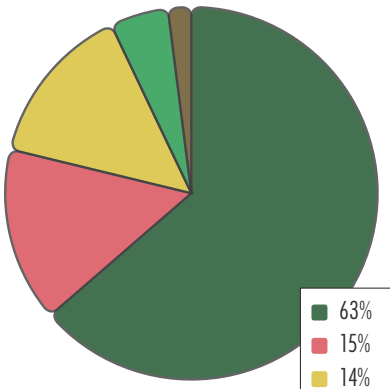
BY HEATHER BARRETT
Dir. of Organizational Development, BFREE
& DR. JAMIE ROTENBERG
University of North Carolina at Wilmington

In late 2012 and early 2013, two new Harpy Eagle nests were discovered in the Maya Mountains of southern Belize. The nests, approximately 15 km from one another – one in the Columbia River Forest Reserve and the other in the Bladen Nature Reserve – are continued proof that there is an active, breeding population of wild Harpy Eagles in Belize. BFREE's Avian Team, along with some community members, monitored the Columbia River Forest Reserve nest from a safe distance to avoid disturbance. An adult female was observed on the nest although no chick was verified. In January 2013, the team discovered the Bladen nest and monitored activity from a lookout approximately 300 meters away on four separate trips during the spring. They were able to prove with photographs and video that the nest was home to a healthy male juvenile and his parents. As of May 2013, the chick had fledged the nest and the team wrapped up their monitoring efforts in anticipation of rainy season.

These nest discoveries in Belize, along with another Harpy Eagle nest discovery in Honduras this year, provide evidence that top predators can still survive in the few wild, protected places. Even though this is the northernmost part of the Harpy Eagle's range, the birds remain. Protected areas, like the Bladen, are vital for Harpy habitat because they are fully functioning intact ecosystems. BFREE is glad to have played a small part in Harpy Eagle conservation once again.

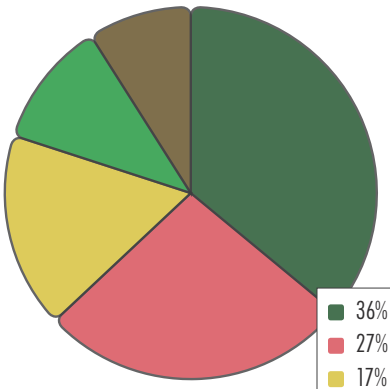
This project was funded in part by the Columbus Zoo and Aquarium Conservation Fund.

Financial Report 2012 – Current



Income

63%	Education Program Fees
15%	Contributions & Memberbships
14%	Grants
5%	Research Program Fees
2%	Other



Expenses

36%	Education Programs
27%	Field Station Operations
17%	Research Programs
11%	Infrastructure
9%	Administration

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Mountain Corporation
Richard Creighton and Jane Ottenberg
Turtle Survival Alliance
University of North Carolina at Wilmington
Vibeke Olson and James Rotenberg

$10,000 +
HICATEE TURTLE

Columbus Zoo and Aquarium Conservation Fund
David and Jackie Marlin
US Department of the Interior, Fish and Wildlife Service, *on behalf of the Nyanza Natural Resource Damage Trustee Council - comprised of the Service, Commonwealth of Massachusetts and National Oceanic and Atmospheric Administration*

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www.bfreebz.org
info@bfreebz.org
US: 352-727-4550 | Belize: 011-501-671-1299

Every year BFREE conducts environmental education programs to schools in the communities adjacent to the reserve. During 2012 and 2013, over 750 students, teachers and family members were served by BFREE's outreach initiatives. Recent programs have focused on Harpy Eagle conservation in partnership with the Belize Zoo and have been offered to the communities of Bladen, Bella Vista, Golden Stream, Indian Creek, Medina Bank, San Isidro, and Trio.

Students in the village of Golden Stream wear their new Harpy Eagle T-shirts proudly. Designed by BFREE staff member, Chelsea Hetelson, these T-shirts were printed and donated by Michael Krinksy and the Mountain Corporation.

T-shirts read:
(front) Harpy Eagles (back) Our Maya Mountain Neighbors