

BELIZE FOUNDATION FOR RESEARCH & ENVIRONMENTAL EDUCATION

THE BLADEN REVIEW



2024 | VOL. 9

A Letter from the Executive Director

Greetings to all BFREE friends and family.

It gives me great pleasure to share this year's edition of the Bladen Review filled with some of the highlights of 2024.

Our location, bordering four other protected areas and lying at the gateway to the majestic Maya Mountains, has been, and is still so critical to the preservation of this incredible tropical landscape. The threats, however, to BFREE and surrounding reserves, continue. 2024 was no exception.

This year we experienced a severe prolonged drought with extreme heat, much like other places around the world. The human-caused climate crisis, which we all face as global citizens, was on our front doorstep. It was one of the hottest and driest years on record. The heat, frequently 100 degrees or more in the shade, with much hotter temperatures in the direct sun, baked down on the forests for almost four months creating difficult conditions for our staff and visitors, and producing the perfect circumstances for fire. And indeed, fires spread throughout the country including major fires in the south and nearby the BFREE reserve. Luckily, BFREE escaped any major incursions due to the steadfast hard work of our ranger team. However, the fires in the south heavily impacted the indigenous Maya communities with over 400 farming families losing their farmland to catastrophic fires, with thousands of acres burned.

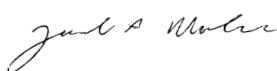
The climate crisis is real. It's well documented and affects communities worldwide. In late September, Hurricane Helene caused catastrophic damage to the southeast U.S.A., including Asheville and Hendersonville, N.C. where three of BFREE's primary administrators reside part of the year. Whether it be drought, fire, flooding, or hurricanes, clearly no place on earth is not affected. Despite these and other challenges, we continue to stay positive. Human beings have the responsibility and duty to care for and preserve this home we call planet earth. We also have the technology and knowhow to reverse the trends causing the climate crisis. Let's all play a role and ensure that people in positions of power and influence have the vision and fortitude to lead. For our part, we will work even harder to protect our little piece of paradise and expand our influence to advocate for the protection of watersheds, and the sustainable management of the forests and reserves in our backyard. Belize still is an incredible sanctuary for wildlife and wildlands. Our mission, "to conserve the biodiversity and cultural heritage of Belize", remains as strong as ever and has never been more vital to life on earth.

2024 was also a year of growth and the advancement of many of our core programs, as you will learn about in the pages that follow. Thanks to the generous support from those of you who donated last year, we hired two new key staff positions. These include US Office Administrator, Bridget Nelson, based in Asheville, North Carolina and Conservation and Science Director, Rob Klinger, Ph.D., based mostly at BFREE.

BFREE continues to serve not only as a refuge for wildlife, but also a refuge for people. We recognize that our role in protecting the incredible biodiversity at BFREE not only benefits the flora and fauna, but is also important to the wellbeing of those who come here and experience the pristine Bladen River, the countless species of wildlife, the incredible forests, and our amazing staff and programs.

As always, we continue to provide exceptional educational programming, host researchers, and offer access to one of the most biologically rich rainforests left on earth. We will continue to inspire the next generation, discover the mysteries of the natural world, and ensure that the wilderness in Belize remains conserved for generations. This is all possible because of your patronage. We hope you'll continue to contribute to these efforts; we could not do this important work without you.

In conservation and stewardship,



Jacob A. Marlin



Jacob with a common green Iguana

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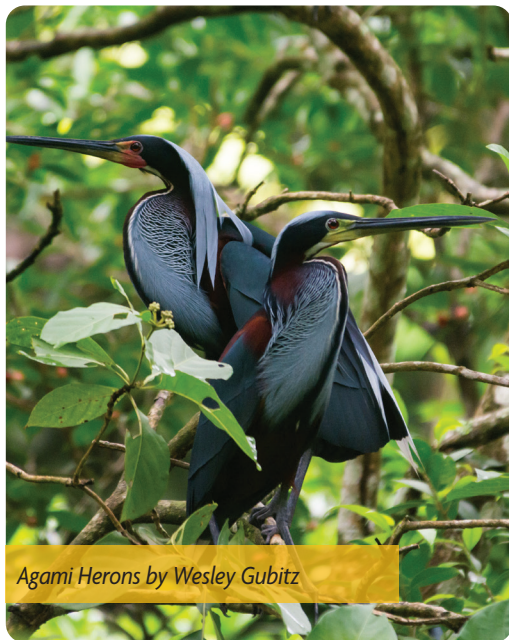
Back Cover Photo

Parr McQueen

Photos by BFREE staff unless credited otherwise

Creating a plan for bird monitoring at BFREE by Steve Albert, Institute for Bird Populations

The BFREE Reserve covers 1,153 acres in the Toledo District of southern Belize, adjoining the largest tract of intact rainforest north of the Amazon. More than 300 species of migratory and resident birds use the area during all or part of the year, including such rare or imperiled species as Harpy Eagle, Agami and Boat-billed Heron, and Scarlet Macaw. **In the past year, the Institute for Bird Populations and BFREE have worked together to create a monitoring plan to cover these and other species**, so that changes in bird populations can be tracked, and BFREE staff can develop informed conservation strategies.



Agami Herons by Wesley Gubitz

Monitoring is not a one size fits all undertaking. Different methods are for different species, based on their size, rarity, life history, the objectives of population monitoring, and the available staff and funding. Together, we developed a set of strategies to cover all the main taxa of concern, including:

- A set of point count routes to monitor landbirds
- A modified set of point counts to monitor birds at BFREE's award-winning organic cacao farm
- Nesting and brood counts at a sensitive marsh where Agami and Boat-billed Herons nest
- A standardized reporting system for observations of rare species such as Harpy Eagle, Scarlet Macaw, Great Tinamou, Yellow-headed Parrot, and others

The methods were tested by Mario Teul during the second quarter of the year with support from Dr. Robert Klinger on the launch of the associated bird database. **Monitoring officially began in August 2024 and will continue for the foreseeable future.**

Inventory and Monitoring of the Turtles at BFREE by Eric Munscher of SWCA Environmental Consultants

This July, we completed the fourth year in a planned ten-year survey of freshwater turtle species on the BFREE reserve. This study was the brainchild of many people in the Turtle Survival Alliance in 2019 but was delayed by the Covid pandemic. This project was designed to fill in knowledge gaps for as many Belizean turtle species as possible. Long-term population demographics including population estimates, survivability over time, sex ratios, density, biomass, and growth are largely unknown for these species. We officially launched the project in 2021 and the data we have gathered in these four years is incredible. **We have eight of the nine native species of inland turtles of Belize at this amazing study site.** Two of which were not expected to range within this region of Belize, one of which (the Narrow-bridged musk turtle) represents a large range extension for this species. Our data helps support the value of protected areas like BFREE and the Deep River Forest Reserve as sanctuaries where turtles and other wildlife can thrive. During the 2024 survey, we safely captured and took data on 302 turtles. **This impressive data collection resulted in the study surpassing the milestone of 1000 individually marked animals.** The data from this study has already produced two published peer reviewed manuscripts and several species notes and we are preparing three additional important publications over the next year or two.

Species list:

- White-lipped mud turtle (*Kinosternon leucostomum*)
- Tabasco mud turtle (*Kinosternon acutum*)
- Mesoamerican slider (*Trachemys venusta*)
- Red-cheeked mud turtle (*Kinosternon scorpioides*)
- Mexican giant musk turtle (*Staurotypus triporcatus*)
- Furrowed wood turtle (*Rhinoclemmys aerolata*)
- Narrow-bridged musk turtle (*Claudius angustatus*)
- Central American snapping turtle (*Chelydra rossignonii*)



Narrow-bridged Musk Turtle

The Wild Heirloom Cacao and Chocolate Program at BFREE

The cacao agroforestry program at BFREE is multifaceted, and this year's activities were no exception. In addition to continuously improving the farm and striving to produce the highest quality heirloom cacao beans, many other activities occurred both on-site and internationally.



Jacob Marlin, BFREE Executive Director, teaching the cacao staff, Milton Cohuoj (front left) and Michael Pop (back center), the best methods for structural pruning of young cacao trees. At BFREE, the Heirloom cacao trees are grafted and require specific and delicate pruning practices to maximize production and reduce threats of disease.



Roxanna Chen, the first female graduate of the BFREE Science and Education fellowship program, is shown leading a class on sensory analysis of chocolate for BFREE staff. Roxanna conducted a year-long study on fermentation of the wild criollo cacao beans harvested from the farm in 2023 and 2024. She also experimented with making chocolate, conducting dozens of experiments using different roasting profiles to determine the most delicious chocolate based on flavor and aroma characteristics.

Lenardo Ash and Professor Bonnie Ownley Ph.D. at University of Tennessee at Knoxville. Lenardo is a Cacao Fellow Alum who is currently pursuing his master's degree at UTK in the Department of Entomology and Plant Pathology. One of his focal areas is identifying the pathogens, specifically fungal communities, that are present in the heirloom cacao farm at BFREE. His work hopes to help improve best management practices on the farm.

2023 - 2024 BFREE Field Courses

- ARCC Travel Programs for High School
- Bethel University
- Emory and Henry University
- Independence Junior College of Belize
- Kutztown University
- Lakeland University
- Lindsey Wilson College
- Sacred Heart Junior College of Belize
- Saint Mary's University
- The Pennsylvania State University
- University of Tennessee, Knoxville
- University of Victoria
- West Virginia University
- Western Michigan University



Mario Teul began leading BFREE Field Courses in 2023. His experience with bird monitoring and bird banding along with his many years working as a tour guide and educator throughout Belize has enriched BFREE's programming.

Interested in learning more about BFREE Field Courses, whether you are a student, supporter, or both? Please visit bfreebz.org for further information.

Ten Years of the Hicatee Conservation and Research Center

This year marks the tenth anniversary of the Hicatee Conservation and Research Center (HCRC) at BFREE. With an adult breeding population of 45 turtles, a devoted leadership team and staff, and continued and growing partnerships with Belize Fisheries Department, Turtle Survival Alliance, Zoo New England and Belize Wildlife and Referral Clinic, the project is constantly evolving.



The HCRC has been featured in five documentary films and series, including a part in Episode 4 of 'Unknown Belize' streaming on Amazon Prime in the UK.

10,000+	Hicatee resources distributed during outreach activities
3,000+	Individuals toured the HCRC since inception
516	Captive-hatched turtles released into five water bodies in Belize
500+	Schools reached with messaging and materials
25+	Conference and professional presentations
15+	Local and international magazine and newspaper articles
Seven	Media interviews and features on Belize news stations
Five	Scientific notes and publications produced



The captive population at the HCRC consists of 45 breeding adults. To date, those turtles have produced 174 clutches resulting in 1,811 eggs, and 1,460 hatchling turtles.

Community Workshops Raise Hicatee Awareness

In 2024, BFREE hosted two half-day and one full-day listening workshops throughout Belize to continue conversations on the topic of **Hicatee conservation**. Two of the workshops were offered to college students while the third was offered to traditional fishers who have harvested Hicatee in the rivers of Belize for generations. **These workshops are a continued effort to elevate recognition of and identify current threats to the critically endangered Hicatee turtle.** They also provide space to brainstorm conservation actions and sustainable solutions that individuals and communities can implement.



This one-day workshop, led by Jaren Serano and Ed Boles, was co-hosted by the Community Baboon Sanctuary Women's Conservation Group.

Thirty-eight (38) engaged members from twelve villages participated.



Twenty-five (25) students majoring in the Natural Resources Management and Biology program at University of Belize actively participated in – “Empowering Student Advocates: Turning Ideas Into Conservation Action”– a BFREE workshop led by Heather Barrett and Jaren Serano.

BFREE Celebrates Recent Fellow Graduates

“While participating in the 2024 turtle survey at BFREE, I loved learning about the BFREE Fellowship Program and connecting with the fellows. **The Fellowship Program offers a two-year immersive workforce training program to recent Belizean junior college and college graduates.** Heather Barrett, Deputy Director of BFREE, with the help of Jacob Marlin and Jaren Serano, created this program to empower future conservation leaders and allow young professionals to get their foot in the door in wildlife conservation and agroforestry. **It is an example of a successful program that is essential to the future of conservation through community involvement and cultivating aspiring leaders.**”



During my visit, I met Barney Hall and Roxanna Chen, two of the most recent graduates of the fellowship program. Roxanna was the first female graduate of the program and has since become a permanent staff member at BFREE. Barney has recently begun his next journey in conservation by pursuing a Bachelor's in Environmental Science at the University of Augsburg in Minnesota.”

-Rachael Harff, Turtle Survival Alliance

The Fellowship program has had nine participants to date. From left to right - Jaren Serano, Samih Young, Jonathan Dubon, Roxanna Chen, Heston Castillo, Heather Barrett (Program Director), Mark Canti, Barney Hall and Andrew Choco. Not pictured Lenardo Ash.

Introducing the Newest BFREE Fellows

For the first time ever, BFREE hosted a Summer Fellow Program. From Herpetology 101, to Hicatee Awareness Month planning, to assisting in the long-term turtle survey on the property and assisting with the cacao agroforestry program, this two-month program was a crash-course in everything BFREE. After the summer, the Fellows continued on to their respective roles at BFREE and as students. We are excited to introduce them to you.

Samih Young



“My name is Samih Young, and I am currently pursuing a Bachelor's degree in Natural Resource Management. I also serve as the Wildlife Education Fellow at BFREE. Through this role, I am deeply committed to promoting environmental awareness and fostering a deeper understanding of Belize's rich biodiversity.”

Heston Castillo



“I am the current Cacao Fellow here at the BFREE headquarters. My role involves assisting in various capacities, whether it's working in the field or the laboratory. I've been stationed at BFREE for several months now, and I've really resonated with the area, especially as a nature lover. This experience has not only deepened my connection to the natural world but has also allowed me to learn more about myself.”

Andrew Choco



“Ever since I was a kid, my love for nature has shaped much of my journey, eventually leading me to BFREE, where I had the chance to work with the endangered Hicatee turtle. Initially, I didn't realize how much I cared for reptiles, but after interning, I became fascinated with these creatures—whether they're lizards, crocodiles, snakes, or turtles. That experience ignited my passion for reptile conservation. Being offered the role of Wildlife Fellow has allowed me to dive deeper into this field, where I get to protect and study these incredible animals every day.”

DONORS

We are so grateful to each of you for your generous financial contributions, in-kind donations, and words of encouragement. Thank you for believing in BFREE's staff and mission. Your generosity has enabled us to maintain operations at BFREE, allowing us to continue the crucial work of conserving the wildlands and wildlife of Belize. Our sincere thanks to the BFREE donors from October 2022 to August 2024.

This list is alphabetized by first name. Please let us know of any errors or omissions on this list.

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Puma by Parr McQueen

A Safe Haven for Big Cats

Mountain lions are known by many names, including puma, panther, cougar, catamount, and red tiger. They are the most-wide ranging of any cat species in the world, being found as far north as Canada and as far south as Chile. They inhabit a wide range of habitats including forests, deserts, savannas, swamps, and even human settled areas. This iconic species is emblematic of power, strength, stealth, and grace, and serves as an important reminder to conserve corridors of undeveloped and protected lands throughout the Americas to allow for the free movement of individuals throughout their extensive range. The BFREE privately protected area serves a vital role in providing protected habitat, ensuring this charismatic species has a safe haven to live, and connects open grass savannas along the coastal plain of southern Belize to the dense jungles of the Maya Mountains.



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