International Wildlife
January/February 2001

Heaven For Scientists

By Steve Hendrix
Photographs by Lynda Richardson

Eager researchers who troop to Barro Colorado Island in the Panama Canal find the insects are rampant but the sheets are clean

KATIE MILTON steps from her room just as the predawn stillness is shattered by a ghastly moan. That scream from the treetops is answered by another, and another, until the tropical forest shakes under a thundering bellow. It sounds like a circle of Dante's hell. But it's just the way howler monkeys greet the sun on Panama's Barro Colorado Island (BCI).

"The dawn chorus," says Milton with a broad grin. Fresh from a hot shower and a good night's sleep under white sheets, she now strides a few yards into a primeval world—the rich cacophony of a thriving tropical forest. It's the kind of intact wilderness that biologists usually find only in rough outbacks, where tents and dried beans are the standard. But in this forest, after several hours of steamy fieldwork, Milton—an anthropologist from the University of California at Berkeley—will emerge from the jungle to a hot buffet in a cool dining room.

UNGAINLY INSECTS, such as this walkingstick on the hand of German scientist Juergen Berger, inhabit Barro Colorado, an island isolated from the mainland when the Panama Canal was built. The island is also home to 380 bird species, 120 mammals and droves of visiting researchers.

As Milton plunges into the jungle, a young mammalogist walks out of it, tired from a night of capturing and measuring bats at different points around the island. The newcomer drops her nets in the lab and heads toward the dining hall, a low, modern building surrounded by a handful of dorms, docks and the

sprawling main laboratory complex. Other figures walk that way too, sleepyheaded botanists, entomologists and ornithologists lured through the misty light by the smell of coffee and bacon. A group of forestry graduate students hikes out toward the 50-acre plot, a patch of woods where scientists have tracked the life, growth and death of every single tree for decades. At the docks, a motor coughs and gurgles to life. A boatman eases a launch out toward open water, while in the bow Janeene Touchton fits headphones over her ears and begins sweeping the sky with a handheld aerial.

"Got her," she murmurs, and points eastward. The motor bawls and the boat sweeps around the end of the island in hot pursuit of a pair of radio-banded harpy eagles. For the next eight hours, Touchton—a field researcher for the Idaho-based Peregrine Fund—will track the birds' every flap and preen until roosting time. Then the eagles will sleep and Touchton will race back to the compound in time for social hour.

As the launch slides forward, a low rumble rolls across the water. Suddenly, coming around the island a scant 30 yards away, a massive freighter churns into view, a towering wall of steel that eclipses the horizon and much of the sky. She's a 900-foot Hapag-Lloyd container vessel, fully laden and riding low. Her bow wave sends the little boat pitching like a bronco. Touchton never looks up from her radio.

Big ships are no big deal off Barro Colorado. The island—the first field station of the Smithsonian Tropical Research Institute—sits squarely in the middle of the world's most famous shipping lane, the Panama Canal. Although the Canal Zone was transferred from the United States to Panama at the end of 1999, Barro Colorado continues to be managed by this U.S. institution and remains an official American presence in the canal area. The island is, in fact, a child of the canal. It was formed when engineers flooded the Isthmus of Panama from ocean to ocean almost a century ago.

For decades since, world trade has steamed steadily by as scientists flocked to Barro Colorado to immerse themselves in the delights of world-class labs and three-star accommodations surrounded by 3,700 acres of unsullied jungle habitat. Each month, new boatloads of eager scientists skip across the wakes of tugs and tankers to take their turn at this biological Club Med.

"It's fieldwork paradise," says Milton. Since 1974, she's been coming here at least once a year to study howlers. "The work is no easier; it's a real jungle after all, boiling hot, terrible humidity and bugs that eat you up. But after a day of that in Brazil, you have to wash your clothes in a river and build a fire. Here you can come in, have a shower, a delicious dinner and someone to talk to."

Since 1923, this combination of real-world jungle and relative comfort has made Barro Colorado the most intensively studied tropical forest in the world, the Rosetta stone of forest investigation. Dozens of staff researchers and 200 visiting scientists a year poke and prod every acre, cataloging plants, collecting insects, measuring the day-to-day workings of nature's most sophisticated habitat.

"All of the complexities of the tropical ecosystem began to be understood on BCI," says Milton. "People here have the ability to carry out studies for one, two, three years. They can live here; they can bring their families." She leans in conspiratorially. "And oh, have there been romances!"

HANDS-ON SCIENCE is part of the job for Greg Ruthig (above) who examines Central American spiny rats. The rats are "toe clipped" for a fragmentation study. Sharing the canal with an ocean freighter, Janeene Touchton (above left) homes in on radio-banded harpy eagles.

Science's love affair with the Panamanian wilderness began not with the 1914 flood that turned a forested hilltop into Barro Colorado Island, but with the flood of entomologists that preceded it. Yellow fever and other insect-born diseases were ravaging the canal construction crews. (Monuments to the workers'; suffering still show up; researcher Greg Ruthig, tagging spiny rats on surrounding islands, recently stumbled across a field of rusty iron crosses, the grave markers of nineteenth-century French canal diggers.) The biologists brought in to battle the mosquitoes found themselves in the richest tropical habitat they had ever seen. They began whispering in the ears of U.S. government officials to set aside a piece of the Canal Zone for biological research.

The most enthusiastic of them, an entomologist named James Zetek, didn't wait for official action but set up shop informally on the canal's biggest isolated wilderness, the newly formed Barro Colorado. At first he and a few fellow diehards were joined mainly by gentleman naturalists, wealthy yachtsmen who tied up during their canal crossings to collect insects and plants on the island. But in time, more professional scientists began visiting, bunking with Zetek in the frame laboratory he built high over the lagoon and taking the first methodical looks at this teeming New World forest.

"At first they were just trying to find out what was here," says Beth King, a plant pathologist and education specialist for the institute. "In the mode of the times, that meant collect it, kill it and send it back to the museum that sponsored you."

What they found was dazzling. The small island was alive with wildlife: sloths, tapirs, peccaries, howler monkeys, tamarins, ocelots, blue-headed parrots, trogons and oropendolas, birds that make noises like water dropping on water. In all, more than 380 bird species and 120 mammals. Specimen by specimen, their scientific understanding grew along with the island's reputation as a field station. In 1923, it was declared an official biological reserve within the Canal Zone, one of the first such preserves in the Western Hemisphere.

It was a distinction, but one that carried very little funding. Zetek, by then the station manager, searched for money constantly. He urged his stateside fund-raisers to exploit the popularity of former president and canal patron Theodore Roosevelt: "We can raise millions of dollars if we milk the admirers of Teddy ...," Zetek wrote. He convinced universities to kick in "table grants" to reserve lab space for their biologists. The Kodak company funded a new building in exchange for tests on how film stock would survive in the Tropics. And in the years leading up to World War II, Zetek landed contracts to test termite-proof building materials. More and more scientists made the trip to the Canal Zone, lured by the ease of reaching such a pristine forest and the security of living in an official, English-speaking outpost of the United States. Men slept in the dorm just off the lab. Women commuted daily by boat from Panama City.

"In short, on Barro Colorado, every possible prospect pleases and we are the only men," wrote Frank

Chapman, the well-known curator of birds at the American Museum of Natural History and an early Barro Colorado resident. "There are no automobiles (the only ones I saw were on the deck of a submarine passing through the canal), no radios, no jazz, no movies, no holdups or similar evidence of decadent human nature."

Zetek, meanwhile, was tireless. He rarely enjoyed a flush budget during his three decades as head of Barro Colorado, but he kept the research going and accumulated a foundation of information that scientists are still mining today. The very concept of long-term ecological studies was refined here, based on decades' worth of life histories gathered on countless organisms and populations.

"The baseline data is enormous," says Juergen Berger, a German doctoral student studying the coevolution of walkingstick insects and the plants they eat. "It's like nowhere else. They've been collecting this data since the 1920s."

Indeed, next to the old Kodak film building, Barro Colorado boasts its own herbarium, a catalog of 1,316 plant species that any university would be proud of. "We know just about every plant on this island," says Milton. "Do you know how useful it is to come in from the field with a leaf that one of my howler monkeys was eating and be able to identify it immediately?"

In 1946, something like fiscal stability arrived when the Smithsonian Institution—a U.S.-supported complex of museums and research facilities—took Barro Colorado into its administrative fold and founded the Smithsonian Tropical Research Institute. A new leader took over, Oxford-trained biologist Martin Moynihan. He tapped his Ivy League connections to attract scientists like Harvard's Ernst Mayr and other cutting-edge thinkers in the fledgling field of evolutionary biology. The Panamanian isthmus, which serves as both a bridge between two continents and wall between two oceans, was a treasure trove for scientists working on the basics of evolutionary history. And Barro Colorado itself, as a "new" island, was an invaluable real-time experiment in how species adapt to sudden isolation.

The science coming from Panama took a serious turn. The emphasis on evolutionary studies continued, and continues still. But the island and surrounding waters have also produced a steady stream of published research on animal behavior, marine molecular biology, climate change, forest dynamics and archaeology. It's a remarkable body of knowledge coming from such a small spot on the map. "If you compare papers per square meter of forest, I don't think we can be matched," says Egbert Leigh, an environmental theorist who has been a staff scientist here since 1969.

Year after year, scientists have continued to come. The research continued even through the tumultuous dictatorship of General Manuel Noriega, the one-time CIA affiliate turned suspected drug lord. BCI's scientific rhythm was broken only for a few days during the 1989 American invasion launched to knock Noriega from power. And now that the massive U.S. military and maintenance teams have turned the keys to the canal over to Panama, the Smithsonian Tropical Research Institute remains a thriving vestige of Panama's relationship with the United States. The official American presence is protected by treaty for the next 20 years, with a renewable lease.

Today, Zetek's first lab is still here, a simple, white clapboard monument to good construction practices and the hardiness of the island's first researchers. The building, now a visitors' center, sits atop a 196-step climb from the dock. Residents used to tell newcomers that if they couldn't make it up "The Stairs, "they weren't fit for the rigors of the island. A cable cart hoisted equipment up a steep ramp. Michael Robinson, who would later become director of the National Zoo in Washington, D.C., once watched his lifetime collection of spider specimens (as well as his furniture) plunge down the ramp and into the lagoon when

the cable broke.

A new compound was built in the '70s, during a funding boom that coincided with the explosion of ecological studies. Scientists, students and wildlife rangers now live in comfortable guest rooms and work in state-of-the-art labs. A freezer filled with carefully labeled seeds, leaves and animal dung sits next to a cooler filled with beer. On the bulletin board near the lounge, one notice reads: "REWARD. We need frogs found dead on BCI. There is a $5 reward for each dead frog, and a $30 reward for a person finding a mass mortality."

SNOOPING on canopy species such as this three-toed sloth (above center), researcher Steffen Schultz rides on a construction crane. On the ground, anthropologist Katie Milton (above right) looks for howler monkeys. New facilities (above left) support scientists, serving as a sort of Club Med.

Most of their time, however, is spent in the forest, or above it. Early one morning, German botanist Steffen Schultz climbs into a metal basket and speaks quickly into a radio. The basket lurches and begins to rise, higher and higher up the trunks of towering Panama trees, hoisted by a 165-foot construction crane mounted permanently in this forest. The now widespread technique of studying the canopy by a crane was invented here when Smithsonian researcher Alan Smith was inspired by construction activity in Panama City.

Schultz has come from Europe to study the orchids and epiphytes that dwell up here at the tiptop of the tropical world. In his few weeks on this crane at the eastern end of the Canal Zone, he has mapped 150 species and 15,000 individual plants within reach of his gondola.

Round and round he swings, 16 stories above the forest floor, noting as much as he can. Suddenly a patch of brown within the endless green catches his eye. "*Alto*" (stop), he says into the radio. The crane operator pauses, then maneuvers him within inches of where a sleeping sloth clings to a high branch. The sloth looks slowly over its shoulder at this surprise interruption, then returns, unflappable, to his extended nap.

"We see everything up here—spider monkeys, sloths, toucans, the most beautiful epiphytes," says Schultz with a smile. He's framed against the vista of jungle that spreads before his feet, a tropical paradise his for the intellectual taking. "For a scientist, this is heaven."

Steve Hendrix, formerly a roving editor of this magazine, is now a travel and outdoors writer for The Washington Post. *Lynda Richardson, who specializes in environmental photography, has traveled throughout Central America covering tropical forest animals and issues.*

Return to the table of contents.

Return to the *International Wildlife* main page.

Home | Contact Us | Search | Wildlife Work | Education | Take Action
Print & Film | Support NWF | Shopping | Get Outdoors | Kids Zone