

Close Encounters with Conservation: BELIZE

The following was co-authored by Indiana staff John Shuey and Paul Labus, who trekked to a remote part of Belize this summer to continue their butterfly research.

Walking through the mountain forest we come to a small clearing along a ridge top. Butterflies are feeding on the sap running down the trunks of several dead trees. We assume that the opening was created by a recent lightning strike, but our focus is on the butterflies. Sites such as this are rare in the deep forest; too often we get only a momentary glimpse of butterflies as they flit through the dense foliage. This opening offers a window to an insect community rarely seen. These butterflies live high above ground in the forest canopy in one of the most remote areas of the Maya Mountains of Belize.

We begin the process of capturing, identifying, and recording several species when something distinctly unfamiliar flies in from the adjacent canopy. It is perched high up where the flashes of dark metallic blue against its brown underside are like nothing we have seen. We think it is a member of the genus *Prepona*, but what species? The only thing to do is wait and see if it will venture down into the range our nets. After several hours and a few near misses we finally catch one. The speculation is *Prepona deiphile*, a species that ranges from Mexico to Brazil, but this would be the first record in Belize. Confirmation will come later when back in the States it can be compared with other specimens.

Here in Indiana we take certain things for granted in the conservation arena. For example, we know what trees, birds and fish occur in the State. More importantly, we know the distribution of most species and where the best sites for the rarest species are found. This is all thanks to the elaborate network of Heritage Programs in North America, which provides the raw information used by virtually all conservation efforts in the US. Indiana Heritage staff, which are part of the Indiana DNR's Division of Nature preserves, search throughout the state for the best examples of every habitat type, for new populations of imperiled species, and for those occasional but exciting new discoveries for the state. Most importantly, they document their information in a database that, once combined with data from the entire Heritage network, provides the comprehensive information that underpins the Conservancy's work throughout the country. (Visit www.NatureServe.org to see this data).

In the tropics, this detailed information is sorely lacking. Most Central American countries have at best, lists of species that are known from within their borders. Conservation strategies are typically based on conserving broad swaths of ecosystems—intact landscapes that have the potential to conserve many if not most of the individual species founding the country. But that still leaves question hanging: did we miss many species when we cast our broad conservation net?

Over the last several years, the two of us have made repeated trips to Belize to develop a better understanding of butterfly distributions in Belize. Belize is a small country, less than one fourth the size of Indiana. Nonetheless it supports almost 1,000 butterfly species, more than the United States and Canada combined. When we started the project, only half that number of species had been documented for Belize. As we systematically



● Doyle's Delight

sampled key habitats across the country—especially in the more remote corners of the country—our species list slowly grew. We targeted unusual or poorly known habitats; we sampled blazing hot savannas, seemingly vertical mountain terrain, sopping wet rainforest and even waded into coastal salt marshes. In the summer of 2006, we made our first extended effort into the Maya Mountain highlands of southern Belize. These mountains are not all that high nor all that remote, yet entry is exceedingly difficult. Local Mayan guides led us on a very rainy two-day trek into the forested mountains, and we set up camp for an extended week of work. Once the rains finally subsided, we discovered amazing butterflies: species thought to be restricted to small areas in Central Mexico and South American species that were known only as far north as Costa Rica. During that trip we found 50 butterfly species not previously known from Belize.

We decided that one more field effort was needed to round out our work. We were pondering our options when we heard a rumor about a planned expedition in August 2007 to the highest mountain ridge in the country, unofficially referred to as Doyle's Delight (named for its resemblance to the prehistoric setting of Arthur Conan Doyle's novel *The Lost World*). At 1,100m altitude, Doyle's Delight is over 300m higher than any habitat we had previously sampled. We had discussed this with our guides the previous summer, and they flatly told us that they would never hike up there again. Apparently it's not a pleasant hike, so we had given up on the idea. Luckily the rumor turned out to be true. The expedition was being organized by Sharon Matola, Director of the Belize Zoo, one of the best little zoos in the world. We contacted Sharon immediately and started begging, and evidently our references checked out.

Sharon had arranged for a small team of experts to look at plants, fungi, birds, reptiles, amphibians, beetles, butterflies and moths. We were in extremely capable company, and our team included Jan Meerman and Peter Kovarik. Jan knows more about the natural history of Belize than just about any other person, and Pete has helped us in the field for years. Sharon used every connection at her disposal to arrange military transport up the mountain. Specifically, an airlift to Doyle's Delight. This was a well-planned effort, with just one unavoidable glitch—the weather.

August is hurricane season, and Hurricane Dean, a category 5 behemoth, was aimed at northern Belize. We placed our faith and fate in the hands of the military, having decided that they probably had better information than we did about where exactly this storm was headed. We all felt pretty confident and comfortable when they decided to take us up on the 18th. After all we were headed to southern Belize and Dean was headed north. But once we were on Doyle's Delight, on our own for the next ten days, things tensed up a bit. On our second night it was obvious that we were under an arm of the storm, with no clue about what to expect. As it turns out, our faith in the military's judgment was well placed. The top wind speed was clocked at only 30 mph. Other than a few fallen limbs and fruits, our camp came through unscathed.

Once the weather turned, Doyle's Delight turned out to be everything we had hoped for. We were camping at the high point, and our group gradually developed a network of newly cut trails that followed ridge lines and valleys outward for a few kilometers from camp. The scenery was spectacular, with overlooks though the mountain tops and hidden waterfalls in the valleys below. The vegetation was unusual as well, from palm lined ridges (we suspect that the very flexible palms are the only tall trees that can withstand the winds that whip across the ridge tops) to dense rainforest in the sheltered valleys. Previous expeditions had noted that the high ridges were cloaked with a spectacular, but undescribed (that is, new to science) species of bamboo that grows over 20 feet tall. To our disappointment, the bamboo had apparently flowered in mass perhaps three months



ago, and was now thoroughly dead, except for the millions of tiny seedlings that carpeted the ground. It might be decades before this species flowered again, and in order to be described and identified, a specialist would need to see the flowers. Over a dozen people spent the next eight days looking for live bamboo and amazingly towards the end of the week, Jan stumbled onto exactly one plant, tucked away in a cool ravine, that was still alive and in bloom. The plant had just a few flowers remaining, but that should be enough.

As the days passed and we worked the trails, we began to develop a feel for the butterfly community. Many of the species were similar to those we had seen last year in the mountains just 15 miles or so south of us. But a handful of species were new to us, including some that were common at Doyle's Delight. We think these are likely restricted to the higher altitudes and are not likely to be found elsewhere in the country. Towards the end of the expedition, we had accumulated perhaps 10 species new to the country and many species that are otherwise quite rare in Belize.

As we tore down our camp preparing to leave, the weather threw us yet another curve. Below us a tropical depression was pounding the airbase, and very heavy rainfall was causing flash flooding. By that afternoon, we had our tents back up, and settled in for another night. But the next day, low clouds made it virtually impossible for the helicopter to approach us. We could hear it circling us on a regular basis, but they were having great difficulty locating us. But eventually they did, and we made it off the big hill and are now processing samples, identifying butterflies, and logging data.

Of the 120 sites in Belize we have sampled, Doyle's Delight was the most intriguing. Our distribution data, when combined with all the work completed by Jan Meerman, allows us for the first time to confidently associate many species with restricted habitat types, ecological disturbance, soil types or other factors that control their distribution. Together, we have over 25,000 discreet records for Belize butterflies. It sounds like a lot, but it's really just a start toward creating the type of information we take for granted here in Indiana.



Some of the butterflies of Belize (from left to right, top to bottom): Least Prepona (*Prepona dexamenusi*), Great Leafwing, (*Memphis proserpina*), Blue-and-yellow Beautymark (*Ancyluris inca*), and Grinning Heliconian (*Heliconius cydno*)