

IN SEARCH OF THE JAMAICAN ROCK IGUANA ROBERT W. EHRIG

In the Spring of 1990, a good friend recounted his trip to the Hellshire Hills in southern Jamaica. He was there to collect seed and propagate plants on behalf of a West Indian botanical garden in Manalapan, Florida. Prior to his journey, I asked him to pay close attention for any signs of the Jamaican Rock Iguana, *Cyclura collei*, a rare, or possibly extinct, species. He saw none, but his detailed description of the rugged terrain and vegetation gave me hope that this iguana still survived.

The Hellshire Hills is a 44 square mile, uninhabited area that juts out from the south Jamaican coast. It is the driest region on one of the Caribbean's wettest islands. Rainfall varies from 45 inches annually in the northwest part of the hills, to near 20 inches in the southeast. Located a mere 15 miles west of Kingston, the island's capitol and largest city (population 750,000), the Hellshire Hills have remained unpopulated due to the lack of fresh water.

The vegetation of the Hellshire Hills is West Indian Dry Hardwood Forest. With the possible exception of areas in the Dominican Republic, this is the most diverse dry forest in the Caribbean (see Table 1). The forest canopy, on the average, is 30 feet high and relatively open. Huge Kapok trees, *Ceiba pentandra*, tower over the surrounding vegetation. Semaphore cactus, *Opuntia spinosissima*, grow tree-like to heights of 10-15 feet. Many have bird nests in their crowns. Giant columnar cacti, *Cephalocereus swartzii*, grow saguaro-like up to 25 feet, some adorned with purple orchids, *Broughtonia sanguinea*, blooming on their trunks. Jamaican fan palms, *Coccothrinax jamaicensis*, grow throughout the forest and up the sides of cliffs, reaching dramatic heights of 35 feet. The Thatch palm, *Thrinax parviflora*, grows in the lower areas and near the sea. The red-barked, Gumbo Limbo tree, *Bursera simaruba*, is common throughout the area. An exotic member of the flora is the Calabash or Gourd tree, *Crescentia cujete*, whose dried fruit are used to make maracas.

The Hellshire Hills is the supreme example of West Indian Karst Limestone formation and, without doubt, one of the roughest spots in the West Indies. The rock is sharp and pitted, and can render even the best boot soles to shreds in a matter of hours. The Cubans descriptively refer to Karst formation as "diente del perro", which translates to "dog's teeth"! The landscape is grayish and tortured, with an abundance of plant life bursting from cracks in its surface. Although the highest elevation is only 740 feet, elevations change drastically over short distances, making a hike very difficult. There is a maze of abrupt limestone ridges with holes 20 to 30 feet deep appearing in unexpected places, so foot travel is a dangerous experience. Furthermore, day-time temperatures can reach 94°F, and a good supply of drinking water is mandatory to avoid heat exhaustion.

On August 2, 1990 (a few days after papers were filed to incorporate I.I.S.), I received word that a specimen of Jamaican Rock Iguana had been captured by a hog hunter in the Hellshire Hills. Unfortunately, the animal had been injured and it died on August 13 at Hope Zoo in Kingston where it had been taken. I flew to Jamaica on August 17, with the idea of searching the area where the iguana had been captured. With few preconceived plans, I provisioned for the long trek.

Early on the morning of August 19, 1990, I.I.S. member Dan Byrd, a Jamaican guide, and I began the long hike into the Hellshire Hills along a burro trail. The intense heat and weight

of our supply packs and water bags took their toll. The first three hours were spent walking uphill on a very rocky track. When we reached the top of a particularly steep stretch, I pulled off my sweat-soaked shirt and wrung it out. Our guide politely protested, "No..... that good water, mon"! At that point, I knew we were in for an interesting, as well as demanding, trip. After the better part of the first day was gone, we had managed to make only three miles, but the discovery of an iguana dropping pulled us out of our exhaustion. After a meal of nuts, crackers, and Gatorade, we searched the area carefully, and found mostly pig scats, and one more iguana dropping. It was characteristically shaped, of appropriate size, and contained seeds of the Jamaican caper. We also found droppings of the Jamaican hutia or coney, a small, native, guinea pig-like rodent. The rugged beauty of the hills faded as the sun dropped rapidly behind the ridge in front of us. I sat and momentarily contemplated what tomorrow would bring.

We spent the next morning in a thorough but fruitless search for iguanas or their droppings. Many cliff faces were climbed and holes and crevices searched. I became convinced that iguanas were certainly not numerous. Shortly before 11:00 a.m., fresh iguana tail drags were discovered in a patch of loose, red soil. They were unmistakable and indicated the presence of two different individuals. The excitement momentarily revived our spirits and we considered spending more time in the vicinity, but we decided it was time to return to our supplies. On the way to our provisions, at 12:10 p.m. on August 20, 1990, a large, dark-colored, Jamaican Rock Iguana dashed across our path and up a steep cliff face to our left. Climbing slowly and cautiously some 70 feet up the cliff face, I got one brief look at the animal before it disappeared into a deep cave in the cliff rocks. This was the first sighting of *Cyclura collei* in the wild by a non-hunting group in nearly forty years. The remainder of the trip was almost anticlimactic.

During my short stay in Jamaica, I learned that Dr. Peter Vogel of the University of the West Indies was planning a five-week survey of the Hellshire Hills for iguanas. In the weeks that followed, I received word that his survey team had recorded 24 sightings of *Cyclura collei*, and these probably represented at least eight different animals.

Stimulated by the news, I returned to Jamaica on October 12, accompanied by society member Curtis Kruer, a veteran field biologist and researcher. This second trip was only marred by a massive hatching of mosquitos, making our four days rougher than I could have imagined. Sleep was elusive. Our only new find on this second trip was the discovery of iguana eggshells on the surface of an apparent nesting area. The eggs were a bit smaller than other *Cyclura* eggs with which I'm familiar. Did this mean a small female, or does *Cyclura collei* produce smaller hatchlings? We at least knew there was one female still laying eggs, increasing our optimism that the population, as a whole, was still viable. Egg shells on the surface, however, indicated to us that the nest may have been dug up by a predator, or that a female had excavated an old nest site.

We know very little about *Cyclura collei* at this time. Although the number of museum specimens in U.S. collections is small, it seems to have its closest affinities to the Rhinoceros Iguana, *Cyclura cornuta*, of Hispaniola. In scale counts, it is closer to *C. cornuta* than to *C. cyclura* or *C. nubila*. *Cyclura collei* has enlarged frontal and pre-frontal scales, but they are not developed into horns as in the Rhino Iguana. The dorsal crest is pronounced (as in male Cuban Iguanas), but it does not seem that sexual dimorphism is great in this species, a trait also shared with *C. cornuta*. Geographically, it is closest to *C. cornuta* since it is known only from southern Jamaica.

Cyclura collei is Jamaica's largest native land vertebrate, with the possible exception of large specimens of the Yellow Boa, *Epicrates subflavus*. Like all *Cyclura*, *C. collei* is herbivorous and diurnal, preferring rocky limestone terrain with many crevices for dens and temporary retreats.

The Jamaican Rock Iguana was common throughout dry southeastern Jamaica until about 1820. It occurred on the Liguanea Plain (Ligany to Jamaicans today) where Kingston is now located. Initially, hunting was the primary factor for its decline, but it had been hunted since pre-Columbian times by Arawak Indians who used it for food. Introduction of the Indian Mongoose, *Herpestes auro punctatus*, to Jamaica in 1872 undoubtedly contributed greatly to the mortality of hatchling and young iguanas. Also, predation by dogs and cats, nest predation by hogs, and competition from livestock all contributed to the downward spiral of the iguana population. By 1910, *Cyclura collei* was limited to the rough interior of the Hellshire Hills and the Goat Islands. Iguanas on the Goat Islands were used for target practice by U.S. Naval personnel during World War II. Their extirpation from the Goat Islands was hastened by collection of 22 iguanas for a breeding program that was to later fail (J.D. Woodley, pers. comm. to R. Montanucci). In recent years, *Cyclura collei* has been generally conceded to be extinct.



C. Collei male Peter Vogel

If the Jamaican Iguana, and the Hellshire Hills as an ecosystem, are to survive into the next century, some difficult problems will have to be solved quickly. Today, feral hogs, lean animals weighing up to 120 lbs., roam the Hellshire Hills by the hundreds. They have been kept in check over the years by about a dozen hog hunters, but their presence continues to threaten the iguana's future, as well as that of other reptiles. Until very recently, hog hunters have been the only people to see iguanas, usually after one of their dogs had killed one. The Indian Mongoose occurs in the hills but apparently it is somewhat limited by the aridity of the area. The Jamaican Yellow boa, one of the most beautiful *Epicrates*, is undoubtedly much rarer than it would be due to the presence of these exotic predators. Likewise, the Galliwasp, *Diploglossus crusculus*, and Woodslave, *Mabuya sillonotus*, are present but much rarer than these interesting lizards should be.

The perimeters of the Hellshire Hills are being rapidly deforested. In Jamaica, the main cooking fuel is charcoal, and the demand for this fuel is increasing, as is its price, with the threat of war in the Middle East. The forest trees are cut, stacked in piles, and burned to make charcoal which is then bagged and hauled away on the backs of donkeys. The process that so effectively destroyed Haiti's ecology is being repeated in Jamaica. In less than two months, the deforestation has advanced to within half a mile of where iguanas have been sighted.

Jamaica is an exciting island nation with a rich, vibrant culture. It is amazing that this small Caribbean country has had such a tremendous musical-cultural influence worldwide. Although endowed richly with natural resources, its unique and varied ecosystems are in danger as never before. Part of the solution to Jamaica's problems may lie in its fledgling national park system. Expanding the nation's economy through eco-tourism would seem to be the best hope for bolstering its people's standard of living and at the same time, protecting their unique natural heritage. Already, the Montego Bay Marine Park and Blue Mountain National Park are both in the process of being established. Blue Mountain, located 25-30 miles northeast of Kingston, will protect a large part of the Caribbean's wettest ecosystem and become Jamaica's latest tourist drawing card. The perfect complement to this park would be to protect the unique dry forest ecosystem southwest of Kingston as the "Hellshire Hills National Park." The development of eco-tourism and other sustainable economies will hopefully become Jamaica's future endeavor. The Hope Zoo is now expanding to promote its public education programs, which will help Jamaican children learn about and appreciate their natural world.

The urgent tasks ahead include the rehabilitation of Jamaican Rock Iguana population, as well as other species of reptiles and birds in jeopardy. This can best be accomplished by a systematic program of removal of feral predators and competitors. Simultaneously, an alternative, sustainable economy is needed to replace the destructive process of charcoal production.

It is amazing that one of the premiere West Indian wilderness areas lies less than 20 miles from one of the most densely populated urban areas in the Caribbean. The Hellshire Hills invokes a feeling of total isolation from the rest of the bustling world. I came away from the Hellshire enriched by the few days I had spent there and by the fleeting glimpse I had caught of a creature that now has only a toe-hold on survival. Will we lose this strange and hostile, yet beautiful part of the Caribbean? I hope not.

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Note: Hawksbill Turtle, *Eretmochelys imbricata*, has important nesting areas on the beaches of Hellshire. Southwestern Hellshire has large salt pond and mangrove swamp areas which serve as a Jamaican stronghold of the American Crocodile, *Crocodylus acutus*. Birdlife is phenomenal.



Table 1. Trees and shrubs of the Hellshire Hills, Jamaica

SCIENTIFIC NAME	COMMON NAME	FAMILY
<i>Acacia macracantha</i>		Fabaceae
<i>Acacia pinetorum</i>		
<i>Acacia tortuosa</i>		
<i>Agave sobolifera</i>	Century plant	Agavaceae
<i>Amyris elemifera</i>	Torchwood	Rutaceae
<i>Ateramnus lucidus</i>	Crabwood	Euphorbiaceae
<i>Bourreria baccata</i>	Strongbark	Boraginaceae
<i>Bourreria venosa</i>		
<i>Broughtonia sanguinea</i>	Orchid	Orchidaceae
<i>Bumelia americana</i>		Sapotaceae
<i>Bumelia nigra</i>		
<i>Bumelia rotundifolia</i>		
<i>Bumelia salicifolia</i>	Bustic	
<i>Bursera simaruba</i>	Red Birch	Burseraceae
<i>Bursera simplicifolia</i>		
<i>Calliandra pilosa</i>		Fabaceae
<i>Calliandra portoricensis</i>		
<i>Calyptranthes pallens</i>	Spicewood	Myrtaceae
<i>Calyptranthes zuzygium</i>		
<i>Canella winterana</i>	Cinnamonbark	Canellaceae
<i>Capparis cynophallophora</i>	Jamaica caper	Capparaceae
<i>Capparis flexuosa</i>		
<i>Capparis ferruginea</i>		
<i>Cassia chapmanii</i>		Fabaceae
<i>Cassia emarginata</i>		
<i>Celtis iguanaea</i>		Ulmaceae
<i>Ceiba pentandra</i>	Silk tree	Bombacaceae
<i>Cephalocereus swartzii</i>	Columnar cactus	Cactaceae
<i>Cereus pentagonus</i>		
<i>Chloris petraea</i>		Poaceae
<i>Cissus sicyoides</i>		Vitaceae
<i>Clusia flava</i>	Autograph tree	Clusiaceae
<i>Coccoloba diversifolia</i>	Pigeon plum	Polygonaceae
<i>Coccoloba krugii</i>		
<i>Coccoloba tenuifolia</i>		
<i>Coccoloba uvifera</i>	Seagrape	
<i>Coccothrinax jamaicense</i>	Fan palm	Arecaceae
<i>Cordia brownii</i>		Boraginaceae
<i>Cordia bullata</i>		
<i>Cordia gerascanthus</i>		
<i>Cordia globosa</i>		

Table 1. (continued)

<i>Cordia sebestena</i>		
<i>Crescentia cujete</i>	Calabash	Bignoniaceae
<i>Crossopetalum rhacoma</i>		Celastraceae
<i>Croton</i> (5 spp.)		Euphorbiaceae
<i>Dalbergia ecastaphyllum</i>		Fabaceae
<i>Drypetes lateriflora</i>	Guiana plum	Euphorbiaceae
<i>Erithalis fruticosa</i>	Black torch	Rubiaceae
<i>Eugenia axillaris</i>	White stopper	Myrtaceae
<i>Eugenia biflora</i>		
<i>Eugenia foetida</i>	Spanish stopper	
<i>Eugenia rhombea</i>	Red stopper	
<i>Exostema caribaeum</i>	Princewood	Rubiaceae
<i>Ficus citrifolia</i>	Fig tree	Moraceae
<i>Forestiera segregata</i>	Privet	Oleaceae
<i>Galactia</i> (4 spp.)		Fabaceae
<i>Guaiacum officinale</i>	Lignum vitae	Zygophyllaceae
<i>Guapira discolor</i>	Blolly	Nyctaginaceae
<i>Guapira fragrans</i>		
<i>Guapira obtusata</i>		
<i>Guettarda elliptica</i>	Velvet seed	Rubiaceae
<i>Hibiscus clypeatus</i>		Malvaceae
<i>Hibiscus tiliaceus</i>		
<i>Hippomane mancinella</i>	Manchineel	Euphorbiaceae
<i>Hylocereus triangularis</i>	Night blooming cereus	Cactaceae
<i>Hypelate trifoliata</i>	White ironwood	Sapindaceae
<i>Jacquinia arborea</i>		Theophrastaceae
<i>Jacquinia keyensis</i>	Joewood	
<i>Jatropha gossypifolia</i>		Euphorbiaceae
<i>Krugiodendron ferreum</i>	Black ironwood	Rhamnaceae
<i>Lantana involucrata</i>	Lantana	Verbenaceae
<i>Lasiacis divaricata</i>	Wild bamboo	Poaceae
<i>Manilkara bahamensis</i>	Wild dilly	Sapotaceae
<i>Maytenus jamaicensis</i>		Celastraceae
<i>Melocactus communis</i>	Turk's cap	Cactaceae
<i>Metopium toxiferum</i>	Hog doctor	Anacardiaceae
<i>Morinda royoc</i>	Cheese plant	Rubiaceae
<i>Myrsine floridana</i>	Myrsine	Myrsinaceae
<i>Nectandra coriacea</i>	Lancewood	Lauraceae
<i>Opuntia spinosissima</i>	Semaphore cactus	Cactaceae
<i>Passiflora perfoliata</i>		Passifloraceae
<i>Peltophorum linnaei</i>		
<i>Piscidia piscipula</i>	Dogwood	Fabaceae

Table 1. (continued)

<i>Pithecellobium guadalupense</i>	Blackbead	Fabaceae
<i>Plumeria obtusa</i>	Frangipani	Apocynaceae
<i>Randia aculeata</i>		Rubiaceae
<i>Reynosa septentrionalis</i>	Darling plum	Rhamnaceae
<i>Salicornia perennis</i>		Chenopodiaceae
<i>Scaevola pulmeri</i>		Goodeniaceae
<i>Selenicereus grandiflorus</i>	Worm cactus	Cactaceae
<i>Stenocereus hystrix</i>		Cactaceae
<i>Suriana maritima</i>	Bay cedar	Surianaceae
<i>Tabebuia riparia</i>	White cedar	Bignoniaceae
<i>Tillandsia (6 spp.)</i>	Air plant	Bromeliaceae
<i>Thrinax parviflora</i>	Thatch palm	Arecaceae
<i>Ximena americana</i>	Hog plum	Olacaceae
<i>Zanthoxylum flavum</i>		Rutaceae
<i>Ziziphus sarcomphalus</i>		Rhamnaceae

Many of the plants in Hellshire are found throughout large areas of the West Indies. Others are endemic to Jamaica. The majority of plants native to Hellshire are known to be utilized as food by iguana. In some plant species only the fruit or flowers are eaten. In others, leaves are also ingested. Probably more than 80% of the flora is used at least seasonally. The various habitats present in Hellshire are a virtual supermarket for the Jamaican Iguana.

The International Iguana Society, Inc. is an international membership non-profit organization dedicated to the preservation of the biological diversity of the Iguanas through habitat preservation, active conservation, research, and the dissemination of information. *Iguana Times*, the newsletter of the Society is distributed quarterly to members and member organizations. Additional copies are available at a cost of \$4.00 including postage.



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