

In Caribbean, Endangered Iguanas Get Their Day

by Mark Derr

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While hunting hogs deep in the rugged Hellshire Hills of Jamaica one day in June 1990, Edwin Duffus rescued a large lizard from his dogs and carried it four hours by foot and bicycle to his home and ultimately to Kingston's Hope Zoo.

There, Dr. Peter Vogel, a herpetologist at the University of the West Indies, and Rhema Kerr, a zoo curator, identified the lizard as a Jamaican iguana, believed extinct for nearly 50 years.

The rediscovery inspired an intensive effort to save both the Jamaican iguana and the dry tropical forest of the Hellshire Hills that is its last redoubt. After several exhaustive surveys, Dr. Vogel has estimated the iguana population at fewer than 100.

"The Hellshire Hills has the most significant natural dry forest left in the Caribbean," Dr. Vogel said. "Preserving it is key to the Jamaican iguana's survival and to maintaining the area's biodiversity."

The Jamaican iguana's return from oblivion also focused international attention on the plight of all West Indian iguanas, said Dr. Allison C. Alberts, head of ecology at the San Diego Zoo. In 1997, the World Conservation Union declared these iguanas of the Caribbean islands "the most endangered lizards in the world" and organized a group of scientists devoted to their preservation.

Dr. Alberts is co-chairman of that group and the editor of a report issued by the World Conservation Union in August that summarizes what is known about the genetics, evolution and ecology of West Indian iguanas, the threats to their survival and programs to preserve them. The two most imperiled, she said, are the Anegada iguana, found only on the island for which it is named in the British Virgin Islands, and the Jamaican iguana. The Anegada iguana was once common on Puerto Rico and throughout the Virgin Islands.

Genetic analyses to be published in *The Journal of Molecular Phylogenetics and Evolution* show that the Anegada iguana is the oldest member of the genus *Cyclura*, dating back 15 million to 35 million years. The research was conducted by Catherine Malone, a doctoral candidate in genetics at Texas A&M University.

As the Caribbean archipelago took its present shape, wind and ocean currents occasionally carried iguanas to more western islands, where, isolated, they evolved into 8 species and 16 subspecies.

Every major island has its own species of *Cyclura* iguana, and Hispaniola has two. (Two species of iguana found on islands of the Lesser Antilles are from a different genus.)

Next to the Anegada iguana, Ms. Malone found the Jamaican iguana to be the most genetically distinctive and biologically

important species of the group. But inbreeding necessitated by its small numbers has forced the Jamaican iguana into a genetic bottleneck, making it susceptible to dangerous mutations, parasites and disease.

Before European colonization, West Indian iguanas were the largest terrestrial herbivores on their islands, where they dwelled in dry forests and thorny scrub. The lizards can live 40 years, and some, like the Jamaican and Cuban iguanas, can reach five feet in length and weigh around 17 pounds. The iguanas played an important role in island ecology, Dr. Alberts said. According to the recent research, seeds passing through the iguanas' digestive tracts and then dispersed germinate faster and grow better than others.

The iguanas' only natural predators were raptors and snakes. They also served as an important food for the Indians, and are still eaten on some islands. But Europeans and their animals have greatly altered the ecology of the Caribbean archi-



pelago. Goats strip bare the vegetation on which iguanas feed; pigs and cattle disturb nests; cats, rats and Indian mongooses feast on hatchlings and eggs; and dogs kill mature animals.

More recently, resorts and housing developments on some Caribbean islands have reduced iguana habitats to almost nothing and forced scientists to move animals to safe havens on small, unpopulated islands. But sometimes there is little to eat and no place for an iguana to hide.

"There has been an 80 percent decline in the population of the Anegada iguana since the 1960's, due mostly to feral cats," Dr. Alberts said. In 1997, with fewer than 200 Anegada iguanas thought to exist and none reaching maturity, biologists began collecting hatchlings and raising them in a special site for release when they are too large for cats to attack. But the key to their preservation, experts agree, is removal of the feral cats.

The situation in Jamaica is more complex, Dr. Vogel said. Once so abundant in southeastern Jamaica that the coastal area around Kingston was named the Liguanea Plain, the native word for the lizards, the iguana population crashed after the human population doubled in the second half of the 19th century and the Indian mongoose was introduced in 1872. Imported to kill nocturnal rats devastating sugar cane fields, the mongooses feasted instead on bird, snake and reptile eggs and hatchlings.

In developed areas, cats and dogs contributed to the slaughter. By the end of the 1940's, the Jamaican iguana was generally considered extinct.

The conservation effort begun in Jamaica in 1990 has concentrated on protecting the last two nesting sites in the south-central Hellshire Hills and collecting half the hatchlings and raising them at the Hope Zoo, which now holds 100 juveniles. After three to four years, when they are too large to be mongoose prey, some of these iguanas are released. Others are kept as a genetic reservoir.

Since 1996, biologists have released 26 iguanas, each equipped with a miniature radio

transmitter for monitoring their movements. For the first several years, the abrasive limestone of the Hellshire Hills quickly destroyed the special vests holding those transmitters. So last year, after being approached by researchers, the Nike company provided vests custom-made of abrasive-resistant fabric, said Richard Hudson, a conservation biologist for the Fort Worth Zoo, who works extensively in the Caribbean.

All the released iguanas have survived, leading Mr. Hudson and other biologists to conclude that the lizards are "hard-wired" for life in the wild.

Last year, Dr. Vogel said, a released female nested for the first time. But a captive breeding program under way at the Hope Zoo and six American zoos has failed to produce any offspring, for still unknown reasons.

Since 1997, field workers have trapped and killed mongooses in iguana territory. They also try to persuade dog owners — usually pig hunters and people who gather hardwood for charcoal — to keep their pets out of the area. But, Dr. Vogel cautioned, each year the charcoal makers push deeper into the Hellshire Hills in search of mature trees, driving the pig hunters before them. Without greater protection, he fears that dogs and people may overrun the iguanas' range.

Last fall, the government of Jamaica established the Portland Bight Protected Area, including the Hellshire Hills, but the preserve is not yet being managed and there are plans to build roads and houses and to mine limestone in the forest's interior, Dr. Vogel said. Until those plans are dropped, conservationists fear for the iguana and a number of other



species that live only in the Hellshire Hills. While recognizing that the Jamaican iguana and several of its cousins still teeter on the brink of extinction, biologists seeking to rescue the endangered animals remain optimistic that they will succeed, in large part because of increasing public awareness in the Caribbean and abroad.

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Andros iguana, *Cyclura cyclura cyclura*, on South Bight, Andros Islands, Bahamas. Photograph by John Bendon.