UTILA: Home to Three Native Iguanas

Utila, site of the 2003 IIS Conference (see related stories, p. 32 and 59), is the smallest of the principal Honduran Bay Islands (41 km^2). This relatively tiny body of land, however, supports a phenomenal reptilian diversity (see Species Profile, p. 36) that includes three native species of iguanas (*Ctenosaura bakeri*, *C. similis*, and *Iguana iguana*) — the only island so blessed anywhere in the world.

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"Why do humans have an apparently insatiable desire to take something natural and beautiful, chop it down or kill it, cover it over with cement, and then proceed immediately to the local lumber, nursery, and pet stores to purchase poor copies of what they just destroyed?"

John Binns, IIS Director

Adult female *Ctenosaura bakeri* on a mangrove branch. *Photograph by Robert Powell.*

Adult male *Iguana iguana* at the Utila Iguana Research and Breeding Station. *Photograph by John Binns.*

Adult male *Ctenosaura similis;* note the aggressive reaction to the photographer in the photo to the left. *Photographs by Sandy Echternacht.*

Utila Island Swampers

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"Swampers," as the endemic Utila Spiny-tailed Iguanas (*Ctenosaura bakeri*) are called locally, are arguably the most remarkable inhabitants of little Utila Island. Differing from all other species of *Ctenosaura*, which live almost exclusively in dry, open, sunny areas, *C. bakeri is* limited to mangrove swamps.

Maximum known size is 315 mm (head-body length) and 923 g for males and 229 mm and 424 g for females. Although ctenosaurs often are called "Black Iguanas," Swampers are relatively colorful. Juveniles are largely uniformly blackish-brown with a few darker brown stripes on the upper side of the body and tail (coloration that renders them quite cryptic against the muddy substrates of the swamp). Adults, in contrast, vary from grayish-brown to an amazing turquoise, which is most obvious in bright sunlight.

Living exclusively in a mangrove swamp requires special adaptations, including the need to deal with a salty diet and the lack of freshwater. In addition, the substrate is muddy and frequently submerged during high tides, forcing Swampers into the trees — where the only retreats are naturally occurring tree holes. Suitable trees with holes are very much in demand. Juveniles and adults are strongly territorial and will strenuously defend their home trees even against larger opponents. Tree holes are mostly restricted to older mangroves, especially Black Mangroves (*Avicennia germinans*), which are scattered on Utila. The result is a patchwork-like distribution of *C. bakeri*, even in otherwise apparently suitable habitat.

Adult male *Ctenosaura bakeri* from Iron Bound. *Photograph by Robert Powell.*

An adult male "Swamper" (*Ctenosaura bakeri*) basking on a mangrove stump near the canal. *Photograph by A.C. Echternacht.*

The few other reptiles known to be mangrove specialists are exclusively carnivorous. Swampers, however, are omnivorous. Mangrove leaves and, if available, mangrove flowers form the main part of the diet. The second largest part of the diet is fiddler crabs, which have been found in 72% of analyzed scat. To catch crabs, iguanas wait for low tide and either forage actively for prey or, usually with more success, employ a sit-and-wait strategy until a crab crawls within range. The fact that mangrove leaves contain only 7% crude protein versus 34% in crabs may explain the intensive efforts to hunt crabs. Both mangrove leaves and crabs are salty, which creates an osmotic problem for Swampers. Since freshwater is available only during the rainy season, water usually is acquired with food (50–70% water) or by drinking the brackish swamp water. Reptilian kidneys are unable to excrete excessive salt, so most is eliminated by specialized salt glands located in the nasal cavity. In effect, the salt is sneezed out.

Reproductive activity occurs during the dry season. Triggered by decreases in rainfall (to <200 mm/m^2) and increases in air temperature (to >24°C), usually from late January through March, adult males begin patrolling the invisible border around a mating territory, using displays and aggressive behavior to exclude male intruders. Egglaying takes place from mid-March through early May, when the ground temperature is about 30°C. Hatching usually occurs from mid-June to early August, before the onset of the next rainy season. In association with recent warming trends, a shift of the entire reproductive season to as much as two weeks earlier has been recorded.

Because of the saturated substrate, gravid females must migrate to nesting sites, which are restricted to a few sandy beaches. Females may travel up to 1.3 km

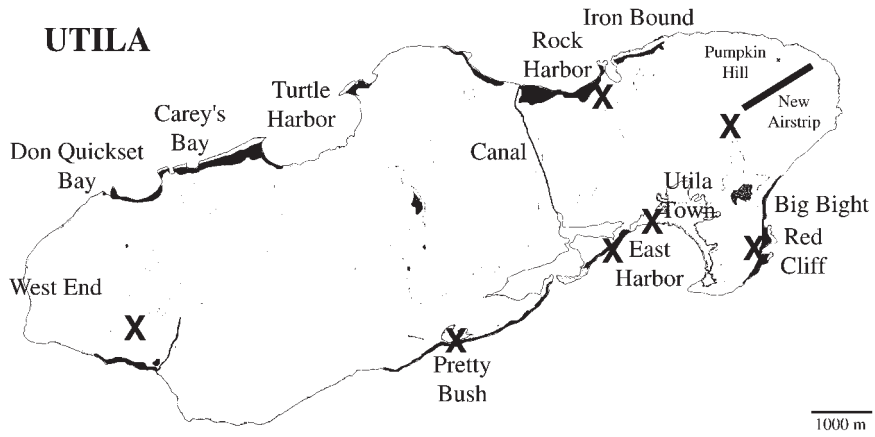
A female *Ctenosaura bakeri* on a mangrove stump. *Photograph by John Binns.*

(direct line) to lay their eggs before returning to their home tree in the swamp. Nesting sites must have sandy, well-drained soil and realize an average incubation temperature of 30.5°C. Females stay at the beach for several days, searching for a suitable nesting site at up to 50°C surface temperatures. Nesting tunnels range from 510–1240 mm in length and nesting chamber are at depths of 150–450 mm. Clutches contain 6–16 eggs. Three months later, hatchlings emerge and head straight for the mangroves.

Large Brown Basilisks (*Basiliscus vittatus*), Great-tailed Grackles (*Quiscalus mexicanus*), raptors, and snakes all prey on juvenile iguanas, but only large boas (*Boa constrictor*) pose a significant threat to adults. Consequently, the major threats to *C. bakeri* are increases in uncontrolled human development and the consequent loss of habitat.

The total range of *C. bakeri* on Utila consists of three separate mangrove areas with a total area of about 10 km^2. Egglaying areas are much more limited and have a total size of less than 1 km^2. As a result, **Utila Iguanas have the smallest and most threatened distribution of any ctenosaur. Population numbers will invariably decrease in the near future if the habitat, especially the nesting areas, becomes unavailable.**

Although, hunting still occurs despite regulations against it, tourism and land sales that are increasing the extent of Utila Town are of greater concern. These result in deforestation or despoilment of mangrove areas with landfills. Sandy beaches are in great demand for development, so nesting sites close to town are cleared of debris, rendering them unsuitable for iguanas even before construction begins. Invasive plants also overgrow the open nesting sites and must be controlled.



The distribution of *Ctenosaura bakeri* on Utila Island (gray areas) corresponds closely to stands of old mangrove forest, especially large Black Mangroves with tree holes. Females must migrate to nesting beaches (dark gray) in order to lay their eggs. **All** nesting beaches are in imminent danger of development. Other threats to the species are indicated with X's: the area near West End is being deforested; Utila Town, especially near the new airstrip, and Pretty Bush are expanding into Swamper habitats and garbage is being dumped into the mangrove forests; iguanas in areas near East Harbor, Rock Harbor, and Red Cliff remain vulnerable to hunting, which continues despite prohibitions. *Modified from a figure by Alex Gutsche.*

Protection of suitable mangrove areas and nesting sites is critical — and must be implemented as quickly as possible. All beaches are privately owned, so purchasing key stretches for the use of iguanas is the only solution. Creating an iguana refuge on Utila will enhance the likelihood of the Utila Iguana's long-term survival and also would serve to protect areas used as roosts by migratory birds and as nesting sites for critically endangered Loggerhead and Hawksbill turtles.

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As might be expected when three large species with generally similar lifestyles occupy such a small area, they must in some way partition the severely limited resources in order to avoid direct and mutually disoperative competition. In fact, these iguanas are largely restricted to distinctly different habitats. Green Iguanas (*I. iguana*) inhabit the remaining upland forests, where continuous canopies allow them to remain inconspicuously hidden in the treetops — except when the females are forced to descend in order to nest. Black Iguanas (*C. similis*), referred to locally as "Highlanders," favor more open areas, occupying forest edges and rockpiles, fallen logs, or isolated trees in otherwise open fields. These lizards are quite capable of effectively utilizing heavily disturbed areas and frequently coexist closely with humans (seeing individuals basking on rooftops or along heavily traveled roads is quite common). Unlike Green and Black iguanas, both of which have broad distributions throughout the entire Neotropics and Middle America, respectively, the Utila Iguana (*C. bakeri*) is found only on Utila. Possibly because of their smaller size or more retiring nature, Utila Iguanas are found only in the apparently inhospitable mangrove swamps, where they fare quite well on a diet of mangrove leaves supplemented with small fiddler crabs. Known to the local Utilians as "Swampers," Utila Iguanas do face a problem when nesting seasons roll around. Since the swamps are regularly inundated and the soils totally saturated with brackish water, they are unsuitable nesting sites. Instead, females must migrate considerable distances to one of the relatively few sandy beaches (only 38 ha on the entire island) to lay their eggs. Interestingly, when they return, they reestablish residence in the very same mangrove they left some weeks before. How they find their homes with such inerring accuracy despite the bewildering similarities of one tangled tree and the next is one of several mysteries surrounding this ecologically unique iguana.

Brief History of the Iguana Station

Karsten Gees, Director
Utila Iguana Research and Breeding Station

The story began with an American Consul at the end of the 19th century. While visiting Utila, he collected some iguanas in the mangroves and sent them to the Washington Zoo. The zoo director, a Mr. Baker, sent these animals to the famous herpetologist, Leonhard Stejneger at the National Museum of Natural History in Washington, DC. Stejneger determined that the iguanas of Utila were a new species, and he described them formally in 1901, giving the Utila "Swamper" the name *Ctenosaura bakeri* in honor of Mr. Baker.

The herpetological world essentially forgot about *C. bakeri* until 1994, when a group of German researchers led by Gunther Köhler rediscovered these iguanas in the wild. In the following years, the group determined that *C. bakeri* is endemic to Utila and that its habitat is restricted to the mangrove swamps, with a total area of only 8 km^2 (see article on p. 28). Furthermore, they found that *C. bakeri* is threatened by hunting and by the unchecked development of infrastructure for the burgeoning tourist industry. Thus was born the Conservation and Research Project Utila Iguana. In 1997, a breeding program was established to support the wild population. Half of the hatchlings each year are released immediately to the wild while the others are reared at the Station for one year* before release. Concurrently, an ongoing research program was initiated for the study of the distribution and behavior of the Utila Iguana. The Zoologische Gesellschaft Frankfurt and the Senckenbergische Naturforschende Gesellschaft Frankfurt have been the principal supporters of the project and enabled the original acquisition of property and construction of the Iguana Research and Breeding Station in 1998.

The Iguana Station continues to grow and improve. It now has a visitors' center with exhibits focusing on *C. bakeri,* but also addressing the other reptiles and amphibians of Utila. Spacious cages have been constructed on the grounds for rearing hatchling Swampers, along with cages for Green Iguanas (*Iguana iguana*) and Black Iguanas (*C. similis*), both species of which also are native to Utila. About 100 tourists visit the Station each month.

* Upon recommendations by the IIS, consideration is being given to holding hatchlings until two years of age, when chances for survival are greatly enhanced.

An adult male "Swamper" (*Ctenosaura bakeri*) at the Research Station. *Photograph by John Binns.*

Main building at the Iguana Research and Breeding Station. *Photograph by John Binns.*

Outdoor enclosures for head-starting iguanas. *Photograph by John Binns.*

In addition to maintaining the breeding and research program, volunteers from all over the world provide environmental education programs for the local schools. In cooperation with BICA (Bay Island Conservation Organization), the other NGO on Utila, all grades have been covered this year. The goal of this outreach program is to enhance the sensibility and feelings of responsibility of the children for their island home, with its phenomenally abundant natural treasures. Last but not least, the Iguana Station is working with the IIS and other organizations to acquire funding for the purchase of beach properties that serve as nesting sites for *C. bakeri* and which are, at the moment, the most critically threatened portions of their habitat (see related story on p. 28).

Organizations that have supported the Conservation Project Utila Iguana: the Senckenbergische Naturforschende Gesellschaft Frankfurt, the International Reptile Conservation Foundation, and the Zoologische Gesellschaft Frankfurt.

John Binns, representing the International Reptile Conservation Foundation (IRCF), installed about $2,500 in computer and network equipment in the lab at the Utila Iguana Research and Breeding Station. This replaced aged equipment and dramatically improved the Station's ability to communicate while also aiding in its research efforts.

David Nieves and Rick Morrow, representing the Kansas City Herpetological Society (KCHS), donated about $500 worth of equipment including two electronic scales (full-size for the lab and a miniature version for use in the field), a Gentle Giant Tong®, and a selection of tools including forceps, hemostats, dosing needles, and probes. All of these items were purchased from Midwest Tongs (www.tongs.com).

The Zen of Swamping — Adventures on Utila

AJ Gutman

What do you do when you're dripping with sweat and knee-deep in fetid swamp mud that threatens to yank the boots off your feet with every step? You scramble to capture another tiny Fiddler Crab to stuff in your cargo pockets (to feed to the young Utila Iguanas in the rearing cages at the Iguana Research and Breeding Station). Eyes alert for an endangered "Swamper" (as the endemic mangrove swamp-dwelling iguana, *Ctenosaura bakeri,* is known locally), you reach for the hand of a smiling friend as you climb onto a sturdy mangrove root, ready to lend a hand to the next person stuck in the mud. As muddy hands meet, you both burst into laughter, repeating "smacks of adventure!"

Perhaps not everyone would answer that question in quite the same manner, but all of the participants in the 2003 International Iguana Society conference on Utila definitely would. Seventeen IIS members and assorted other conservation aficionados from around the world spent a week together on Utila, a small island off the northern coast of Honduras. Much of that time was devoted to trekking through wet and muddy Swamper habitat.

Our hosts included personnel from the Station on the island and Dr. Gunther Köhler, Director of the Conservation Project Utila Iguana (CPUI), from Frankfurt, Germany. I first read about Dr. Köhler and his research and conservation work on

Only true iguana lovers (i.e., IIS members) could have this much fun on a stomp through the swamp. *Photograph by John Binns.*

Gunther Köhler (right), indulging his passion for country and western music, is joined by his wife, Elke (center), and AJ Gutman (left), performs the "Swamper Song" for conference participants. *Photograph by John Binns.*

behalf of the remarkable Swamp Iguana years ago in the *Iguana Times*. Eager to meet him and his wife Elke, I was entirely prepared to be dumbstruck with awe. What I didn't expect was a warm and wonderful couple with whom I would make my country and western singing debut performing Gunther's original rendition of the "Swamper Song."

The Station also proved to be delightful. Walking there from where we were staying, we would regularly encounter several Black Iguanas, *Ctenosaura similis,* that had taken up residence in hollow trees and on piles of rocks along the edges of Utila Town. The Station "greeter" was Rosalita, a charming Red-naped Amazon Parrot who loved to have her neck scratched. The tidy grounds were dotted with Hibiscus flowers and spacious enclosures filled with hatchling *C. bakeri,* as well as a few *C. similis* and *Iguana iguana* that are used in environmental education programs for Utilian school children. Among my personal favorite animals were the large Swamper male, who I named Willy Nelson because of his long dorsal spines, and a gorgeous female I called "Marlene." Marlene is an astonishing hybrid between *C. bakeri* and *C. similis*. Half of her tail, divided along the midline, has scalation characteristic of *C. bakeri* and the other half is characteristic of *C. similis*!

One of our field trips was by boat through a mangrove-covered canal where we were delighted by numerous Swamper sightings. Our final destination that day was a beach in an area called "Rock Harbor," where we cleared exotic invasive vegetation choking important egg-laying sites. What we didn't know while we were doing this work is that this area is one of the few remaining beach sites available for purchase. In cooperation with the CPUI and the International Reptile Conservation Foundation, the IIS is initiating a fundraising

A juvenile "Highlander" (*Ctenosaura similis*) on a rock wall. *Photograph by Robert Powell.*

Rosalita, a Red-naped Amazon Parrot, was the Station "greeter." *Photograph by Joe Burgess.*

A Swallowtail Butterfly visits a Hibiscus flower at the Station. *Photograph by Robert Powell.*

effort to help purchase and preserve this area for the Utila Iguana (details are given in the letter from the President on p. 59). This site also is part of the proposed Ecotrail, which will allow tourist access to critical iguana habitat for the economic benefit of the island while minimizing impact on the endemic species.

Another field trip to the Big Bight took us past an extremely unattractive garbage dump (Utila currently has no formal plan for waste disposal and the risk of contamination to groundwater is very real). Given the number of *Anolis* enthusiasts in our group, many people were eager to hunt for the endemic *Anolis utilensis* (a really swell anole found in the swamp; see the Species Profile on p. 36). Up to our knees yet again in water-inundated swamp, we happily climbed trees in pursuit of little lizards under the watchful and amused gaze of a Black Hawk.

Additional hikes, in which at least some of the conferees participated, went through prime Swamper habitat to Iron Bound on the northern coast, to the beaches below Pumpkin Hill, which were graced by colorful "Shaky Paws" (see the Species Profile), and, after a long boat trip around the western tip of the island, on an unsuccessful search for Don Quickset Pond, freshwater home to the few turtles known to occur on Utila. Although the pond remained elusive, hikers on that trip did manage to find a frog, one of five species known from the island but rarely seen except during the rainy season.

An educational sign near the harbor promoting Swamper conservation. *Photograph by John Binn.*

"Willie Nelson," an adult male Swamper at the Station. *Photograph by Robert Powell.*

"Marlene," a female hybrid *Ctenosaura bakeri* x *similis*. *Photograph by John Binns.*

After showering off the mud, we spent our evenings at the Bush Bar, a wonderful open-air pavilion, which the owner had graciously offered as a venue for our presentations. Conference participants, Iguana Station staff, and several Utilians were treated to talks on "Spiny-tailed Iguanas," "Aspects of the Ecology and Population Biology of *Ctenosaura bakeri*," "Lizard Ecology on West Indian Islands," "Lizard Wars" (invasive versus native reptiles in Florida), and "Modern Conservation Practices in the Caribbean."

The IIS thanks Gunther Köhler, Sven Zörner, Alexander Gutsche, Karsten Gees, and the volunteer staff of the Iguana Research and Breeding Station for making our Conference an unforgettable experience. Special thanks also to the thoroughly wonderful Sandy Binns for making all of our impossible travel arrangements. We never could have done it without you!

Bob Powell, Sandy Echternacht, Alex Lau, Wendy Townsend, Mark Keoppen, and an unnamed boat driver (from front to back) heading for and through the canal to Rock Harbor. *Photographs by Joe Burgess.*

Gunther Köhler addressing the conference. *Photograph by Alex Lau.*

A Common Black Hawk (*Buteogallus anthracinus*) supervising our *Anolis* hunt in the Big Bight. *Photograph by Robert Powell.*

AJ Gutman, Joe Wasilewski, and Betsy Davis engage in some hands-on conservation by clearing invasive vines that are choking an important nesting site near Rock Harbor. *Photograph by John Binns.*

The only frog (*Leptodactylus melanotus*) seen on the trip. *Photograph by Joe Burgess.*