JOHN BINNS

The big wildlife attraction on Guana is the Stout Iguana (*Cyclura pinguis*).

The Herpetofauna of Guana Island: An Annotated Checklist and Travelogue

Gad Perry[1] and Robert Powell[2]

[1]Department of Natural Resource Management, Texas Tech University, Lubbock, Texas 79409, USA
Department of Biology, Avila University, Kansas City, Missouri 64145, USA

Guana Island is a remarkable place. A high-end working hotel much of the year (www.guana.com), this privately-owned island in the British Virgin Islands (BVI) is also an informal wildlife sanctuary. Each year in October, it serves as the home base for scientists studying everything from plants to bats. During "science month," Guana is the headquarters for scientific work that extends well beyond the island's shores. What allows all of this to happen is the generosity of the owners, who have supported the research for many years and are committed to the continued protection of the island and its remarkably diverse plant and animal life. Biological work on Guana was initiated in 1980 by Dr. James ("Skip") Lazell, and remains under his direction today. Herpetology is a major focal point of the work, but the scope is extensive and includes studies of soils and topography, plants and fungi, invertebrates, and all vertebrate groups. Disciplines represented have been heavily ecological and conservation-oriented, but also include archeology, ethology, physiology, remote sampling, and a broad range of systematic studies.

We have been fortunate to conduct work on this unique island for some years now, and to observe the work of many others. In the realm of herpetology, this includes basic inventories, descriptions of new species, and detailed studies of ecology, ecophysiology, and ethology. Conservation, including the restoration of the highly endangered

GOOGLE EARTH

Despite its relatively small size, Guana is a polyglot of varied elevations and habitats.

GAD PERRY

The dry tropical forest of Guana is home to several cacti, as well as trees and shrubs. The white stains on the rocks are guano from sea birds.

JOHN BINNS

Although ghuts (draws or arroyos) may be relatively humid, many of Guana's slopes and ridges are quite dry and are characterized by succulents and other xeric-adapted species.

JOHN BINNS

With the hotel restricted to a small area along a single ridge and other visitor-frequented areas largely limited to the beach and nearby recreational areas (tennis, croquet, etc.), the vast majority of Guana serves as a nature reserve. Tortola is visible in the distance.

Stout Iguana (*Cyclura pinguis*), is a major focus as well. Finally, the scientists involved engage in varied educational efforts for groups ranging from the younger members of the owners' family, through school-aged local kids, to students from the local community college and from Texas Tech University. In this article, we present a travelogue, focusing on the island as a destination, discuss herpetologically oriented educational activities, and present an annotated checklist of its amphibian and reptilian species.

ROBERT POWELL

A small flock of Greater Flamingos graces the mangrove-bordered salt pond on Guana.

An Introduction to Guana Island

Purchased by the current owners in the 1970s, only a tiny portion of Guana is in any way developed. Most of the island is covered by tropical dry forest, a vegetation type that is more endangered but less often discussed than tropical rain forest. Also present are sandy and rocky beaches, a small patch of mangroves, and two types of ghut (the local name for arroyo) vegetation, one of which includes larger trees whereas the other contains a large number of native palms. Signs of the 18th-century Quaker habitation remain, primarily in the form of overgrown ruins readily exploited by today's reptiles; however, the Quakers engaged in very little cultivation and much of the island was untouched. Few Caribbean islands have been so effectively protected for so long. As a result, wildlife of all kinds abounds.

For paying guests, the small hotel offers a high-end experience focused on simplicity and nature. The rooms do not have air conditioning, large TVs blaring CNN, or constantly ringing phones. The number of guests is kept small, and no disco or casino disturbs the natural ambiance. On the other hand, the rooms are tasteful, the beds are very comfortable, the service is great, and the food is wonderful. Walking trails cover the island. The package that guests receive when they arrive includes a backpack, a diving mask, and a snorkel. They fall asleep to the sounds of the wind, the sea, and calling frogs. They

ROBERT POWELL

The ruins of an 18th-century Quaker sugar mill grace the shore of the salt pond.

wake up refreshed, and if they can't remember what day of the week it is, so what?

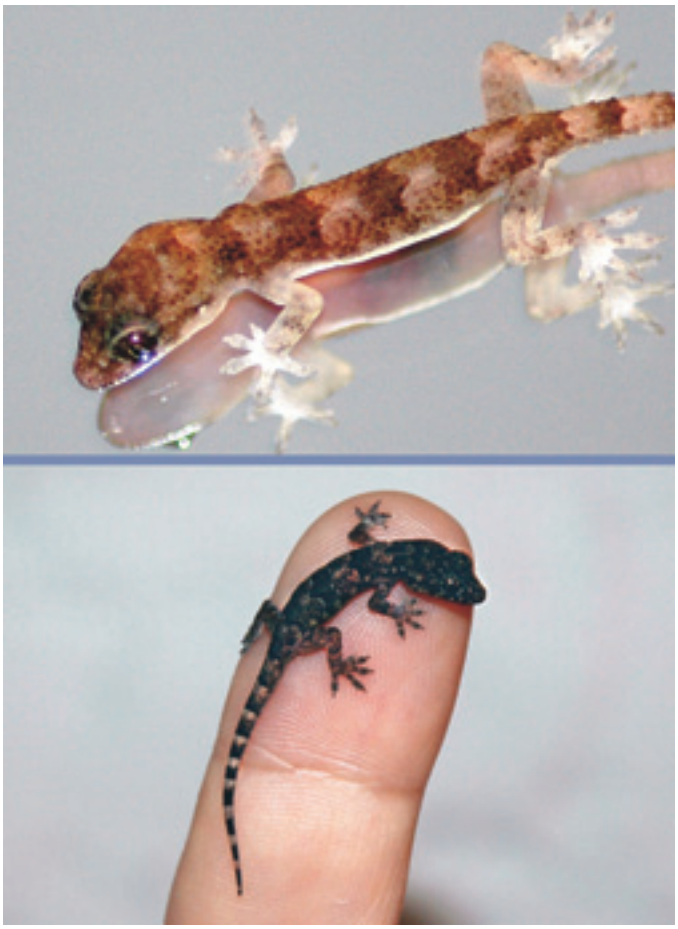
The Amphibians and Reptiles of Guana Island

Only one species of frog resides on Guana, the Puerto Rican Rainfrog, *Eleutherodactylus antillensis*. It is small, active mostly at night, and likes humidity. The call sounds like "chew-weep, chew-weep," but males also have a clicking call that they use to warn competitors away. A single Cuban Treefrog (*Osteopilus septentrionalis*) — an invasive species that is rapidly spreading in the region — has been captured on the island, but the owners have been quite aggressive in checking arriving plants and construction materials to make sure that this indiscriminant predator does not become established. No other Cuban Treefrogs have been seen, even as the species continues to spread, affecting native frogs and lizards on other islands in the area.

The waters around Guana are a good place to look for, and often find, sea turtles, especially the endangered Hawksbill (*Eretmochelys imbricata*). Few nesting attempts have been documented on the island, but several other sea turtle species can be found in the waters of the BVI, including gigantic Leatherbacks (*Dermochelys coriacea*), locally known as "trunk." The origin of the Red-footed Tortoise (*Chelonoidis carbonaria*) is still being debated. They may have dispersed to this area naturally, or they may have been introduced by early human settlers. Either way, the species had been eradicated from many of the islands in the region, but was restored to Guana through the work of Skip Lazell. Finding the tortoises is quite difficult; despite their relatively large size and colorful legs, they blend remarkably well with the dappled shade of the forest.

Another elusive resident is the Virgin Islands Worm Lizard (*Amphisbaena fenestrata*). When Lazell first came to the island, old-timers told him about an "earthworm with teeth." This eventually turned out to be a blind, burrowing lizard that does indeed resemble an earthworm. Like most other subterranean reptiles and amphibians, little is known about the biology of this species. They emerge after heavy rains, can be seen under rocks at some elevations at other times, and have very little resistance to water loss — but little else is known about them.

Two species of geckos occur on Guana. Puerto Rican Dwarf Geckos (*Sphaerodactylus macrolepis*) can be seen scurrying wherever leaf-litter and shade are abundant. Unlike most geckos, they are active during the day, on the ground, and lay a single egg instead of the customary two. Very small, these colorful creatures must protect themselves from excessive water loss and are most often seen during wet periods. Remarkable, despite their tiny weight — an individual weighing half a gram is a giant among sphaeros — the numbers of these lizards can be so high that their combined biomass exceeds that of wild game in the African savannah! Indeed, the Guana population was described as the world's densest terrestrial vertebrate a few years ago, with numbers in optimal habitat about 67,600 per hectare. The other species is the Cosmopolitan House Gecko (*Hemidactylus*



ROBERT POWELL

Cosmopolitan House Geckos (*Hemidactylus mabouia*) readily coexist with humans. These juveniles shared a room with one of the scientists, exploring the bathroom mirror at night.

mabouia), which resembles many other members of the genus in being nocturnal, climbing, and closely associated with humans. House Geckos are uncommon in the forest but can often be seen darting after insects on buildings at night. Most likely the species was introduced here hundreds of years ago, but the exact time of arrival has not been established. The larger South American Turnip-tailed Gecko (*Thecadactylus rapicauda*) has never been seen on Guana, despite being common on some of the Virgin Islands.

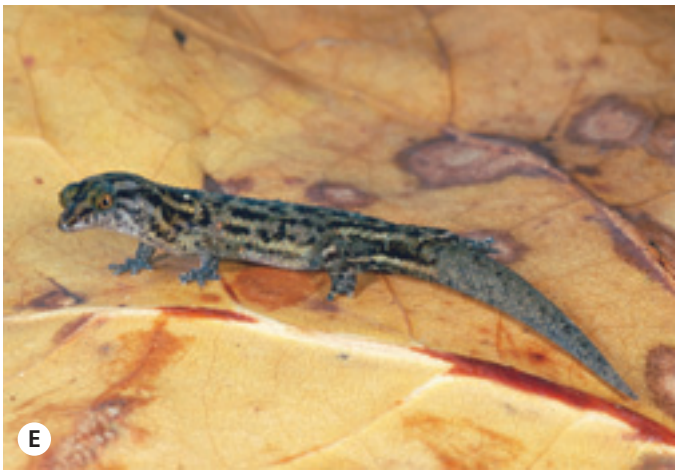
The three anoles found on Guana are all abundant. The Crested Anole (*Anolis cristatellus*) has been the most studied, with efforts

ROBERT POWELL

GAD PERRY

GAD PERRY

GAD PERRY



ROBERT POWELL

GAD PERRY

A: Locally known as the "Bo-peep" Frog, *Eleutherodactylus antillensis* is the only amphibian species on Guana. **B:** The team that inspected a barge full of ornamental plants bound for Guana to ensure that no Cuban Treefrogs hitched a ride. **C:** A young Red-footed Tortoise (*Chelonoidis carbonaria*) faces the world. Although historically present, tortoises had to be reintroduced onto Guana after disappearing for unknown reasons. **D:** An amphisbaenian (*Amphisbaena fenestrata*) making a rare aboveground appearance. **E:** Diminutive Dwarf Geckos (*Sphaerodactylus macrolepis*) may have the greatest population density of any vertebrate in the moist Sea Grape leaf litter near the beaches on Guana. **F:** A shiny Slipperyback (*Mabuya sloanii*). These skinks are not uncommon, but are rarely captured because of the alacrity with which they hide in dense (often spiny) vegetation or rock crevices.

focusing on abundance, territorial size, foraging behavior, diet, movement patterns, water loss, and more. The species is common and apparent in many areas, including the hotel itself. Males of this species are territorial, displaying often and occasionally engaging in fights that can last for over 30 minutes and involve much posturing, biting, and even knocking rivals off trees. Feeding primarily on invertebrates, Crested Anoles occasionally take small fruits. Anoles, in turn, are eaten by a number of the island's residents, including birds (Kestrels, two species of cuckoos, Pearly-eyed Thrashers) and snakes. The smaller Saddled Anole (*A. stratulus*) is equally abundant in many

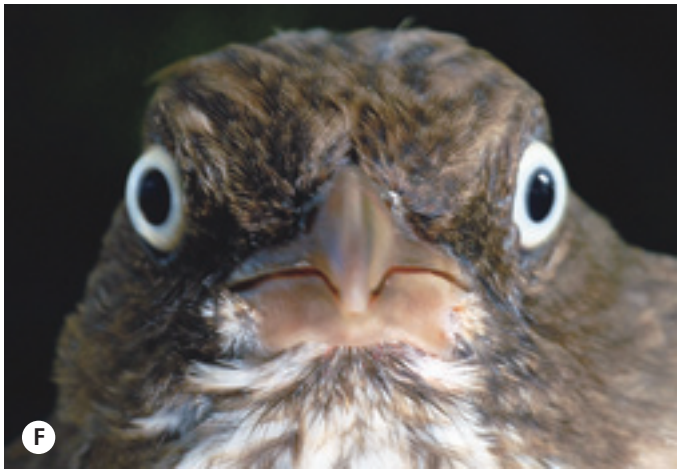
GAD PERRY

GAD PERRY

ROBERT POWELL

ROBERT POWELL

GAD PERRY



ROBERT POWELL

A & **B:** Crested Anoles (*Anolis cristatellus*) happily coexist with humans. An adult male uses an old cannon as a display site and a female forages at a nightlight during the dark hours. This tolerance of humans may explain the success with which this species has invaded several areas far beyond the Puerto Rico Bank. **C:** Adult male Puerto Rican Ground Lizards (*Ameiva exsul*) are encountered in patches of sunlight throughout the island. **D:** Ground lizards are sunlovers and like it hot. When foraging in forested areas, they frequently pause in patches of sunlight to bask. **E:** No one had observed a ground lizard swimming before this photograph was taken of a young animal that jumped off a barge when chased, then swam back to safety. **F:** Aptly named Pearly-eyed Thrashers are aggressive predators of small lizards, birds, and insects, but also eat fruits.

places. Saddled Anoles often seem fearless, allowing people to approach very closely. On Puerto Rico, they often range very high into the crowns of trees, but on Guana, where trees are shorter, they are usually encountered at face level and even on the ground. The third anole on the island, the Puerto Rican Grass Anole (*A. pulchellus*) is both the most attractive and the hardest to see. Its elongated

A: Lynford Cooper, Gad Perry, and James "Skip" Lazell (from left to right) insert an electronic tag in the tail of an adult Stout Iguana (*Cyclura pinguis*). **B:** Hatchling Stout Iguanas (*Cyclura pinguis*) are frequently seen on Guana during the hatching season in September and October. Hatchlings are captured, measured, injected with an electronic marker, numbered (this is No. 19), and released in order to gather data on growth, survival, and movements. **C:** Little is known about the biology of the burrowing blindsnake *Typhlops richardii*. Note the spiked tail tip, which is used as an anchor when burrowing and with which the snake will try to establish traction when handled. **D:** The Puerto Rican Groundsnake (*Arrhyton exiguum*), sometimes called the "Small Racer," is most frequently encountered on Guana after dark, but other populations are known to be active by day. **E:** Some but not all Puerto Rican Racers (*Alsophis portoricensis*) respond to threats with a cobra-like display. **F:** Although apparently rare, cannibalism does occur in the Puerto Rican Racer. Here, the larger snake died after ingesting the smaller one.

form merges imperceptibly with the narrow stems on which it lives. Like other members of the genus, however, males have well-established territories that are fiercely defended from other males.

Three more species complete the lizard list. First is a skink known locally as the Slipperyback (*Mabuya sloanii*). Like many other skinks, its scales are smooth and shiny. This species is most often found in shady, rocky areas. They quickly scurry into the vegetation or a crevice, and little is known about their biology. Some evidence suggests that what appears to be a single species in the BVI is actually comprised of several similar, but genetically distinct forms. The Carrot Rock population was described as a separate species some years ago, and analyses of other populations are ongoing. The Puerto Rican Ground Lizard (*Ameiva exsul*) is very conspicuous on sunny days — striped juveniles roam the ground, pushing their pointy snouts into leaf litter or crevices in search of insects to eat, while the more colorful and much larger males search for bigger prey and females. A few years ago, we documented, for the first time, that these lizards can and will choose to swim; we observed several individuals leap off a barge into the sea to avoid capture, swim like Marine Iguanas, then climb back onto the boat.

The big attraction among lizards is, of course, the Stout Iguana (*Cyclura pinguis*). One of the most endangered species in the world, even the most optimistic population estimates do not exceed 500 individuals. Half that number may be more realistic, and about half of them live on Guana. At one point, these iguanas were found throughout the greater Puerto Rico Bank (Puerto Rico proper, its satellite islands, and the U.S. and British Virgin Islands with the exception of St. Croix). Although even the experts disagree about the cause — some suggest that predation by humans and introduced predators is primarily responsible, whereas others implicate climatic changes — by the time 20th-century biologists arrived on the scene, the only iguanas still living were all on Anegada in the BVI. By the 1970s, their situation was becoming grim due to human persecution, predation by introduced cats, and competition from introduced ungulates. Hunters seeking food had long since extirpated flamingoes from Anegada, so, in the early 1980s, Dr. Lazell engineered a swap. In exchange for flamingoes, donated by the owners of Guana, eight iguanas were brought to Guana from Anegada. These began reproducing, and the Guana population has in the meantime both grown and become the seed for reestablishing the species on additional islands. Whenever it is sunny, iguanas are a common sight on Guana Island trails — especially after the juveniles emerge in September and October. Happily, the iguanas have been reintegrated into the local ecosystem and are eaten by both snakes and birds of prey.

Three snake species occur on Guana, but two of them are rarely encountered. One (*Typhlops richardii*) is a blind snake. Although quite common, it is rarely seen above ground, and its ecology is poorly understood. Another, the Small Racer (*Arrhyton exiguum*), is uncommon and secretive. On Guana, it is frequently seen at night, but the very small sample size — we normally see only one or two during our study season — means that we know relatively little about them. At the Sage Mountain Reserve on nearby Tortola, the highest

GAD PERRY

Dr. Barry Valentine, entomologist par-excellence, studying the day's catch. Above is part of his seasonal booty.

GAD PERRY

Dr. Kate LeVering holding the largest Racer ever caught on Guana. The kind of tail damage (inset) is common, but its cause remains unclear.

ROBERT POWELL

Male Saddled Anoles (*Anolis stratulus*) are fiercely territorial. Their dewlap displays add a splash of bright color to the dry forests of Guana.

ROBERT POWELL

Slender Puerto Rican Grass Anoles (*Anolis pulchellus*) often are hard to see among blades of grass.

and wettest spot in the Virgin Islands, this species is much more common and active during the day, suggesting that high rates of water loss may be a limiting factor on Guana.

The Puerto Rican Racer (*Alsophis portoricensis*) is abundant on Guana. On many islands in the region, the introduction of cats and especially mongooses has decimated the populations of ground-dwelling snakes and lizards, but Guana has no mongooses. Consequently, anyone walking the trails of Guana with their eyes open is virtually guaranteed to encounter at least one of these animals. In the last few years, we have been part of a project that individually marked and measured some 500 individual animals, and we are a long way from having a complete inventory — low rates of recapture suggest that the population is in the thousands. These snakes are active throughout the day and seem to exploit every available habitat on Guana. Because of the high densities and intensive effort, we have been able to document previously unobserved behaviors such as swimming, cannibalism, and feeding on baby iguanas. We have noted that some individuals will flatten their necks in a cobra-like display when threatened, although we do not yet know how this helps the animals or why only some snakes do it. We also noted that virtually all adults are missing the tips of their tails, but are not yet sure what is responsible.

ROBERT POWELL

Adult Puerto Rican Ground Lizards (*Ameiva exsul*) have powerful jaws and can inflict a painful bite.

One final snake closes this list, the Virgin Islands Boa (*Epicrates monensis*). This endangered snake was reported from Guana many decades ago, but has not been seen since then despite repeated searches. Suitable habitat appears to be present, and we do not know if we simply have not yet found this nocturnal snake, whether the original record was erroneous, or if the species was once present on Guana but has since disappeared for an unknown reason. That the species is relatively common on nearby Tortola gives us hope that it may yet be found on Guana.

ROBERT POWELL

Two male Crested Anoles (*Anolis cristatellus*) fighting over a territory centered on a date palm. This battle lasted over 30 minutes and ended with the slightly larger invader displacing the former resident.

ROBERT POWELL

Puerto Rican Racers (*Alsophis portoricensis*) appear to exploit every habitat on Guana, including the hotel grounds — which illustrates the ability of humans and snakes to coexist when the latter are not persecuted.

Herpetological Education on Guana Island

Research is important, but disseminating knowledge is just as crucial. One part of that mission is accomplished by articles such as this and by more technical publications in other journals. Another part, however, is educating people face-to-face. Over the years, participants in the Guana Island science month have done this in many ways. For the general public, scientists present their work on Guana and elsewhere at an annual symposium held at the H. Lavity Stoutt Community College on Tortola. This event attracts residents from throughout the BVI. Several local groups, ranging from boy scouts to college students, come to Guana each year and interact with the scientists. The hope is that a better-educated public is more inclined to support conservation action throughout the BVI, most of which remains poorly protected.

Another important educational effort centers on US-based students. Over the years, both undergraduates and graduate students have come to Guana. Undergraduate classes are typically diverse, combining lectures with hands-on experiences. Graduate classes are research-oriented, teaching not only about tropical ecology and conservation but also how to conduct group research and get it published in the peer-reviewed literature. Herpetological projects have focused on anoles, ground lizards, and dwarf geckos. In addition, individual students have been involved in projects on racers, iguanas, and Crested Anoles, and some of those studies have led to published articles.

The final group with which we work on a regular basis includes the children and grandchildren of the island's owners. As they will make the decisions about the management of the island in the future, we want them to learn to love it and its inhabitants. In 2008, we spent close to a week teaching them about herpetology, with Jennifer

ROBERT POWELL

The recent discovery of the Virgin Islands Boa (*Epicrates monensis*) on a nearby island lends credence to reports of the species on Guana, where it has not been seen since an unverified report many decades ago.

GAD PERRY

Joydeep Bhattacharjee talks about invasive Saltcedar trees at the annual symposium held at the H. Lavity Stoutt Community College on Tortola.

ROBERT POWELL

Dr. Matt Gifford talks to Pathfinders from Tortola about Guana's ground lizards.

JENNIFER OWEN

The children meet a hatchling Stout Iguana marked #6.

Owen leading the program. The "boxes" on the facing page present some of their comments in their own words.

Acknowledgements

We are indebted to the owners of Guana Island for allowing us repeated access to this unique place. Support for this project was provided by The Conservation Agency through a grant from the Falconwood Foundation, and by Texas Tech University. The Guana Island staff deserves special thanks not only for putting up with the strange requests of scientists all these years, but also for getting into the spirit of things and helping with the work. This is manuscript T-9-1160 of the College of Agricultural Sciences and Natural Resource Management, Texas Tech University.

JENNIFER OWEN

Mckenzie Jarecki gets to know a Puerto Rican Racer (*Alsophis portoricensis*).

References

The following reflect many of the studies conducted on Guana Island during "Science Month."

Barun, A. and G. Perry. 2003. *Amphisbaena fenestrata* (Virgin Islands Amphisbaena). Predation. *Herpetological Review* 34:244.

Barun, A., G. Perry, R.W. Henderson, and R. Powell. 2007. *Alsophis portoricensis anegadae* (Squamata: Colubridae): Morphometric characteristics, activity patterns, and habitat use. *Copeia* 2007:93–100.

Dmi'el, R., G. Perry, and J. Lazell. 1997. Evaporative water loss in nine insular lizard populations of the *Anolis cristatellus* group in the British Virgin Islands. *Biotropica* 29:111–116.

Lazell, J. 1991. The herpetofauna of Guana Island: Diversity, abundance, rarity, and conservation, pp. 28–33. In: J.A. Moreno (ed.), *Status y Distribución de los Reptiles y Anfibios de la Región de Puerto Rico.* Publicación Científica Miscelánea No. 1. Departamento de Recursos Naturales de Puerto Rico, San Juan.

Lazell, J. 1997. The Stout Iguana of the British Virgin Islands. *Iguana Times* (*Journal of the International Iguana Society*) 6:75–80.

Lazell, J. 2002. Restoring vertebrate animals in the British Virgin Islands. *Ecological Restoration* 20:179–185.

Emily Chandler – age 8

This year on Guana Island, we worked with herpetologists to find out more on reptiles and amphibians. At first we all sat down and briefly discussed the different categories of animals in the world. Then we talked about the way scientists classify animals and played a few games to teach us which animals go in which categories. We each designed our own pretend reptile on paper and shared it with everyone before we started learning about real reptiles. The biggest category of reptiles on Guana is snakes and lizards. We learned how to make our own nooses and went out catching lizards, such as anoles. Then we learned how to mark, measure, weigh, and inject a tag into the animal to help track its information in the future because we hope to catch it again. Then the scientists wrote down all their information, called data, in a book. If they catch the same animal again, they can learn about how much it has grown, how much it has eaten, if any predators have gotten to it, and how far it moved.

We divided into groups to study different animals. My group studied the Bo-Peep Frog (*Eleutherodactylus antillensis*). I got my information by interviewing a scientist who studies these frogs. I asked her where it lives, what the scientific name is, what it eats, what its predators are, what calls it makes, what it looks like, what it is attracted to, how long it lives, and what places it might be found in. She answered all these questions for me and from that we made a PowerPoint presentation of the information.

James Chandler – age 9

On Guana Island this year, we studied herpetology, which is the study of reptiles and amphibians. The scientists introduced us to all of the different classes of animals, and we reviewed how animals are classified, which we had learned the year before. Then we started to zero in on reptiles and amphibians. We studied the different groups of reptiles first, which are turtles & tortoises, crocodilians, snakes & lizards, and the last living species, called the Tuatara, from an extinct group.

While we were doing this, the scientist split us into groups for our separate projects to come later. Mine was the Rock Iguana (*Cyclura pinguis*).

Some of the things we learned were how to tag and mark lizards and snakes and how they are tracked with radio transmitters. We were also lucky enough to watch the life and (natural) death of a snake and all the things scientists do to it, such as marking, weighing, measuring, recording the information, and setting it free in hopes of capturing it again later. In the case of the one that died, we were able to watch it being preserved and prepared for shipment to a museum. We discussed the idea of scientific ethics and trying not to hurt animals.

Then we got to work on our own projects. My group got our information by interviewing the scientists who study the Rock Iguana in real life. The Rock Iguana is endangered and is only found in the Caribbean. There are about 300 left on Guana Island, about 150 on Anegada, and about 100 on Necker Island. We learned about its habitat, what it eats, and what eats it (predators). Together we made a PowerPoint presentation explaining our information.

Diana Chandler – age 12

This year over the course of five days, I worked on a project with a herpetologist and our main topic was male Crested Anoles. We studied the size of the anole's territory by looking at their movement patterns. To get the data, we learned to catch the anoles with nooses and mark them with nail polish on the back so they could be identified when we caught them again. We then took measurements of the tail, body, and head, weighed them, and recorded all our information. Then, we had to put them back right where we found them so that we could see how far they had moved when we (hopefully) caught them again. We caught approximately 30 anoles, including recaptures, in all. The conclusion that we drew was that male Crested Anoles can expand their territory in one day up to 40 feet, though sometimes their territory remains a single tree. Also, even the ones that traveled tended to prefer remaining in trees.

Lazell, J. 2005. *Island: Fact and Theory in Nature.* University of California Press, Berkeley and Los Angeles.

Lazell, J. and G. Perry. 1997. *Anolis cristatellus wileyae* (Virgin Islands Crested Anole). Frugivory. *Herpetological Review* 28:150.

LeVering, K. and G. Perry. 2003. *Cyclura pinguis* (Stout Iguana, Anegada Rock Iguana). Juvenile predation. *Herpetological Review* 34:367–368.

Nicholson, K.L., S.M. Torrence, D.M. Ghioca, J. Bhattacharjee, A.E. Andrei, J. Owen, N.J.A. Radke, and G. Perry. 2005. The influence of temperature and humidity on activity patterns of the lizards *Anolis stratulus* and *Ameiva exsul* in the British Virgin Islands. *Caribbean Journal of Science* 41:870–873.

Owen, J. and G. Perry. 2005. *Anolis cristatellus wileyae* (Virgin Islands Crested Anole). Saurophagy. *Herpetological Review* 36:444.

Owen, J., G. Perry, J. Lazell, C. Petrovic, and J. Egelhoff. 2006. *Osteopilus septentrionalis* (Cuban Tree Frog). Colonization of the British Virgin Islands. *Herpetological Review* 37:74–75.

Perry, G., R. Dmi'el, and J. Lazell. 1999. Evaporative water loss in insular populations of the *Anolis cristatellus* group (Reptilia: Sauria) in the British Virgin Islands II: The effects of drought. *Biotropica* 31:337–343.

Perry, G., R. Dmi'el and J. Lazell. 2000. Evaporative water loss in insular populations of *Anolis cristatellus* (Reptilia: Sauria) in the British Virgin Islands III: A common garden experiment. *Biotropica* 32:722–728.

Perry, G., R. Dmi'el, and J. Lazell. 2004. *Amphisbaena fenestrata* (Virgin Islands Worm Lizard). Evaporative water loss. *Herpetological Review* 35:165–166.

Perry, G. and G.P. Gerber. 2006. Conservation of amphibians and reptiles in the British Virgin Islands: Status and patterns. *Applied Herpetology* 3:237–256.

Perry, G. and J. Lazell. 1997. *Anolis stratulus* (Saddled Anole). Nectivory. *Herpetological Review* 28:150–151.

Perry, G. and J. Lazell. 2000. *Liophis portoricensis anegadae.* Night-light niche. *Herpetological Review* 31:247.

Perry, G. and J. Lazell. 2006. *Anolis pulchellus* (Grass Anole). Nectivory. *Herpetological Review* 37:218–218.

Perry, G., J. Lazell, K. LeVering, and N. Mitchell. 2007. Body size and timing of reproduction in the highly endangered Stout Iguana, *Cyclura pinguis*, in the British Virgin Islands. *Caribbean Journal of Science* 43:155–159.

Perry, G., K. LeVering, A. Barun, and J. Lazell. 2007. *Alsophis portoricensis anegadae.* Scavenging. *Herpetological Review* 38:203.

Perry, G., K. LeVering, I. Girard, and T. Garland, Jr. 2004. Locomotor performance and social dominance in male *Anolis cristatellus. Animal Behaviour* 67:37–47.

Perry, G., K. LeVering, and N. Mitchell. 2003. *Cyclura pinguis* (Stout Iguana, Anegada Rock Iguana). Juvenile agonistic behaviors. *Herpetological Review* 34:367.

Perry, G. and R. Powell. 2008. *Alsophis portoricensis anegadae* (Racer). Cannibalism. *Herpetological Review* 39:465.

Perry, G., R. Powell, and H. Watson. 2006. Keeping invasive species off Guana Island, British Virgin Islands. *Iguana* 13:272–277.

Powell, R. 2006. Lizard warfare. *Iguana* 13:22–23.

Powell, R., G. Perry, R.W. Henderson, and A. Barun. 2006. *Alsophis portoricensis anegadae.* Aquatic activity. *Herpetological Review* 37:228–229.

Rodda, G.H., G. Perry, R.J. Rondeau, and J. Lazell. 2001. The densest terrestrial vertebrate. *Journal of Tropical Ecology* 17:331–338.

IRCF

REPTILES & AMPHIBIANS

CONSERVATION AND NATURAL HISTORY

VOL 16 NUM 1 MAR 2009