

# The St. Lucian Green Iguana — A Special Case?

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*"I'm optimistic that the St. Lucian Iguana will be saved, and that we will be able to protect them in such a way that they will be able to expand into new areas. My dream is to see the iguana repopulate a much wider area of the island..."*

— Donald Anthony,  
Wildlife Officer, St. Lucia

**S**t. Lucia is one of the Windward Isles in the Lesser Antillean chain, which extends from just southeast of the Puerto Rico Bank almost to South America. With an area of 610 km<sup>2</sup>, the island is topographically and biotically

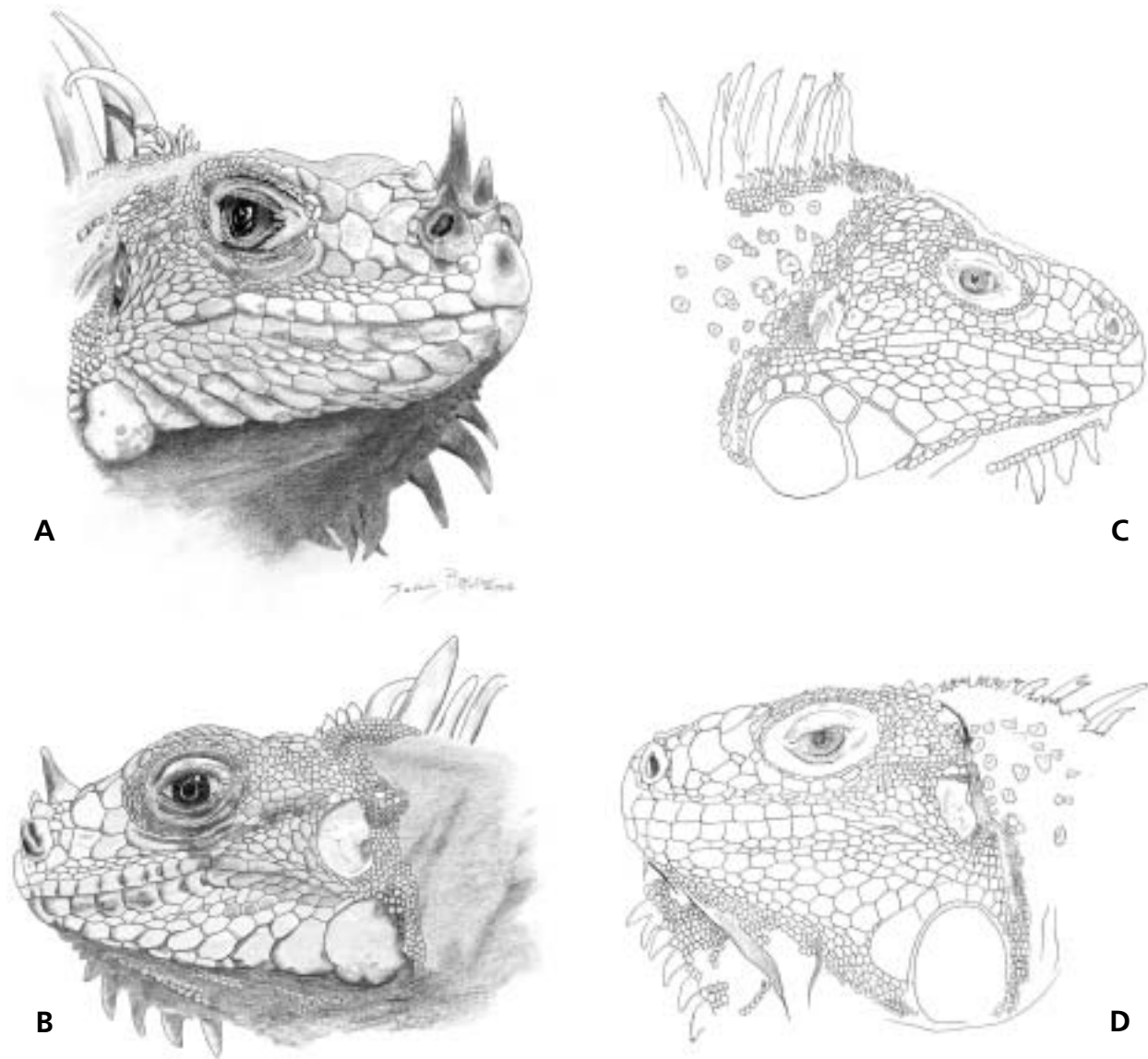
diverse. Montane uplands are covered by rainforest, whereas coastal areas are characterized by dry woodlands. Human influence is evident in the abundant agricultural areas and numerous communities.

Green Iguanas (*Iguana iguana*) are widely distributed through Central and much of South America, and have been introduced and become established in many tropical and subtropical areas throughout the world. St. Lucia is the northernmost of the Antilles on which these animals occur naturally.

Introduced Green Iguanas are all too common and indeed, have become pests in parts of Florida (see Newsbriefs, p. 94). On some of the more



Large adult male St. Lucian Green Iguana. Note the pale ground color and the length of the dorsal crest scales.



An adult male St. Lucian Green Iguana (a) and a young adult female St. Lucian Green Iguana (b) compared to male (c) and female (d) Green Iguanas from elsewhere in the species' range. Note the horns and differing shapes of scales on the jaws. Drawings by the author.

northerly isles of the Lesser Antilles, they pose a threat to populations of their endangered relative, *Iguana delicatissima*, through competition for food and habitat and by reproducing at a higher rate. In some areas, they also have threatened the integrity of the unique *I. delicatissima* gene pool by hybridizing with the native animals.

Unlike the introduced populations, which have become established only in recent years, St. Lucian Iguanas may have been isolated from other Green Iguana populations for as long as hundreds of thousands of years — and consequently appear

to be a bit different. Most obviously, St. Lucian Iguanas have “horns,” dramatically enlarged scales that project conspicuously from their snouts. These vary considerably in size and seem to be more prominent in older animals. Although relatively rigid and firm (much more so than the mid-dorsal crest spines, for example), they do “bend” from side to side. They also are thicker in diameter than dorsal crest scales, although, in cross-section, they are somewhat flattened laterally. The coloration and shape of some large scales on the lower jaw also differ from those of other Green

Iguanas. Catherine Malone, Purdue University, has examined the DNA of many iguanids, and recently has been concentrating on St. Lucian Iguanas. Her work is yet to be published, but preliminary results show distinct genetic differences between St. Lucian and other Green Iguana populations.

Although based on a relatively small sample of a few dozen adults and recognizing considerable variation among individuals, St. Lucian Iguanas appear to undergo ontogenetic changes in color and pattern. Hatchlings are bright or yellowish green with cloudy gray or black bands. These bands seem to fade in the first year or two of life, when the iguanas are a very intense green. As the animals continue to age, the green (usually) loses its intensity and the bands appear to darken. In the oldest (or, at least, the largest) individuals, the green fades to a pale gray and the black bands are quite prominent.

Until recently, no research has been conducted on these iguanas. Now, with support from the Durrell Wildlife Conservation Trust, Matthew Morton of Bristol, England and local assistants are implementing a project in cooperation with the



Over 1000 hatchlings were observed on the main nesting beach this year, but survival rate is very low due to predators.

Forestry Department (part of the Ministry of Agriculture) of the St. Lucian government. The Forestry Department has provided field assistance and technical expertise, as well as vehicles and office facilities. Head of Department Brian James and Deputy Michael Andrews have taken a keen interest, and Donald Anthony and Alwin Dornelly from the Department's Wildlife section are working closely with Morton. Karen Graham of the Sedgwick County Zoo (Kansas), Bill Toone of the San Diego Zoo, and Catherine Malone also have contributed greatly by assisting with the Union Zoo's (St. Lucia) exhibit, education and community outreach planning, and blood sampling from wild and captive iguanas for DNA analysis. Labor and travel expenses for Graham and Toone were covered by their respective institutions, and Malone received funding through the International Iguana Foundation and the Miami Metro Zoo to cover material costs for improvements to the zoo exhibit and educational posters.

The goals of the project are to: (1) determine the population size and distribution of St. Lucian Iguanas, (2) establish the population's taxonomic status, and (3) protect and conserve current populations.

Blood is drawn for DNA analysis and PIT tags (transponders) are inserted in each individual. The latter can be read using a type of barcode reader, and a unique number permanently identifies the animal, even if the tag turns up in the belly of a predator. Some iguanas have been equipped with transmitters and radiotracked.



A female iguana in the Limiere area.



An adult male St. Lucian Green Iguana that was recaptured on several occasions.

The largest St. Lucian Iguana processed to date weighed over 5 kg and had a snout-vent length of 45 cm. Current estimates of adult population size range in the hundreds, certainly less than 1000. Over 1000 hatchlings have been

observed on the main nesting beach, but very few of that number survive to maturity.

St. Lucian Iguanas are restricted to the north-eastern part of the island, including the beaches. Several unsubstantiated reports also place at least a few animals in the southeast. Sightings or recent reports of iguanas are absent for the entire interior of the island (moist forest) and the entire western coast. The small number of older reports that are available are difficult to interpret. At least some of these areas should be suitable for iguanas, so why aren't they there? Any number of factors might be responsible.

*"Dogs kill adult iguanas, either in hunts with people (a few people still eat them for food) or, more commonly, it seems, because they are allowed to run around unattended, killing whatever they can. Hunting (by people) was reportedly more common in the past, and many local people attribute perceived declines in iguana numbers at one site in particular to*



Illustration by John Binns.



The International Iguana Foundation and the Durrell Wildlife Conservation Trust have funded signs asking people to keep dogs on leashes in the main areas occupied by iguanas.

*"Roots Farm is a cooperative farm, run by Rastas in one of the areas on St. Lucia where iguanas are still found. They practice organic farming and grow a wide range of mixed crops, in contrast, for example, to monocultures of bananas, which are commonplace in many areas. What drew our attention to this place is that, unlike most places on the island, this was one where you had a fairly good chance of seeing an iguana. And that's because of the Rastas' gentle and sympathetic attitude toward iguanas and all wildlife. Hunting and unleashed dogs are not tolerated on their land."*

— Matt Morton

*"I think, in this culture people, not knowing too much about wildlife, do not have an understanding of their importance and, as a result, do not appreciate those animals as people who are wildlife-sensitive do. We've had, in the past, to do extensive work in terms of education with the St. Lucia Parrot, and we can*



An iguana burrow on St. Lucia.

*see the successes of that. We know that even schoolchildren know some of the basic facts about the parrot and appreciate it. We would like to create that sort of attitude in people toward the iguana, but we know that, right now, some people just look at the iguana as a lizard, that it's not good looking, and it might not be friendly."*

— Alwin Dornelly,  
Wildlife Officer, St. Lucia



Young adult St Lucian Iguana.

Clearly, this mirrors an attitude that unfortunately is common throughout tropical regions of the world. People fail to appreciate their wildlife resources and are likely to dislike, misunderstand, or merely exploit them. The only effective means of changing attitudes is education. Posters designed as part of a local school's activity program and other activities such as games, coloring books, and children's lacing trainers made by parents and teachers are methods that are being used



## Anomalous Hatchlings

*All photographs by Matthew Morton.*

As part of the effort to protect and conserve the current population of St. Lucian Green Iguanas, Matthew Morton of the Durrell Wildlife Conservation Trust has been regularly checking hatchlings on the nesting beach at Louvet. Among this year's hatchlings, Morton observed a number of anomalies.



Hatchling St. Lucian Iguanas: the individual on the left suffers from patches of gray scales that most likely were caused or exacerbated by bacterial or fungal agents, the hatchling on the upper right suffers from possible hydrocephaly or an abscess, whereas the youngster on the bottom right is quite healthy.

Multiple "nest sites" are located at Louvet, at most of which multiple females have nested. Four of the main sites and five of the less heavily patronized ones have been fenced. Thus, certain effects can be described as "per nest-site" and others as "per clutch," and have a higher probability of being due to nesting conditions or to circumstances originating with the parents, respectively. However, causative agents remain in all cases speculative.

Some individuals appeared grubby and unhealthy with patches of gray scales in various locations on their bodies. Some clutches seem to have many individuals with this condition, whereas most have no affected animals. This condition also was observed in a few of last year's hatchlings. This does not appear to be normal shedding and preliminary observations suggest that the affected hatchlings also

tend to have hatching weights toward the low end of the scale.

One suggested cause for the grey patches was a bacterial infection acquired in the nest. This would account for some clutches being affected more than others. The mother could pass a bacterial infection to the developing embryos. Bacteria will incubate in the developing eggs and can produce systemic infections in the hatchlings. Secondary opportunistic organisms can localize topically and result in the skin discoloration. Fungal infections also may be responsible, particularly given the damp nesting environment.

A different potential cause is poor nutritional status of the mother. The absence of necessary trace minerals such as selenium or vitamins such as B<sub>1</sub> may singly or in combination result in problems such as malabsorbed yolk sacks or too little yolk to support a hatchling in the last hours before hatching and the first days thereafter.

Morton also observed some overt birth defects, mainly tails that were kinked very slightly in the terminal few millimeters and occasionally a more pronounced kink higher up. Again this seemed to affect several individuals in some clutches and none in others. This is most likely attributable to extreme incubation temperatures, although the possibility of inbreeding within a small population exists as well. A single individual displayed what appeared to be hydrocephaly, a condition that, in humans at least,



These hatchling St. Lucian Iguanas emerged from a single nest; the missing portions of their tails probably fell victim to a rat or land crab invading their nest.

can be congenital. However, one observer suggested that this might simply have been an abscess.

Yet another unusual observation was made initially in nine hatchlings, all of which emerged from a single, closely watched nest with various portions of their tails missing. Without a stabilizing tail, these animals were a lot slower and clumsier, fishtailing from side to side as they attempted to run. Consequently, they were much easier to catch (and photograph). The most likely culprit in this instance is a rat or a land crab that burrowed into the nest, a conjecture sup-

ported by the fact that more hatchlings with missing tail portions were subsequently observed emerging from other nests.

### Acknowledgments

Jenny Daltry (FFI), Matthias Goetz (Durrell Wildlife Conservation Trust), Karen Graham (Sedgwick County Zoo), Rick Hudson (Fort Worth Zoo), Jeff Lemm (San Diego Zoo), and Juliann Sweet responded to inquiries regarding the possible causes for the various anomalies.

to get the message to adults and children at the same time.

On some islands people are brought up eating iguana as a delicacy. This is not sustainable.

*“Actually, we’ve always recognized that the St. Lucian Iguana was in dire straits in terms of its numbers and its chance of survival because we’ve had a history of hunting iguanas in St. Lucia. Even [though] we had the wildlife laws passed in 1980 with a fine of 5,000 [Eastern Caribbean] dollars for anyone convicted of catching or killing an iguana [St. Lucian law also allows for fines and imprisonment for possession of an iguana], it is very difficult to catch somebody ‘in the act,’ because the areas are very remote and [representatives of the Forestry Department] are stretched in terms of numbers: we don’t have the Forestry Officers to police everywhere. When you go to investigate an area, people are tight-lipped — they won’t speak out. It’s hard to get any firm evidence. We have been trying to source funding for a long time to get extra help. In the Wildlife Section, I am the only person working there until recently. Now Alwin Dornelly is my assistant. With aid from Durrell Wildlife [and funding grants from the Iguana Specialist Group and the International Iguana Foundation], we’re now able to do the things we always wanted to do ... doing surveys, finding out where the population is, finding the threats where they are nesting, and other things.*


*“I can say right now that we have a pretty good handle on where the iguanas are located and a pretty good idea as to where they are nesting,*

*and I’m sure that we will get a pretty good idea of the size of the population.”*

— Donald Anthony,  
Wildlife Officer, St. Lucia

Much work remains. This is only the second year of research and plans are in place to conduct extensive observations of hatchlings on the main nesting beach this year. With time, a much better picture regarding the status of these lizards will emerge.

Species are disappearing at an alarming rate and we now know that we must act immediately when warning signs are seen. The California Giant Condor (*Gymnogyps californianus*) and Spix’s Macaw (*Cyanopsitta spixii*) are two high-profile species that have disappeared in the wild. The Grand Cayman Blue Iguana (*Cyclura lewisi*) also is on the brink of extinction.

On St. Lucia, hope prevails. Enough iguanas survive at the moment and the means by which their numbers are being depleted are now well known. The right people are in place to deal with the situation. This beautiful and distinctive Green Iguana is one of the jewels of the Caribbean — and it deserves a future. 

### Acknowledgments

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