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Adult female stout  
iguana, *Cyclura*  
*pinguis*, Guana Island,  
British Virgin Islands.  
Photograph: Gareth Rockliffe

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The International Iguana Society, Inc. is a non-profit, international organization dedicated to the preservation of the biological diversity of iguanas through habitat preservation, active conservation, research, captive breeding and the dissemination of information.

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# The Stout Iguana of the British Virgin Islands

James Lazell

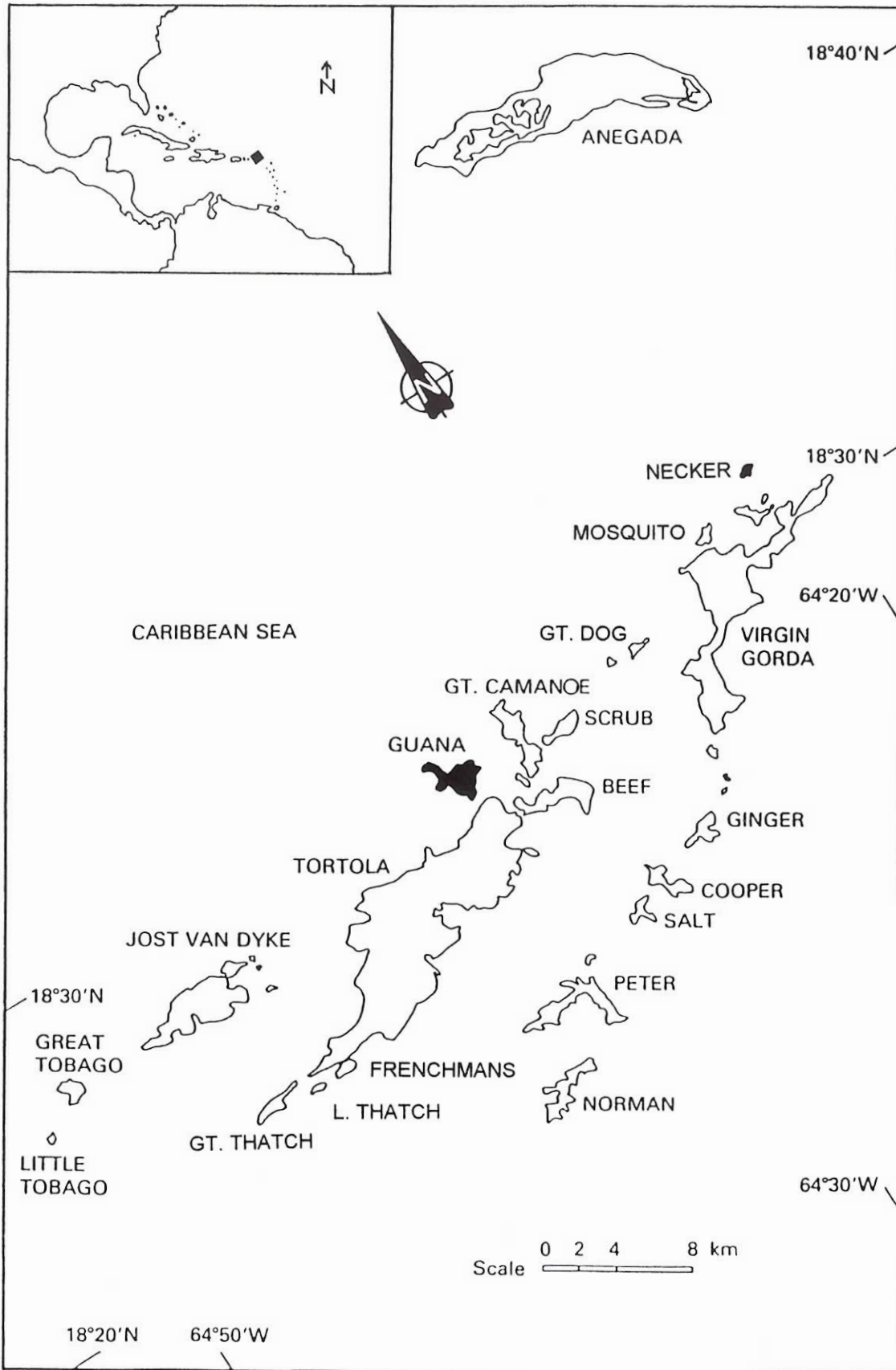
Which is the largest, the most anatomically distinctive, the rarest and most critically endangered of all West Indian iguanas? Perhaps none of those questions has a clear, unequivocal answer—there is always the possibility of dissent—but my vote has to go to the stout or “Anegada” iguana, “*Cyclura pinguis*,” today confined to only three islands. These are ponderous beasts, said to attain weights of more than 60 pounds and lengths over six feet. Its species name *pinguis* means stout.

Apart from mass, the stout iguana has several remarkable anatomical features. First and most obviously, it lacks caudal verticils—rings of enlarged scales set off from the ordinary scales on the tail. The name *Cyclura* means ring tail. These caudal

verticils are the only anatomical character provided in keys or field guides for recognizing the genus *Cyclura*, said to occupy the entire Greater Antilles, of which the British Virgin Islands (BVI) are the extreme eastern extension. The species *Iguana iguana* and *I. delicatissima*, native to the Lesser Antilles, similarly lack caudal verticils. As is well known, herpetologists are wonderfully imaginative people. Still it is surprising to read in Schwartz and Henderson (1991) of scale counts to the “first caudal verticil,” or “in the fifth caudal verticil.” As in all iguanas, there is variation in tail scale size, but if one can discern verticils of distinctive scales on the tail of *pinguis*, one can surely perceive them equally well on *Iguana iguana* and *I. delicatissima*. Apart from the fact that *pinguis* has, overall, larger scales



Adult male stout iguana basking in a loblolly tree (*Pisonia subcordata*) on Guana Island. Stout iguanas are moderately arboreal at all stages of life. Photograph: Gareth Rockliffe



The British Virgin Islands, showing islands mentioned in the text. Guana and Necker Islands are shaded.

than other iguanas, the three eastern species are similar in caudal squamation.

Schwartz and Henderson's (1991) account also leaves out the fact that adult male stout iguanas typically develop very dark—even sooty blackish—heads and necks. Schwartz and Henderson also said “juveniles presumably like adults,” but this is not at all the case. Hatchling stout iguanas are very pale in ground color but have bold dark transverse bands. The ground color varies from gray with greenish tints (“lichenate” is a good descriptor) to green. The greens vary from olive to bright blue-green or aquamarine, and are richest posteriorly and middorsally. While baby stout iguanas are never the brilliant “arsenic” green of most *Iguana iguana* and *I. delicatissima* babies, they are typically much greener than the western species.

There are two other striking similarities among these three species that set them off from their western relatives. Their lateral teeth are complexly cusped, with many more points (cusps) than are seen on the simpler, fleur-de-lis teeth of normal *Cyclura*. And the floor of the braincase, in all species a bone called the parabasisphenoid, is very

broad in *iguana*, *delicatissima*, and *pinguis*, but very narrow in western *Cyclura*. The stout iguana, however, is unique in having the largest body scales and the lowest, least developed crest scales of any West Indian iguana.

Although I began biogeographic and evolutionary studies of West Indian iguanas more than 40 years ago, I did not meet a stout iguana until 1980. At that time I was commissioned to do a study of wildlife for the government of the BVI. There were already plans to develop a national park on Anegada: the low, flat, easternmost island in the group. Apart from bones and stories, stout iguanas were then known from nowhere else. Back then, stout iguanas were still common on Anegada. I saw enormous individuals, far larger than any other iguanas I have ever seen elsewhere. However, the situation was bleak.

Beginning about 1960, major development schemes—eliminating or amalgamating entire islands—were promulgated in the BVI. The most ambitious scheme was for Anegada, but it progressed only as far as the obliteration, by bulldozer, of Anegada's livestock paddocks. Traditionally, Anegadians relied heavily on careful animal hus-



A juvenile stout iguana. The white marking is latex paint, used for marking in our population studies on Guana Island.  
Photograph: Gareth Rockliffe

bandry on their dry island. Livestock—goats, sheep, cattle, swine, and burros—were kept within a vast system of stone fences. They were moved around, and even let out in small, well-tended herds, to browse and forage. The destruction of the stone walls freed the livestock, and was simply too great a catastrophe for the people to overcome and repair. Feral livestock, especially goats and burros, were in turn too much for the iguanas. Insidiously, the population dwindled.

Once the stout iguana enjoyed a vast range. It was the native species of Puerto Rico and all the U.S. Virgin Islands except St. Croix. Stout iguana bones are a common and nearly ubiquitous component of the middens, refuse heaps, left by Native Americans who began populating these islands at least three thousand years ago. Early European settlers, especially from Spain and France, also consumed these big, relatively slow lizards. By the twentieth century, Anegada may have harbored the sole survivors. Major Chapman Grant, however, visited Guana Island (also in the BVI) in 1930 and said there were iguanas there. If so, they did not survive long.

By 1984 it was clear to me that the situation on Anegada was desperate. Although hatches of baby iguanas occurred annually, there were many fewer iguanas than even four years earlier in 1980. Most of the survivors were old males. Adult females were scarce and getting scarcer. I believe they virtually commit physiological suicide in the process (no doubt involuntary) of trying to get enough food energy to yolk up egg clutches. Males, of course, do not expend much energy on reproduction. Also, males are much larger and hold vastly larger territories. Females, and youngsters past their hatchling carnivorous stage, simply cannot compete with goats. Although the great national park plans still existed, and many Anegadians wanted the park to become a reality, land title issues seemed impossible to resolve. I decided to attempt bringing stout iguanas back to Guana.

Louis Bigelow of Massachusetts bought Guana Island in 1934. The first things he did were to extirpate the goats and ban wood cutting for charcoal. He reduced the number of burros to two, and controlled their movements. He did not get rid of the sheep—the only other feral domestic



Adult female stout iguana, Guana Island, marked with white paint. *Photograph: Gareth Rockliffe*

livestock present—but he did control them. The vegetation began to recover. Bigelow also fenced a large sheep enclosure around the area where he began construction of the Guana Island Club buildings. Although sheep grazing outside the enclosure remained a problem, sheep are not as destructive as goats, and I believed conditions had improved to the point where iguanas could survive. Beginning in 1984, I brought eight stout iguanas, four males and four females, over from Anegada. The population has exploded. We now have bumper crops of hatchlings annually, with ongoing recruitment into the subadult and adult ranks. Adult females outnumber adult males by about three to one. Guana Island's snakes seem more common and seem to grow much bigger now. Each year, at hatching time, our population of red-tailed hawks seems to at least double, from the normally resident pair to four or five birds. Fecundity plus natural selection add up to iguana prosperity, and prosperity for their predators too.

In 1995 I took some youngsters over to Necker Island (also in the BVI). Necker has no feral livestock, not even rats. It will be at least 1999 before Necker iguanas reach potential breeding age, but the new residents seem to be doing very well. I am full of hope. There are at least three more privately owned islands in the BVI that may be suitable for stout iguana restocking: Great Dog, Mosquito, and Little Thatch. One BVI National Park, Fallen Jerusalem (a small island named for its wondrous stone topography) has been cleared of goats and other livestock. It no doubt needs some revegetation, but it could soon support stout iguanas.

For the foreseeable future, the best hope for the stout iguana's long term survival is to reestablish the species on as many small, predator- and competitor-free islands as possible within its former range. We must bear in mind that its former range was the entire Puerto Rico bank, certainly not just Anegada, or even the BVI. *Iguana iguana* has now been introduced to many of these islands. Private landowners typically like iguanas and want them on their properties. Land owners are little concerned with the subtleties of species differentiation, and will demonstrably import *Iguana iguana* from the U.S. Virgin islands, even to the BVI. Thus, Sandy Cay, in the BVI, is now infested with *Iguana iguana* introduced from St. John.



Adult male stout iguana basking in a loblolly tree on Guana Island. Photograph: Gareth Rockliffe


I see no hope of reestablishing stout iguanas on an island now populated by exotic green iguanas. We must act rapidly to reclaim as much stout iguana habitat as possible before potential sites are lost. Young stout iguanas from the Guana Island population are expendable, and can be excellent stock for restorations.

Of course, the fondest hope for the longterm conservation of the stout iguana is the Anegada national park. Even now, while some land title disputes remain, some have been settled and livestock enclosure areas—even if small—could be initiated. The BVI National Parks Trust and the IUCN Iguana Specialist Group have built a head-start pen on Anegada, and obtained a few of the increasingly rare local hatchlings to populate it. Meantime, Dr. Numi Goodyear Mitchell, of The Conservation Agency, has begun erecting more sheep enclosures on Guana Island. Of course, we continue to try to extirpate the last of the feral sheep.

Right now, Guana Island seems to hold the most secure population of stout iguanas. Their continued success there, however, depends on active management. For those concerned with inbreeding depression in small populations, Guana's sheep could provide a cautionary tale. Guana is steep and rugged. The big ravines—called ghuts—on the windward side were never cleared and support deep, dark forests which are perhaps the best remaining old growth in the Antillean lowlands today. The formerly cut-over areas have come back in dense second-growth jungles. We have waged war on the sheep. Repeatedly, we have hoped—or dreamed—we had finally got the last ones. Repeatedly, twinning twice a year, they have rebounded. Most West Indian sheep are blissfully stupid creatures, slow and seemingly lacking the senses to even perceive a large truck or bus at ten feet. The remaining sheep on Guana, coming through the gauntlets of many population bottlenecks, are fleet and agile. Not only have they apparently developed extrasensory perception, but they seem to have strategic planning capabilities greater than those of us who hunt them. If they exemplify inbreeding, then that is a wonderful thing.

Ironically, it would have been easier to eliminate the sheep if there were still goats. Goats eat many dense understory shrubs that sheep do not, and so clear out the woodland floor, increasing visibility. My strong advice to anyone planning iguana management and restoration is to get rid of all the feral ungulates on an island while still clearing out the goats. Once the goats are gone, any other remaining species will not only become greater competitors with iguanas, but will become much harder to control.

The stout iguanas of Guana Island are generally extremely popular with visitors. The owners of

Guana (who purchased the island in 1975 from Louis Bigleow), Dr. and Mrs. Henry Jarecki, have declared their Island a wildlife sanctuary. In addition to stout iguanas, successful restoration projects include tortoises, flamingos, and white-crowned pigeons—all species nearly or completely extirpated previously from the BVI. Island staff, especially Mr. Lynford Cooper, have taken a great interest, even developed a fondness, for the iguanas that just back in 1980 almost everyone seemed to hate and fear. Guana Island today is a destination resort for a small number of tourists. While most enjoy seeing iguanas, some are actually frightened of them. The biggest Guana individual I have weighed was a mere 23 pounds, but I have seen lots of others that were bigger than he was (and he has grown a lot since I weighed him in 1986). There is one legendary fellow known as "Monster" who, it is said, could swallow a 23-pounder like one of those swallows a grape. Maybe I will catch him next year. 

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# Moon Over Mayaguana

## Return to Booby Cay

John Bendon

**Dec 10th 1997**

**I**t was with some trepidation that I stepped off the plane in Nassau, watching for Mr. Eric Carey from the Ministry of Agriculture, Bahamas. It had been nine months since my last trip to Mayaguana and I was preparing for the second chapter—the arrangements to ensure the continuing protection of Bartschi's Rock Iguana, *Cyclura carinata bartschi*.

During the time that had passed, I wrote letters, made phone calls, campaigned for money and wrote articles; all about the plight of the Booby Cay Iguana. The image I had of them running free on their own island, enjoying the sun, unaware of the threat to their existence, has stayed with me since my last visit.

I met with Eric Carey from the Ministry of Agriculture, who gave me the necessary research permit, and Sandra Buckner, from the Bahamas National Trust, who explained the botanical sights I might encounter on Booby Cay.

The main point of discussion was the removal of the goats that live on the cay. They are the main threat (apart from man) to the survival of the iguanas and their food source. The goats eat voraciously and could easily multiply and denude parts of the cay, destroying plants essential to the iguanas survival. One proposed solution was to move the goats to the mainland. Alternately, The I.I.S. had offered to pay for a fence to be built to keep the goats from straying and doing damage. With a count last March of only 200 lizards, I decided to pursue the matter to see what could be done as soon as possible.

The morning after our meeting, I set out with camera, permits, letters of introduction and a plant

press in hand, emerging from the plane on a sunny morning in Mayaguana.

I was met at the airport by the commissioner of Mayaguana, Mrs. Mildred Williamson, who is the Family Island Administrator for Mayaguana. We went to her office where we were joined by Mr. Thomas Charlton (the son of Rev. Edwin Charlton, the owner of the goats). His family has grazed goats on Booby Cay for many years. Apparently it has always been easy to keep the goats in check there, as no fence was needed and goats do not swim. Unfortunately, the Rev. Charlton had taken ill recently and was flown off the island for treatment. He left instructions with his son, Thomas, to deal amicably with me and see what we could work out.

I started by showing them my photographs of iguanas from various parts of the Americas, explaining that there are many different iguanas, and that each species is unique. The Bahamas has seven different species, two of which

only inhabit one cay each. The Booby Cay iguana is one of them. I explained that it lived nowhere else on Earth and that it was different from all other iguanas. I told them how lucky the Mayaguana people were to have such a rare animal in their midst and that the cay that it lived on was totally essential to the life of the iguana.

After all my explanations and photographs, both Mrs. Williamson and Mr. Charlton were very taken with the idea that their island had such a distinguished resident. They were excited by the news that the I.I.S. wanted to put up a sign which tells the story of the iguana to any visitors. I gave Mrs. Williamson some copies of *Iguana Times* (Vol. 6, No. 1) which featured *Cyclura carinata bartschi*

***The moon still rises  
over Mayaguana,  
where the Booby Cay  
Iguana now lives  
a safer, more  
protected existence.***

on the front cover, and an article detailing my previous trip. She promised to hand them out to all the schoolteachers on the island so that the children might grow up with respect for an endangered species and its habitat.

The hours I spent with these charming people went quickly, and the final question I had was, "What shall we do?" The answer was immediate. They both thought the goats should be removed as soon as possible. Would it be that easy? The goats apparently could be removed from the cay as soon as it could be arranged, and put on the mainland near Abraham's Settlement. Or, alternatively, they could be turned into curried goat or goat stew. Whatever they did with them, there would be no need for a fence! That immediately eliminated a large part of the cost of this operation—I was very pleased. Additionally, this operation could be done at no expense to Mr. Charlton or his family, and at no expense to the Society. I asked them if it was that simple, and was told that it was.

We all shook hands and it was done. I was very surprised at how easy it really was, but of course it had yet to be achieved.

### 13th December 1997

I was awakened at 5:30 a.m.—it was still dark at Cap Brown's house, where I was staying. He brought me in a cup of tea and a lunchpack made up by his wife, Doris. I had made arrangements to be taken by boat out to Booby Cay that morning so that I could do another survey, and catch sight of my scaly friends once again.

Half an hour later I was on the boat zooming out over the waves. I saw the sun come up over the Atlantic Ocean, turning the waters yellow and the skies light blue. The pilot, an expert fisherman, guided his boat carefully around the treacherous reefs that surround Mayaguana. After an hour and a half, when we were about 1000 meters from Booby Cay, I saw a pink smudge on the beach, stretching about 100 meters wide. On closer approach the smudge turned into a large group of flamingos standing on the beach, and in the water. I was anxious to land and start photographing them, but I knew that they would all fly off before I got there. As we approached, they did indeed fly off. After exiting the boat, I sat on the beach by a bush and got out my camera and notebook. The



Female subadult, *Cyclura carinata bartschi*, in vegetation. Photograph: John Bendon



Tail drags and foot prints, Booby Cay. *Photograph: John Bendon*

fisherman took off, saying he'd be back at lunch-time for me. I sat there alone in the sunrise and the silence, listening for iguanas.

Suddenly, I heard a flapping sound and looked above me to see about eighty flamingos coming in to land. Because I was still, they didn't see me. I didn't move a muscle except for putting a finger on the camera button and slowly putting the viewfinder to my eye. I managed to get some good shots and realized that this was probably a unique experience, possibly the first time anyone has photographed these birds on Booby Cay. The locals had told me that the flamingos land there all the time. The bulk of the Bahamian flamingos live on Inagua, about half an hour away by plane, over 60,000 of them. As I watched, they rooted around on the beach and in the shallow water, then took off, flew around, landed again, took off again, and so on. After 9 a.m. they flew away and did not return.

I started walking around, looking for iguanas and taking note of the vegetation. This time, marking my map where I saw burrows. I saw used and unused burrows. The ones in use had tail



Large adult male in habitat. *Photograph: John Bendon*



Booby Cay, Mayaguana—the realm of *Cyclura carinata bartschi*. Photograph: John Bendon

drags leading from them, obviously fresh (see photo), whereas the unused or abandoned ones had no tail tracks around them. It looks like the iguanas dig new burrows for themselves from time to time, and as I toured the cay I discovered one reason for this.

Iguanas are difficult to see because of their markings, their motionlessness, and their ability to see us and scatter before we see them. Nevertheless, I walked around slowly and quietly and they popped up all over the place. I marked on my map where I saw them.

The first one I saw, a male, had dark colored smears around its mouth, and I ascertained that it had just eaten the seedy fruit of the silver buttonwood, a tree that grows on most Bahamian Cays that support iguanas. I also noticed seven year apple, *Sesuvium*, sea grape and *Opuntia*, all of which are eaten by iguanas. The iguanas had obviously been out and about before I arrived as there were fresh tracks all over the place. I found some dried iguana droppings. After examining them, I put them away to take back to Florida for analysis. I tried to photograph some basking iguanas, but

they were very quick and darted under bushes, where they could still bask in the narrow rays of light that filtered through the leaves. During this trip, I only managed to photograph the animals by creeping around and looking through bushes. They seemed more timid than the last trip, as I recall a female at the time who had tried to share my lunch. It is a different time of year, so perhaps their behavior is different. There were obviously no gravid females around, all the eggs having been laid and hatched by November and there was no sign of what might be sexual activity. They were just sniffing around, getting their breakfast and enjoying the sun.

With map and camera in hand, I started off around the cay. I decided to walk on the northwestern shoreline first as I had not covered this thoroughly enough last time. I found the beach covered with tail drags and bird tracks, and a very unusual type of track that puzzled me at first. The track was quite strange (and fresh) there in the new sand and it looked just like the track made by the tires of a mountain bike. I made a drawing of it and thought about it for a while. There was a

hole in the ground with this strange track coming from it. It was only later that I realized that it was the track of a hermit crab. I saw more than one and they ranged in size from 1½" to 4" wide.

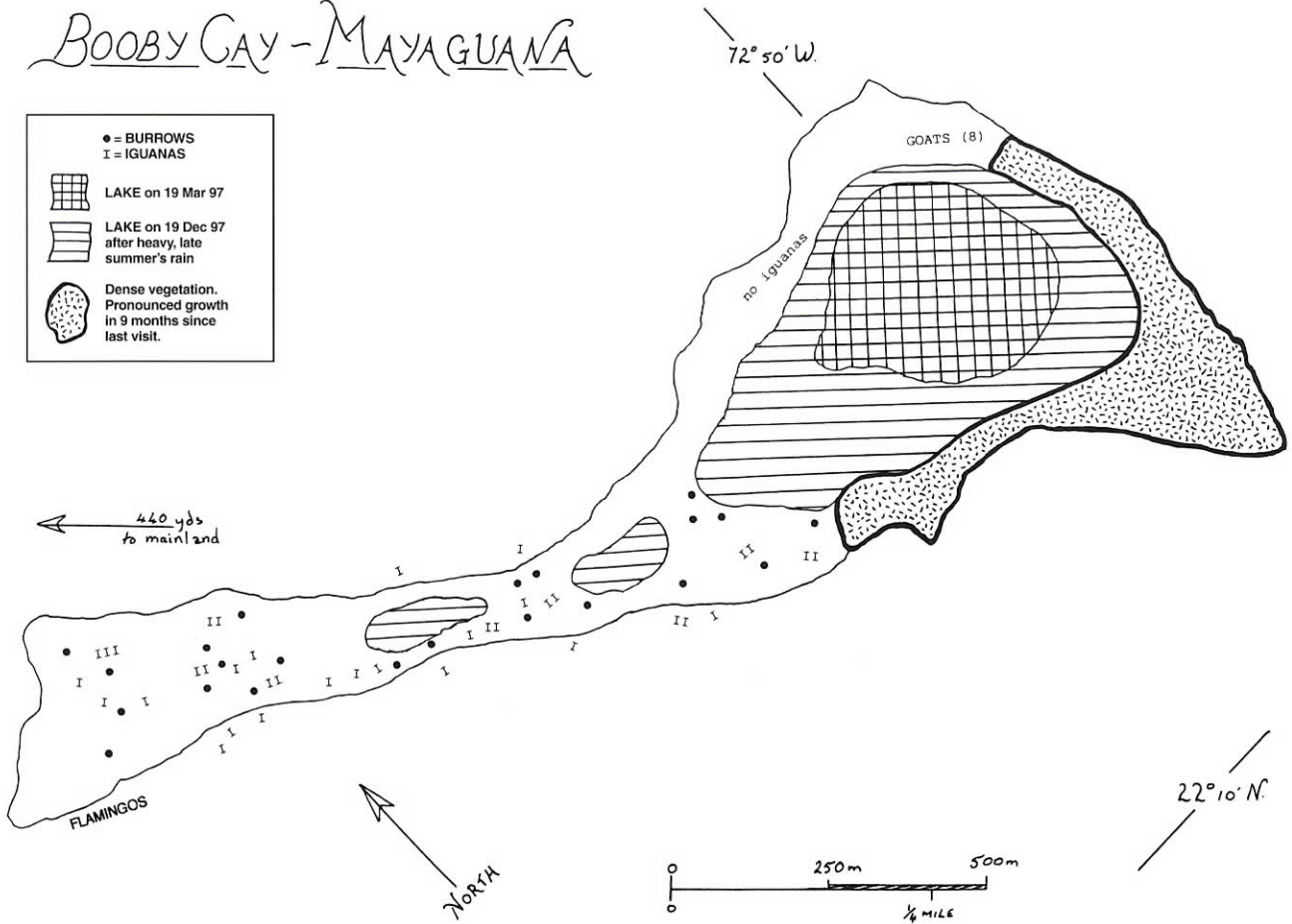
I continued my walk, counting scurrying iguanas and noting their sex and their burrows. *Cyclura carinata bartschi* is very easy to distinguish sexually. The males are blue-gray with white markings and some white scales, a larger, fatter head, more of a throat fan and bigger jowls. The females are grey-green with some white scales, and a much thinner head and jowls. The color of the female's iris is light yellow, while the male's is a darker yellow. The spines of the female are light-colored, short, stiff and sharp. The male's spines are longer, wider, flatter and flop to one side.

As I went east along the cay, I noticed that the landscape had changed. On my new map, note the size and position of the lake in March 1997. Dur-

ing September there were heavy rains—a yearly occurrence. The dips in the middle of the cay had filled up with water, creating one very large lake and two smaller ones. In the extreme south and east of the cay the vegetation had grown so thick I could not walk through it. I could see, though, by bending down, that the iguanas could live in it easily—there was at least a foot of space between ground level and the first branches of the shrubs. I could see places covered in water where I knew there were old burrows that I saw on my last visit. The lizards would have moved from there, obviously, and dug new burrows on higher ground. An old (1973) ordinance survey map, made by the British, shows Booby Cay almost entirely covered in a lake. This means that the cay's living area is drastically reduced during some parts of the year, forcing them to be more crowded. Perhaps this is why the population is so small, as it is based on square footage at the

# BOOBY CAY - MAYAGUANA

●	= BURROWS
I	= IGUANAS
	LAKE on 19 Mar 97
	LAKE on 19 Dec 97 after heavy, late summer's rain
	Dense vegetation. Pronounced growth in 9 months since last visit.



Booby Cay, Mayaguana.

leanest time. All the more reason to remove the goats, as goats can graze anywhere and these iguanas specifically need this little island.

Of the 37 iguanas I counted this time, 24 were males and 13 were females (about a 2:1 ratio). This differs from what I found on my last visit where, of approximately 47 animals, the majority were females, and only six were males. I can now add at least 18 males to the overall count from the last trip, making at least 65 animals sighted altogether. I also counted 22 burrows in use and saw unused ones which I did not count. The speed at which they were darting around was amazing. They all seemed very active, although towards the hottest part of the day they slowed down or went back into their burrows.

I took many photographs and was very pleased with the life I saw around me. My time there went very quickly and before I knew it I was being whisked away in the boat, back to the mainland.

### Dec 14th 1997

Sundays on Mayaguana are very quiet. I met various people in the street who already knew of my project, and asked if I had been to see the iguanas yet. They all seemed to be interested in

what I was doing. Since I would be leaving on the next morning's plane for Nassau, I went down to see Mrs. Williamson, the Commissioner, to say goodbye. I spent that day writing on the beach and went to bed exhausted. When the moon came up that night, it was full and silent.

### Epilogue

A final word on all of this, having nothing to do with iguanas: the people of Mayaguana are among the most hospitable and gentle people I have known in all my years of travel. This trip, I was there for four days and met just about everyone in all three settlements. I was made to feel welcome by one and all; I was asked in to everyone's homes.


Before my departure, people arrived at the airport two and a half hours before take-off—it was like a community center social—probably the only time of the week that folk got together to see each other and to see what was what. I was sad to say goodbye. Although this little travelog has come to its end, my own non-scientific approach to scientific conservation continues. The next project will be to concentrate on saving the Sandy or White Cay Rock Iguana, *Cyclura rileyi cristata*, from



Adult female Booby Cay iguana. Photograph: John Bendon



Adult male Booby Cay iguana. *Photograph: John Bendon*

almost certain extinction. It is the only other lizard in the Bahamas that is exclusive to one cay. *All* the iguanas of the world are worth saving, as much as any other of the Earth's beasts, and while the moon rises silent and bright over Mayaguana, and the stars speak their stories, ever nearer, ever clearer, Bartsch's lizard will be one of the first to prosper due to our caring. The other Bahamian lizards are waiting in line, unknowingly, and they too, will have their day. 

All photographs Copyright ©1998 J.S. Bendon, U.K.

The International Iguana Society would like to thank Natures Image T-Shirts, Dorset, U.K. for their generous donation to the Booby Cay project.



Entrance of permanent burrow and droppings. *Photograph: John Bendon*

14th November 1997

Dr. Maurice Isaacs  
 Dr. Eric Carey,  
 Ministry of Agriculture, Conservation Dept.,  
 P.O. Box N3704, Nassau, Bahamas

Dear Eric,

This is in reply to our conversation of 4th November 1997. I would like to inform you of a donation received for the purpose of construction of a goat corral on Mayaguana if the residents are agreeable to this. The purpose of the enclosure is to allow for amicable removal of goats from Booby Cay, the only known habitat of Bartsch's Rock Iguana, *Cyclura carinata bartschi*.

The goats appear to be the only threat at present to this species. Their long-term presence will probably have a negative impact upon the vegetation communities on Booby Cay and they undoubtedly compete with the iguanas for the food resources on the cay at present. We understand the importance of goats to rural residents in isolated parts of the Bahamas, but we feel their removal is necessary to ensure the long term survival of *C.c.bartschi*.

We respectfully propose constructing an enclosure near Abraham's Settlement, on an appropriate site, as an alternative to leaving goats on Booby Cay. The International Iguana Society is willing to pay \$1000.00 for materials and construction of a steel-post, 5 ft. high, chain-link fence enclosure as a permanent structure. We would probably be able to supply a certain amount of volunteers to work on said construction. We would appreciate if you would contact the residents and authorities on Mayaguana as soon as convenient.

Mr. John Bendon is willing to act as a liaison and travel to the island more than once to facilitate the construction of the corral.

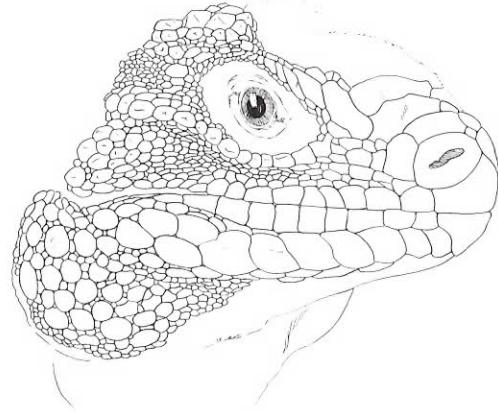
We would probably need to employ some local people to help during construction and would try to build as large a structure as possible according to the funds we have available. We believe construction of an enclosure to be an equitable solution and a benefit to the residents of Mayaguana, as well as being of prime benefit to a shrinking species of Bahamian wildlife. The iguanas have potential as a tourist attraction, under supervision, and as an economic benefit. We need to know what the feelings of the residents and the goat-owners are in the near future if we are to move forward. Mr. Bendon is willing to travel with the ministry representative to the island for the purpose of finding a location for the enclosure and to discuss other details with the authorities and residents.

We appreciate your attention on this matter and await your reply.

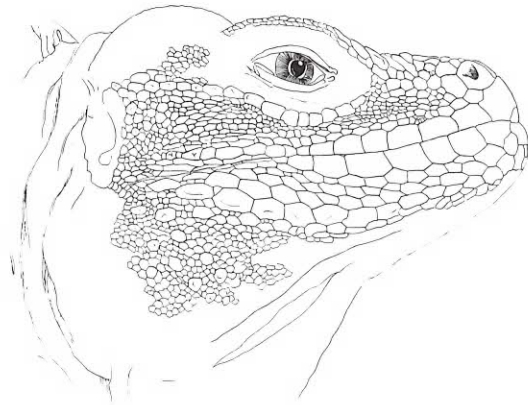
Sincerely  
 Robert W. Ehrig, President,  
 International Iguana Society, Inc.

## Correction...

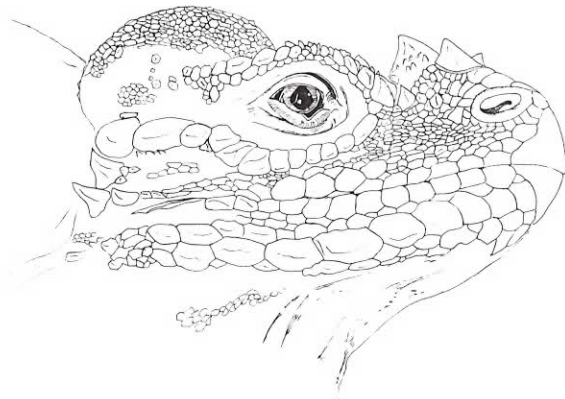
In the previous issue of *Iguana Times* (Vol. 6, No. 3), two of the scalation renderings by John Bendon on page 59 were incorrectly labeled. Below are the correctly labeled illustrations. We apologize for confusion this may have caused.



*Cyclura cyclura cyclura*



*Cyclura ricordi*



*Cyclura cornuta*



# LIZARD LETTERS

## Dear Editor:

I was glad to see *Iguana delicatissima* get good play in your last issue. However, several points need fine tuning.

To the Fuhris: give up on Saba — that island is populated by *Iguana iguana*. My old paper, cited below, is still available, cheap, from the Museum of Comparative Zoology, Harvard University, Cambridge, MA 02138. It provides island-by-island data on species presence, although many of the populations of 30 years ago are now sadly depleted, or even extirpated. Mark Day, and his colleagues from UK, have done extensive field work on *delicatissima*, but if their results have been published, they have not sent me reprints.

To David Warner: Iguana classification is not as straightforward as you claim. In fact, I understand that a very recent paper, based on molecular biology, totally demolishes Frost and Etheridge's scheme, but I have not seen this work yet: Macey *et al.*, 1997. *Journal of Molecular Evolution* 44:660-674. Many biologists do not accept the Frost and Etheridge split (e.g., Hedges 1996). Sites, *et al.*, in their Figure 5C, present a much more reasonable phylogeny than the one shown in Figure 3. About 20 percent of *Iguana delicatissima* have toe combs, so that characteristic does not define *Cyclura*.

And to Richard Gibson: Young *I. delicatissima* are vigorous predators, feeding almost exclusively on insects and small animals of many sorts, including other lizards. This species remains omnivorous and a facultative carnivore throughout life under natural conditions. Try feeding your hatchlings cockroaches, and follow the lead of Win and Laura as described by Janet Fuhri (IT 6(3): 54) for adults: meat weekly.

## References

- Hedges, S.B. 1996. The origin of West Indian amphibians and reptiles. *SSAR Contributions to Herpetology* 12: 95-128.  
Lazell, J. 1973. The lizard genus *Iguana* in the Lesser Antilles. *Bulletin of the Museum of Comparative Zoology* 145(1): 1-28.

Carry on!

James (Skip) Lazell  
The Conservation Agency  
6 Swinburne Street  
Jamestown, RI 02835

## Dear Mr. Ehrig:

This is written pursuant to your request for confirmation of the erection of the Iguana Society signs on Green Cay, San Salvador, Bahamas.

These two signs, one in English and one in French, were erected by Vincent Vogeli, Neil Storr, and Lloyd Jones, all employees of the Bahamian Field Station, on July 31, 1997. Enclosed you will find a photograph showing the signs, as well as several iguanas.

I am sending additional photographs to Sandra Buckner at the Bahamas National Trust, Nassau, Bahamas, for their records.

We were pleased to undertake this project for you, and if we can be of any further assistance in the future, please do not hesitate to contact us.

Sincerely,

Kathy D. Gerace

Secretary

BFS Board of Directors

Bahamian Field Station

Center for the Study of Archaeology, Biology, Geology,  
and Marine Science



This is the home of the  
**San Salvador Rock Iguana**  
*Cyclura rileyi rileyi*

One of the world's rarest lizards,  
it is found nowhere else on earth.  
The iguanas are protected by  
Bahamian and International law.  
It is illegal to harm or harass them  
in any way.

**Please protect them!**

Report any violations to the  
Commissioner's office.

Sign donated by the International Iguana Society

Signs were paid for by a collection made at the I.I.S. Conference on San Salvador in 1995 and by the I.I.S.

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Kathy D. Gerace  
Secretary  
BFS Board of Directors  
Bahamian Field Station  
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*Cyclura rileyi rileyi*

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## IGUANA NEWSBRIEFS

### Hybrid Galapagos Iguanas

During a field trip in March 1993, a supposed marine and land iguana hybrid was discovered on Plaza Sur. Morphological measurements, including weight, snout-vent length (SVL; measured to the nearest 1 mm from the anterior tip of the snout to the anterior edge of the vent), head width (measured at the widest part of the head), and jaw length (measured from the angle of the jaw to the tip of the snout), were taken from the hybrid and from 10

adult male and 10 adult female marine iguanas. Morphological measurements in the land iguanas were adopted from Snell *et al.* (1984) and Snell & Christian (1985), and were based on larger sample sizes. Blood (50-100 $\mu$ l) was collected from the tail vein of the presumed hybrid, from 10 morphologically typical marine iguanas, and from 10 land iguanas from Plaza Sur. Since this study was part of a larger project on the population genetic structure of the Galapagos iguanas (Rassmann *et al.*, 1997), blood samples were also available from most other major land and

marine iguana populations in the archipelago. Total DNA was extracted from the samples in a standard salt extraction (Bruford, Hanotte & Burke, 1992).

The presumed hybrid iguana was detected about 200 m inland, in close vicinity of both marine and land iguanas. The animal was an adult male (presumably >10 years) with 422 mm snout-vent length (SVL), but weighed only 2200 g and thus was in poor condition. The iguana's body size exceeded that of the largest marine iguana sampled on this island (a male with 377 mm SVL), but fell within the range of body sizes of the adult land iguanas from Plaza Sur. The relative size of the dorsal head scales was slightly larger in the putative hybrid than normally observed in the land iguanas, that they did not fully resemble the prominent pyramid-shaped scales of the marine iguanas. Also, its head was slightly more elongated than that of the marine iguanas, with a proportion of jaw length/head width of 1.34 compared to 1.24 in the marine iguanas. Perhaps the most conspicuous characteristic of the supposed hybrid was its coloration. The basic colour was not the rusty brown-yellow as found in the land iguanas, but resembled more the grey-black of the marine iguanas. However, it had prominent dorsal stripes of lighter colour, which are generally only present in young marine iguanas, and are not known in the land iguanas.

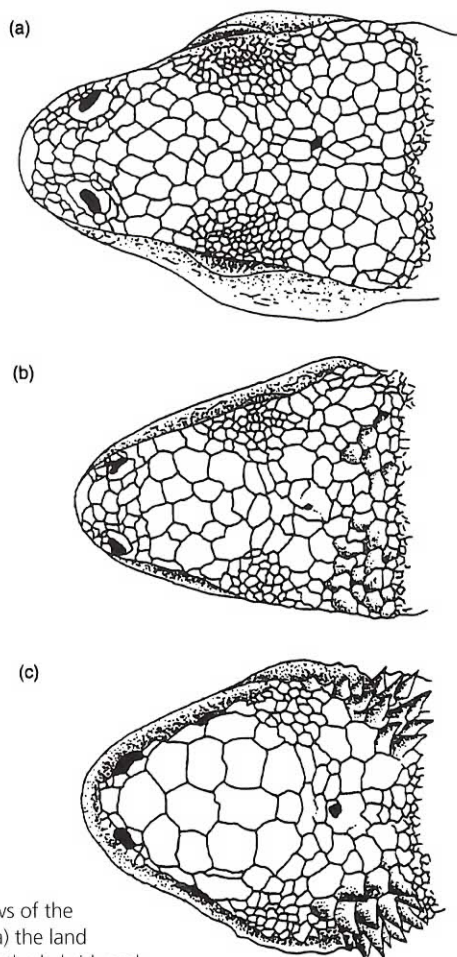
**EXCERPTED FROM:** Hybridization between the Galapagos land and marine iguana (*Conolophus subcristatus* and *Amblyrhynchus cristatus*) on Plaza Sur. K. Rassmann, F. Trillmich, D. Tautz. *Journal of Zoology*, The Zoological Society of London (1997) 242: 729-739.

### Illegal Reptile Trading Conviction/Imprisonment

February 3, 1998.

One of the nation's largest reptile import companies, Hollywood, Florida-based Strictly Reptiles Inc., yesterday had its export-import license revoked for five years for smuggling more than 1,500 rare reptiles into the United States, the federal government announced.

In July 1997, the company and its owner pled guilty to charges of conspiring to violate the Lacey Act, a federal law that protects endangered wildlife, by purchasing Indonesian reptiles between 1993 and 1995. Yesterday, the U.S. Fish and Wildlife Service revoked the company's license in connection with the plea. The company's owner and President, Michael J. Van Nostrand, is currently serving an eight month prison sentence followed by eight months of home confinement as part of his guilty plea. Under the plea agreement, Van Nostrand also had to pay nearly \$250,000 to the World Wildlife Fund to implement a government supervised restitutionary program to protect specific habitat in Indonesia that is home to the very creatures that were illegally trapped and smuggled. Additionally, the agreement bars the company and its owner from trading, selling or handling any endangered or threatened wildlife, as well as, certain species specifically identified in the agreement for five years. "This case shows that those who rob a nation of its rare and endangered wildlife out of personal greed will be brought to justice," said Lois Schiffer, Assistant Attorney General in charge



Dorsal views of the heads of (a) the land iguana, (b) the hybrid, and (c) the marine iguana. The land iguana has proportionally smaller and less conical scales than the marine iguana. The hybrid has intermediate characteristics between both types. The head sizes are not proportional to each other.

## IGUANA NEWSBRIEFS

of the Justice Department's Environment and Natural Resources Division. "Trafficking in endangered wildlife is prohibited under U.S. law and international treaty, and will not be tolerated." Thomas E. Scott, United States Attorney for the Southern District of Florida, where the case was prosecuted, said "this case represents the finest in international environmental enforcement: cooperation among enforcement agencies to protect irreplaceable species, effective and timely punishment of the violators of conservation laws, and a creative effort to mitigate the harm from the criminal conduct. I commend the agents, both here and abroad, who contributed to this resounding success." Van Nostrand and his company conspired to purchase Frilled Dragons and Fly River Turtles they knew were exported in violation of Indonesian law. Van Nostrand and his company also pled guilty to purchasing Argentinean reptiles, including Argentine Boas, Chaco Tortoises, Rainbow Boas, Red-footed Tortoises, Tegu Lizards, and Yellow-spotted Amazon Turtles, all of which they knew were smuggled into the country in violation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), an international treaty designed to protect wildlife from over-exploitation. The Indonesian chapter of the World Wildlife Fund will be responsible for operating the restitutionary program, which will focus on initiating, expanding, improving and maintaining wildlife projects in the Lorentz Strict Nature Reserve located on Irian Jaya—the Indonesian portion of the Island of New Guinea. The Lorentz

reserve is home to the Frilled Dragon and the Fly River Turtle and other protected species often imported by Strictly Reptiles. Because all Indonesian national parks and nature reserves suffer from funding shortages, the restitutionary funds will be used for practical programs such as training and certifying park guards and conservation bureau staff, providing critical equipment, and setting up "mobile awareness teams" to work with communities near the project sites to increase awareness about habitat protection and the illegality of poaching reptiles and other species. A portion of the funds also will be used to help communities, which often depend upon the income from wildlife poaching, to develop alternative means of earning money which are consistent with conservation goals. The investigation was conducted with the cooperation of authorities in the Netherlands, including the Netherlands National Police and the District Office of the Public Prosecutor at Breda. The Netherlands National Police helped spur the investigation by providing the U.S. Fish and Wildlife Service with audiotapes from electronic surveillance of Dutch reptile dealers revealing that protected Indonesian reptiles were being laundered through the Netherlands and shipped to Strictly Reptiles Inc., falsely labeled as captive bred to give them the appearance of lawful imports.

Source: U.S. Fish and Wildlife Service

## NEWS OF THE SOCIETY

### International Iguana Society Annual Treasurer's Report 10/1/96 Through 9/30/97

#### INCOME

Contributions .....	403.00
Dues Collected .....	7,917.00
Goods Sold .....	951.78
Interest .....	98.99
<b>TOTAL INCOME .....</b>	<b>9,370.77</b>

#### EXPENSES

Advertising and Promotions .....	60.00
Annual Conference .....	20.00
Box Rental .....	36.00
Conservation Assistance .....	960.00
Cost of Goods Sold .....	81.93
Foreign Checks .....	13.84
Government and Professional .....	211.25
Iguana Times	
Postage .....	2,399.07
Printing .....	7,162.65
Supplies .....	39.29
Contract Labor .....	568.20
Office Expenses	
Telephone .....	659.54
Office Expenses-Other .....	241.35
Renewal Notice .....	18.70
Returned Check .....	30.00
Uncategorized Expenses .....	82.86
<b>TOTAL EXPENSES .....</b>	<b>12,584.68</b>

**TOTAL INCOME/EXPENSES .... -3,213.91**

*Reported by Carl Fubri, Treasurer*

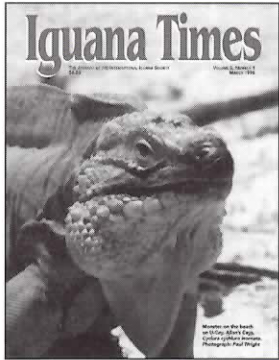
## REMINDER

**With this issue of Iguana Times your membership in the International Iguana Society expires.** We thank you and appreciate your support. Your membership dues support projects on behalf of many iguana species. We encourage you to renew your membership today.

For 1998, membership dues are \$25.00 for individuals and \$35.00 for organizations (which receive double copies of *Iguana Times*). Please write RENEWAL on your check, payable to International Iguana Society. Send to I.I.S., P.O. Box 366188, Bonita Springs, FL 34136

**NEW ADDRESS!**

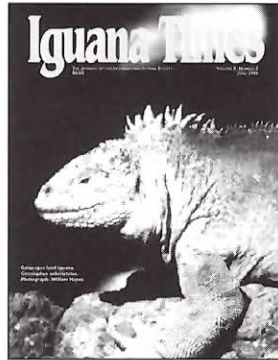
# Back Issues



**Volume 5, Number 1  
March 1996**

**Articles Featured:**

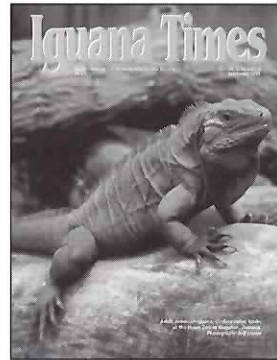
Psychosocialization of the Green Iguana: How to Better Handle Your Pet; Green Iguanas are Social Beings; International Sweep Targets Reptile Smugglers; Illegal Trade in Reptiles: Traffic Protected by Legal Void; Abstracts of Scientific Presentations from the 3rd Annual IIS Conference in San Salvador; Iguana: Survival of the Tastiest; Book Reviews; Lizard Letters; Iguana Newsbriefs



**Volume 5, Number 2  
June 1996**

**Articles Featured:**

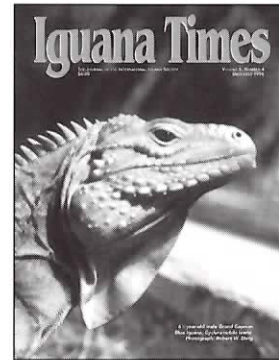
Lost in Time: Galapagos Land Iguanas; Northern Exposure: *C. c. cornuta*; Greasy Lizard Stuff; Iguanas, Salmonella and Herpetoculture: A Conflict of Interest... and Conscience?; Swampa Goes to Kindergarten to Help its Survival; Utila Iguana Gets Helping Hand from Foreign Friends; Lizard Letters; Treasurer's Report; Iguana Newsbriefs



**Volume 5, Number 3  
October 1996**

**Articles Featured:**

Lost and Found: Hope for the Jamaican Iguana; Genetic Studies of the Jamaican Iguana; *Cyclura* Forest Habitat; IIS *Cyclura* Island Habitat Classification System; Iguana Newsbriefs; News of the Society



**Volume 5, Number 4  
December 1996**

**Articles Featured:**

Any Hope for Grand Cayman's Blue Iguana?; Scapulation Renderings of *Cyclura nubiola lewisi* and *nubiola*; Surviving Atlantis: The Molecular Evolution of the Galapagos Iguanas; Iguana Report from Japan; IIS Conservation Award: Edwin Duffus; Lizard Letters; News of the Society

Volume 5

**Not pictured:** Volume 2, Numbers 2 through 4 are available for \$6.00 each

**Not available:** Volume 1, Number 1 through Volume 2, Number 1 are currently sold out, but may be reprinted in the future.

## Iguana Times Back Issues Order Form

**Check one or more:**

- Volume 3: 1994 (4 issues)  
 Volume 4: 1995 (4 issues)  
 Volume 5: 1996 (4 issues)  
 Individual issues:

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International Iguana Society, P.O. Box 430671, Big Pine Key, FL 33043

Please allow 3 weeks for delivery.

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## I.I.S. Bookstore

Photograph courtesy of Jayme Gordon



*As a service to our members, a limited number of publications will be distributed through the I.I.S. Bookstore. The following publications are now available:*

**Green Iguana, The Ultimate Owner's Manual**, by James W. Hatfield. 1996. **\$28.00** (including postage); **\$35.00** (nonmembers). Covers just about everything from birth to death of an iguana. 600+ pp. Limited quantities.

**The Green Iguana Manual**, by Philippe de Vosjoli. 1992. **\$7.00** (including postage); **\$8.75** (nonmembers).

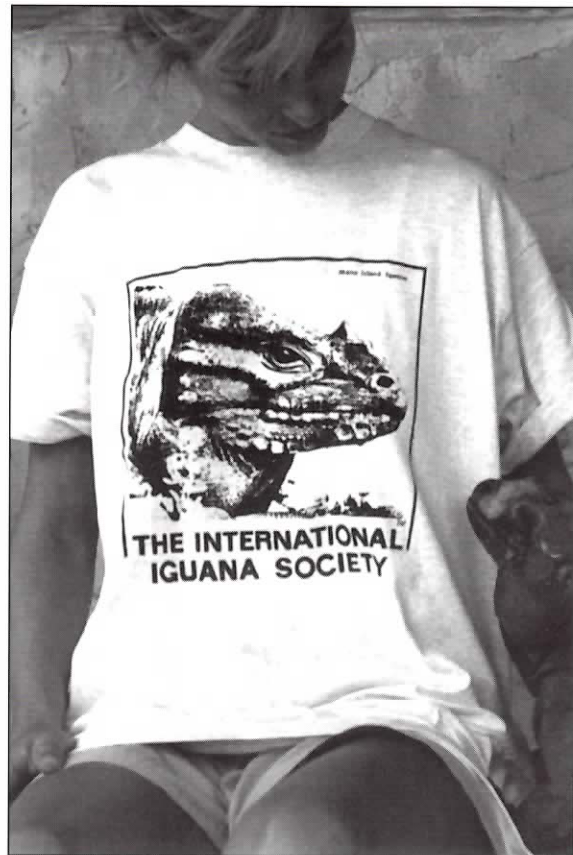
**Guide to the Identification of the Amphibians and Reptiles of the West Indies (Exclusive of Hispaniola)**, by Albert Schwartz and Robert Henderson. 1985. **\$19.00** (including postage); **\$27.00** (nonmembers).

**Schwarze Leguane**, by Gunther Köhler. 1993. **\$19.00** (including postage); **\$24.00** (non-members). Excellent Ctenosaur guide book, photographs, range maps, text in German.

**Send check or money order** (payable to International Iguana Society) **to:**

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P.O. Box 366188  
Bonita Springs, FL 34136

# THE ORIGINAL INTERNATIONAL IGUANA SOCIETY T-SHIRT



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featuring various species  
of your favorite iguanas!

*Still Only*

**\$12**

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The first shirt in the series,  
(pictured here) features  
Raul the Cuban iguana,  
*Cyclura nubila nubila*.  
*Illustration by*  
*John Bendon.*





Flamingos take flight on Booby Cay,  
Mayaguana, Bahamas.

(inset) Adult female *Cyclura carinata*  
*bartschi*, in habitat on Booby Cay.

Photographs: John Bendon