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A rare site: Adult male Grand Cayman Blue Iguana, *Cyclura nubila lewisi*, free-ranging on Grand Cayman Island. *Photograph: John Binns*

Statement of Purpose

The International Iguana Society, Inc. is a not-for-profit corporation dedicated to preserving the biological diversity of iguanas. We believe that the best way to protect iguanas and other native plants and animals is to preserve natural habitats and to encourage development of sustainable economies compatible with the maintenance of biodiversity. To this end, we will: (1) engage in active conservation, initiating, assisting, and funding conservation efforts in cooperation with U.S. and international governmental and private agencies; (2) promote educational efforts related to the preservation of biodiversity; (3) build connections between individuals and the academic, zoo, and conservation communities, providing conduits for education and for involving the general public in efforts to preserve endangered species; and (4) encourage the dissemination and exchange of information on the ecology, population biology, behavior, captive husbandry, taxonomy, and evolution of iguanas.

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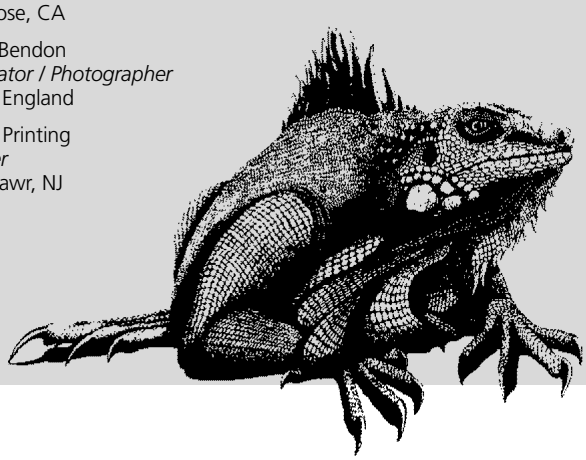
Members of the I.I.S. are encouraged to contribute articles, letters to the Editor, news items, and announcements for publication in *Iguana Times.* General articles can deal with any aspect of iguana biology, including conservation, behavior, ecology, physiology, systematics, husbandry, or other topics. Submission of photographs to accompany articles is encouraged.

Manuscripts based on original research are solicited to communicate recent findings not only to other scientists but to the general public as well. We wish to instill in our readers a greater appreciation for scientific research and a better understanding of how it can contribute to the conservation of threatened iguana populations or the well-being of captive specimens. Research Articles will be subjected to peer review, and should be fairly general in scope (i.e., manuscripts having extremely detailed theoretical or statistical bases should be submitted to more appropriate journals). Manuscripts of any length will be considered, and must be accompanied by an abstract of corresponding length. Authors can expect rapid turnaround time for the reviews and quick publication of acceptable material. Research Articles will be cited as appearing in the Journal of the International Iguana Society, and will be forwarded to the major citation and abstract journals. Research Updates should be comparatively brief and written in non-technical language. They will not be subjected to peer review. Submission of photographs to accompany research reports is encouraged.

All manuscripts must be typed, DOUBLE-SPACED, with 1" margins, on 8½" × 11" paper, following a format like that shown in the most recent issue of the journal. Original research articles must be submitted in triplicate. If at all possible, manuscripts should be accompanied by a disk (3½" or 5¼") containing a word-processing file of the manuscript. We support most word-processing applications in DOS, Windows, and Macintosh formats. Please include file name, software name, and version number on the disk; a hard copy printout is still required. Send manuscripts to the Editorial Coordinator, International Iguana Society, 133 Steele Road, West Hartford, CT 06119. Shorter articles, research updates, letters, and announcements may also be submitted via e-mail (send to ctenosaura@cyclura.com). For any contribution, please include your name, address, phone number, and e-mail address.



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Grand Cayman Blues:

The Struggle to Preserve *Cyclura nubila lewisi*

AJ Gutman, John Bendon, and John Binns

Conservationists have long been aware of the endangered status of *Cyclura nubila lewisi,* the Grand Cayman Blue Iguana. The National Trust for the Cayman Islands initiated a conservation plan as early as 1990; by 1995, after some initial setbacks due to pollution of the captive gene pool, only an estimated 150 animals remained in existence. By the fall of 2001, the number of surviving Blue Iguanas had barely increased — if at all. *Cyclura nubila lewisi* remains one of the most critically endangered reptiles in the world and urgent measures as well as public support are needed in order to ensure its long-term survival.

Current Status of *Cyclura nubila lewisi*

While the species once was known to range across all of Grand Cayman Island, Blue Iguanas had already been reduced to a low population density and restricted to a small area by the time initial surveys were conducted in 1938. *Cyclura n. lewisi* is currently classified as a subspecies of the Cuban Iguana, *C. n. nubila*; however, genetic studies indicate that it may be distinct on a species level. *Cyclura n. caymanensis,* native to neighboring Little Cayman Island and Cayman Brac, is thus more closely related to the Cuban Iguana than to the Blue Iguana (see Malone and Powell in *IT 9 (1&2)).*

Bonnie Raphael, of the Wildlife Conservation Society, and John Binns, of the International Reptile Conservation Foundation, draw blood from a Blue Iguana (*Cyclura nubila lewisi*) for health assessments and genetic testing. *Photograph by John Bendon.*

Historically, *C. n. lewisi* probably inhabited coastal environments, but it is now restricted to inland xerophytic shrubland, where it survives on a diet of leaves, flowers, and fruits supplemented occasionally by small invertebrates and fungi. Adults are primarily terrestrial, occupying rock hole retreats, whereas younger animals are somewhat more arboreal. Mating occurs in May, and clutches of 15–20 eggs are laid in June or July in pockets of red earth exposed to the sun.

Research performed by Fred Burton, Director of the captive breeding facility on Grand Cayman, and others, has revealed that Blue Iguanas maintain relatively high body temperatures (39–41°C) during the day. Their diet is almost entirely herbivorous, but includes scat and soil. Incubation of eggs, deposited in nests about 20 cm below the surface, occurs at about 32°C, and clutch sizes of captive animals increases by about two eggs per year for the first few years after the onset of sexual maturity.

Like all too many of the Rock Iguanas of the Caribbean, the greatest threat to the species' existence has been loss of habitat. Land cleared for agriculture or real estate development has left the remaining iguana habitat badly fragmented. Other continuing threats arise predominantly from introduced animals such as rats, cats, and dogs, which prey on eggs, juveniles, and adult iguanas, respectively. Although attempts are made to constantly reinforce public awareness of the

Female *Cyclura nubila lewisi* at the breeding facility. *Photograph by John Bendon.*

Blue Iguana among residents of Grand Cayman, the Green Iguana (*Iguana iguana*), introduced and now well established, is hunted by the local people for food. No laws prohibit the hunting of Green Iguanas, and the potential exists for confusing individuals who do not realize that these two species are very different and that only one of them is critically endangered.

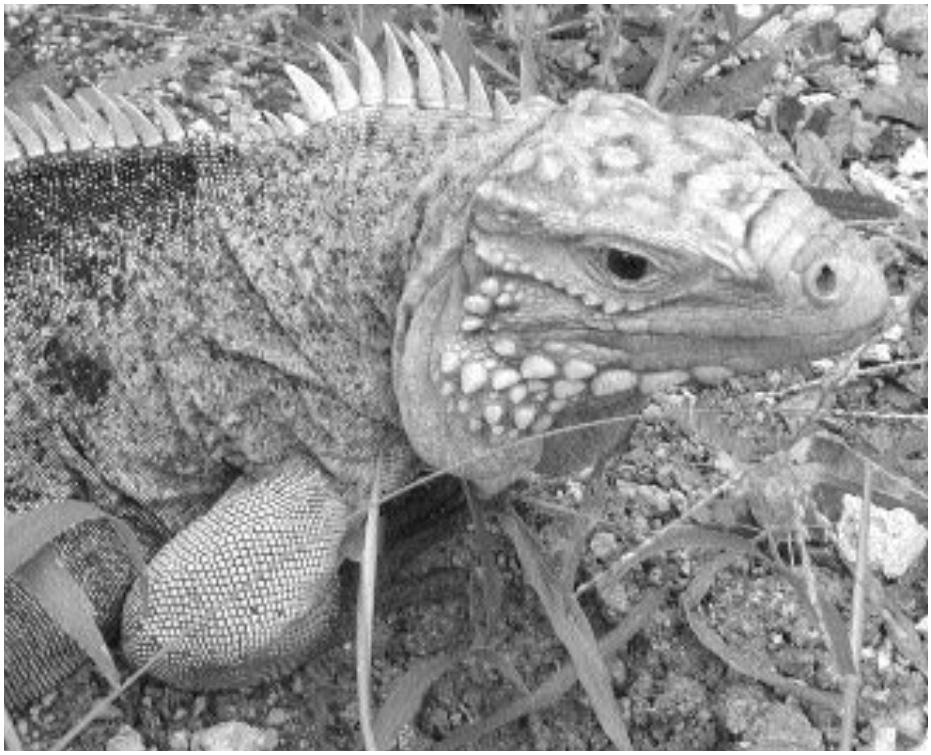
Captive breeding of *C. n. lewisi* began in 1990, along with initial studies of their diet, habitat needs, and behavior. Initial breeding stock incorporated animals which were being illegally held in captivity at various locations on the island plus hatchlings, which were found roaming in high risk areas, where they could easily end up as traffic fatalities.

Although captive breeding of a small number of animals has been sustained for many years, the difficulty has always been the limited amount of available habitat into which the animals could be released. Contact with animals released with radio-tracking devices would inevitably fail as they wandered beyond the limits of the preserve only to fall prey to farm dogs and road accidents. Releases were eventually restricted to the immediately adjacent Queen Elizabeth II Botanic Park, and the small population there is confirmed to be breeding in the wild as of 2001.

Today, the collection consists of 69 animals (versus approximately 100 in the wild), including the largest male in captivity (55 cm SVL, 71 cm tail) and the "grandmother," Sara, who is probably about 30 years old and is coming to the end of her egg-laying life.

The Grand Cayman Blue Iguana — Species Recovery Plan

Concurrent with the meeting of the World Union for the Conservation of Nature-Iguana Specialist Group (IUCN-ISG) in Grand Cayman during October 2001, a "*lewisi* workshop" was held. The end result of this workshop was the *C. n. lewisi* Species Recovery Plan, a document detailing wide-ranging conservation measures for the Blue Iguana. These measures are to be carried



Hybrid *Cyclura nubila lewisi* x *C. n. caymanensis*; note the markings on the head. *Photograph by John Bendon.*

Blue Iguanas: A Preliminary Status Report

The Blue Iguana Conservation Project

Grand Cayman, Cayman Islands

A two-phase survey is underway on Grand Cayman to reassess the status of the wild population of Blue Iguanas, *Cyclura nubila lewisi*. The first ten days of fieldwork were completed in early May, during which the Blue Iguana Conservation Project director, Fred Burton, worked with Quentin Bloxam from the Durrell Wildlife Conservation Trust, revisiting locations where *C. n. lewisi* were found at the time of the last surveys in 1992–3.

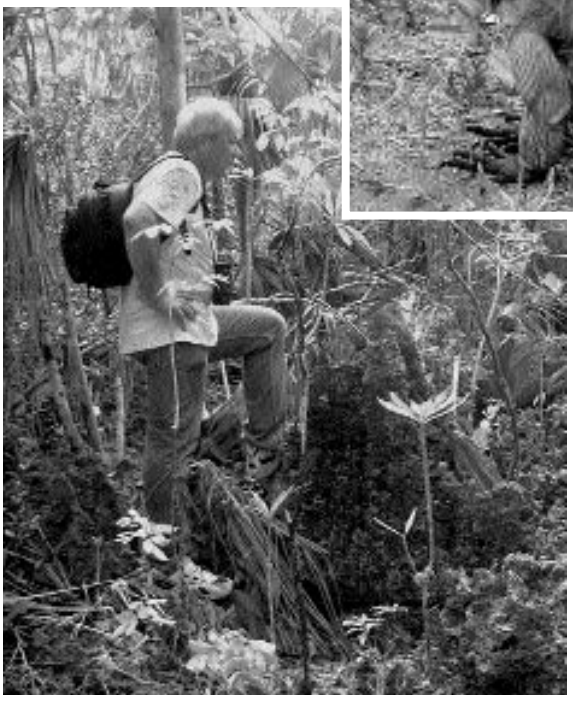
In early June, the second phase will commence; Fred will be joined by Alberto Jaramillo from the Charles Darwin Foundation's Research Station in the Galápagos Islands, Joe Wasilewski of the International Iguana Society, and Joel Friesch from California. The team will survey rarely visited, essentially inaccessible areas in the deep interior of Grand Cayman's East End, covering most of the remaining potential habitat, none of which has ever been assessed.

The work is not without risks. An unlucky combination of circumstances led to Quentin becoming seriously lost one Saturday morning, and the brief planned outing turned into a two-day ordeal and a very close escape from death by dehydration. The surviving *C. n. lewisi* occupy habitat that is, in part, some of the most hostile terrain in the region.

Fred Burton reports on the preliminary survey results: "The news so far is grim, but not without options. What we have done so far is revisit all the sites where wild iguanas were detected in the early 1990s, when we estimated the wild population at 100–200 individuals. Our main study site seems to have but a single survivor; we saw scat and a tail drag but no direct sighting. Domestic dogs are now roaming throughout this area, so we don't have to look far for the cause of this decline. Nearby, in the type locality for *C. n. lewisi*, the more accessible areas appear to be completely devoid of iguanas, although we still need to look further. A third area, which was a traditional stronghold for the species, is gone now. The cumulative effect of the Queen's Highway, which was built along this coast in the early 1980s, has reached its inevitable conclusion, and *C. n. lewisi* is functionally extinct in that area. So, we are looking at an extremely severe reduction in an already tiny range.

However, a single farm right in the middle of the East interior, has yearlings! Breeding is taking place still... We saw two, with clear, fresh evidence of a third, and also corroborative signs to back up the laborers' assessment that seven youngsters and at least two adults are in the area. This is much more active than it was in the 1990s, and the reason is that the farm dogs have been gone for several years. Unfortunately, the owners have a new puppy, so the situation is far from secure. The farm is owned by a local businessman. I chatted briefly with him the other day; he readily gave us permission to study the iguanas there, and I hope we may be able to obtain his agreement to management measures beneficial to the iguanas."

The 2002 survey is a vital step in implementing the major, integrated Species Recovery Plan for the Blue Iguana that was developed by the IUCN Iguana Specialist Group, the National Trust for the Cayman Islands, and local government agencies in November 2001. Based on the results of this work, key decisions will be made toward the conservation of this critically endangered iguana. Clearly, time is not on our side.



A young released male named "Pink" patrolling the chain-link fence enclosing the captive breeding enclosure. *Photograph by Fred Burton.*

Quentin Bloxam in typical East End interior dry scrubland. *Photograph by Fred Burton.*

Brief History of the Captive Breeding Facility

1990 — The project to save *C. n. lewisi* and its habitat was initiated with two adults.

1992 — Friends of the National Zoo began funding field research of the remnant wild population.

1993 — The collection had grown to six adults and 26 hatchlings (the four additional adults were acquired from private holdings on the island). A display enclosure was built with funding from the WWF–UK.

1994 — An adult pair was released with radio transmitters. They remained in the immediate vicinity for a while, but then contact was lost. Problems with breeding were traced to diet. The diet was changed and breeding success improved.

1995 — A wild nest was observed. The Zoological Society of Milwaukee and the Foundation for Wildlife Conservation provided funds for a new facility.

1996 — Further diet changes were implemented and produced better results in breeding. All contact with released animals was lost, probably due to predation by feral cats and dogs or mortality from cars and humans. Because of their rarity, *C. n. lewisi* are considered to be quite valuable in some (illegal) circles, and poaching may occur in spite of stiff penalties in the U.S. The decision was made to restrict further releases to the Botanic Park, close to the facility.

1997 — Eight young were hatched. The Central Florida Zoo provided funding via a grant.

1998 — Breeding success was improving.

1999 — Twelve two-year-olds were released and more hatchlings born.

2000 — Ten captives were released, but captive breeding success was declining and the diet was changed yet again.

2001 — With researchers from the University of Tennessee assisting in the program, 17 young were produced, and some of the released iguanas were breeding. Diet enhanced further with donation of ZooMed® pellets by the International Reptile Conservation Foundation. A Species Recovery Plan was drafted in conjunction with the ISG meeting in Grand Cayman.

2002 — Raised beds were built to grow fresh food for the captive iguanas. A field survey of the surviving wild population in the eastern interior of Grand Cayman is currently underway with initial results showing a continuing decline.

Female *Cyclura nubila lewisi* ("Jessica") at the breeding facility. *Photograph by John Bendon.*

out collaboratively by the National Trust for the Cayman Islands and international partners. The stated purpose of the plan is "to restore a wild population of the Grand Cayman Blue Iguana sufficient to remain viable in the long term."

The first and most essential objective of the plan is to establish a protected area sufficient to support a wild population of 1,000 animals. Surveys of available land and relict populations (as a possible source of individuals in order to broaden the gene pool) are only the beginning of this process. Ownership of parcels of private and public land needs to be determined, and the political, business, and local communities need to become involved in order to provide legislation for better environmental protection and to create an ecotourism plan for the proposed iguana reserve. Most importantly, international fundraising efforts are needed to provide funds for securing the land and, in some cases, restoring habitat.

Other proposed measures include the reintroduction of *C. n. lewisi* in a part of its former range that hopefully will be designated as a National Park on Barker's Peninsula. Ideally, a self-sustaining sub-population of *C. n. lewisi* will be established in Queen Elizabeth II Botanic Park. This would involve ongoing health screening of the current population as well as released animals, habitat enhancements, and feral animal control measures. Several improvements to the existing captive breeding facility also are planned, so that a sufficient number of animals will be available for

restocking and reintroduction. Improvements to nutrition, husbandry, and caging are necessary, as well as recruitment and training of new permanent and part-time staff members. Hopefully, the facility can eventually be used for education with the addition of interpretive signs and volunteers to interact with the public.

As a safeguard against a catastrophic loss of the Grand Cayman population, a captive population will be established and maintained at ISG-approved institutions outside of the Cayman Islands. Zoological institutions involved in this breeding program hopefully will help to support the conservation program financially.

Another critical objective of the Recovery Plan is to institute a long-term education and awareness plan, which will ensure the support of the local community and visitors. A Conservation Education Campaign is planned for 2003 — "the Year of the Iguana." Teaching materials will be produced and a range of retail items will be developed to serve both as fundraisers and to promote awareness. As part of this effort, an attempt will be made to resolve the taxonomic debate on the status of this taxon as a full species (see Malone and Powell, *IT 9 (1&2))* in order to clarify the educational messages.

The final objective listed in the Recovery Plan is crucial to the fulfillment of all the other objectives: to secure sufficient financial, technical, and human resources to implement this action plan.

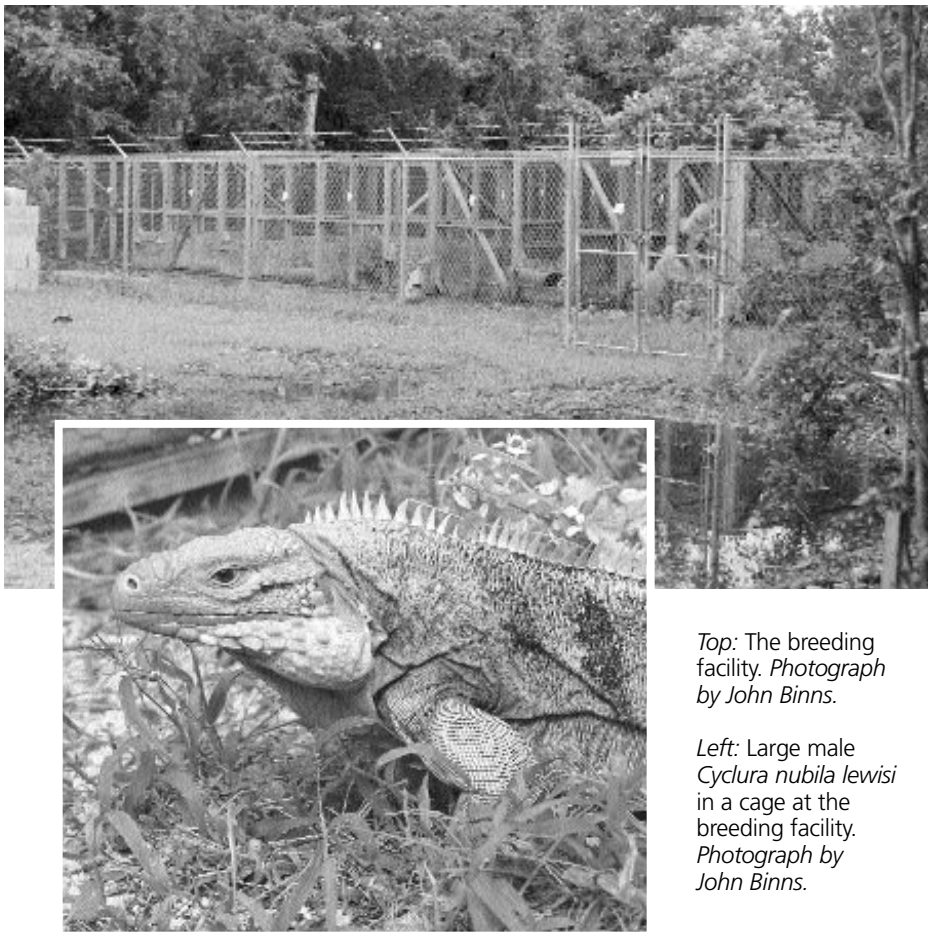
Strengths and Weaknesses

The Blue Iguana is a popular conservation symbol in the Cayman Islands and is legally protected (the Animals Law of 1976). A small breeding and head-starting facility already exists and the restocking of QE II Botanic Park is partially underway with some breeding also occurring in the wild. Field research on habitat restocking, diet, territorial ranges, and nesting ecology has been ongoing for 11 years. Detailed data from comparable studies of *C. n. caymanensis* on Little Cayman also are available.

"I was apprehensive and excited as we turned into the Botanic Gardens. Driving up the dirt road, I observed the lush tropical vegetation. We turned up a road marked 'For Employees Only' and pulled up in a car park. After a walk of a few hundred yards and through another gate, we came to a fenced area in which stood 24 large cages and 15 smaller ones.

Inside these cages sat big, powder-blue iguanas. Powder blue? Yes, powder blue. These were the famed Grand Cayman Blue Iguanas. Blue like you've never seen. I stared in wonder. They each looked up at me using only their eyes as I walked along the aisles. These spiky, heavily jowled creatures were the last of their kind."

— John Bendon, Oct, 2001



Top: The breeding facility. *Photograph by John Binns.*

Left: Large male *Cyclura nubila lewisi* in a cage at the breeding facility. *Photograph by John Binns.*

Reading the PIT tag — these are injected under the skin, allowing for permanent individual identification of animals. *Photograph by John Bendon.*

International support for *Cyclura* conservation from zoos and conservation foundations already exists and hopefully can be sustained. Disturbed habitats with the potential to be restored are available within existing protected areas. The Blue Iguana appears to be adaptable to such man-modified habitats and, with intensive management, these areas should be appropriate for restocking.

On the negative side, the eradication of introduced predators is very expensive, as is land acquisition and habitat conversion. The restocked population at QE II Botanic Park experiences a 60% nest failure rate and outstanding nutritional issues still exist. The facility is somewhat distant from schools and from most volunteers. Without a constant education effort, public interest and concern quickly fade.

Although the Blue Iguana has a high recognition factor, and its name has been used in movies, hotels, and restaurants in many places around the world, one would assume that all of that notoriety would assure the protection and long-range security of the species — but this is far from reality. A case in point comes from John Binns of the International Reptile Conservation Foundation. He recently received an e-mail message from a biology major in the UK, a resident of the Cayman Islands, who had visited Cyclura.com (the website of the IRCF). She was both surprised and shocked to learn that her own endemic species, the famous Blue Iguana, was in fact in serious trouble and heading for extinction.

Field surveys and improvements to the breeding facility are already underway. The diet for animals at the breeding facility now incorporates ZooMed® pellets, thanks to a grant from the IRCF. Raised beds have been planted to grow fruit and native plants. An area has been cleared to accommodate an expansion of breeding cages, and overgrown vegetation around existing cages has been cut back to afford more light penetration (the iguanas' daytime activity periods had been shortened as a consequence of overshading). The Blue Iguana Fund, which has funded a large portion of efforts to conserve *C. n. lewisi* to date, is now exhausted, and further progress will depend on the acquisition of funds.

What Can You Do to Help?

Despite the existence of the *C. n. lewisi* Recovery Plan for restoring viable populations of these animals for the long term, as well as the involvement of the scientific community and other organizations, funding for these efforts is far from secure. "Funding" is often understood to imply that financial resources can be obtained through government and other institutions, whereas, in fact, a good portion of the financial resources

Rick Hudson, of the Fort Worth Zoo, collects an uncooperative iguana for health screening. *Photograph by John Bendon.*

Students Help the Blue Iguana

Science teacher Jennifer O'Brien and the students of Watkinson School in West Hartford, Connecticut decided to contribute the $250 raised from this year's "Jeans Day" to iguana research through the International Iguana Society. Each student "paid" for the privilege of wearing jeans to school, rather than the regular school uniform. The project they chose to support was the effort to save the Blue Iguana, specifically the work of Rachel Goodman. Animals from the CT Iguana Sanctuary, which were brought in to teach the student body about the plight of the Blue Iguana, were received with such enthusiasm that the students later voted to use the iguana as their new school mascot!

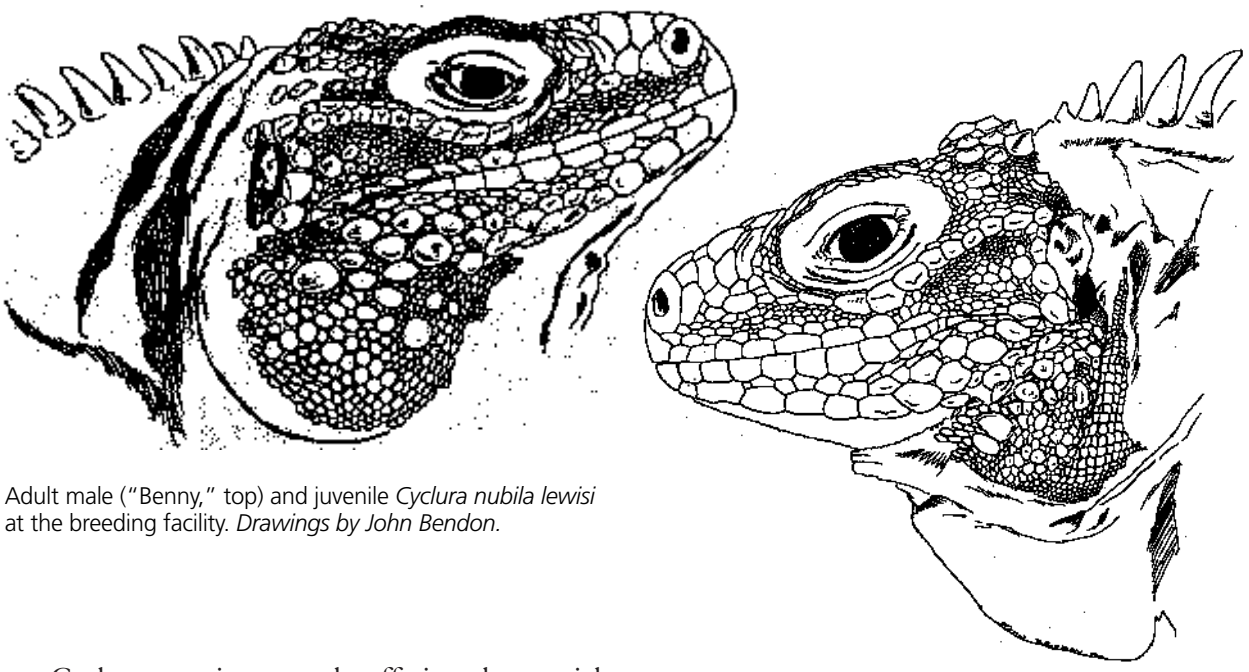
Rachel Goodman is a University of Tennessee graduate student who is actively executing certain aspects of the Blue Iguana Species Recovery Plan. Rachel will be capturing all of the released iguanas at least twice a year to monitor growth. She also will be placing radio transmitters on 10 lizards to map their territories and home ranges and to document habitat use and territorial interactions — all with the intent of determining the *C. n. lewisi* carrying capacity of the 65-acre QE II Botanic Park.

Students from the Watkinson school enjoyed interacting with iguanas from the CT Iguana Sanctuary as they learned about the plight of *Cyclura nubila lewisi*. Sam Sussman (below) holds Castro, a six year old Cuban iguana and Jeff Fink (right) holds Neelix, a four year old female rhinoceros iguana.

Rachel Goodman, a graduate student at the University of Tennessee, with one of the participants of the Blue Iguana Species Recovery Plan.

needed for success of the Recovery Plan will rely on revenue generated from donations, sponsorships, merchandise sales, virtual adoptions, and other similar programs. The development of revenue-generating programs also requires financial and human resources — and these, too, are in limited supply. This, in turn, hampers making such promotions available to the public.

What can you do to help? First and foremost, you must realize that the famous Blue Iguana is in serious trouble and needs the attention of the public in order to bring focus and financial assistance to the recovery effort. Depending on available resources, assistance could include building materials and contractors to aid in the construction of the expanded breeding facility, donations of special food supplies such as the ZooMed® pellets, corporate sponsorships to assist in specific recovery plan efforts, assistance in advertising and promotion of the recovery plan through mass media distribution, sponsoring of volunteers, and a host of other such ideas. Contact names are listed below.



Adult male ("Benny," top) and juvenile *Cyclura nubila lewisi* at the breeding facility. *Drawings by John Bendon.*

Cyclura.com is presently offering the special poster, "Got the Blues," featuring art of the Blue Iguana, mouse pads, and Blue Iguana apparel. Profit from these sales goes directly to the Blue Iguana Recovery Program. Purchases can be made on-line.

Soon to be released is information on a donation program that allows you to have your name or company logo printed in the Official Blue Iguana Recovery Plan and your own hardcopy of the plan. The Recovery Plan details all of the steps in the program, the people involved, the proposed actions, and other pertinent data. This program provides an opportunity to add your name to this important document, signifying your support for a conservation program working to prevent the extinction of a magnificent creature called the Blue Iguana. Please check Cyclura.com for details.

Other programs such as a virtual adoption also are being developed. These will allow you to name a Blue Iguana (for official use in all records) and receive a photograph of the iguana and other information about the animal that you adopt.

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A New Threat to the Utila Island Iguana

AJ Gutman
West Hartford, CT

Dr. Gunther Köhler performed the first modern study of the ecology and reproductive habits of the spiny-tailed iguana of Utila, *Ctenosaura bakeri*, in 1994. Utila is the smallest (42 km^2) of the Bay Islands off the northern coast of Honduras. Only a few hundred specimens were estimated to exist at the time of Köhler's study. The population consisted mainly of adult males, young females, and a small number of juveniles. Unlike *C. similis* and *Iguana iguana*, which also are found on the island, C. *bakeri* is uniquely adapted to living in and on mangrove trees in the swampy areas of Utila. Gravid females that leave the relative safety of the mangroves for nesting sites on the few undisturbed sandy beaches, some up to a kilometer away, fall prey to local hunters. The hunters will plow through the beach sand looking for eggs, which also are at risk from careless visitors who unwittingly step on the shallow nest burrows, crushing the contents.

Subadult *Ctenosaura bakeri* at the Iguana Research and Breeding Station. *Photograph by John Binns.*

The effort initiated in 1994 to protect *Ctenosaura bakeri* was called "Conservation and Research Project Utila Iguana." Initially, the presence of conservation personnel on the island worked favorably for the iguanas. A year-round ban on hunting enforced by a full-time wildlife ranger reduced the hunting pressure and an increase in juvenile specimens was noted in 1995 and 1996. Eventually, however, the employment of hired wardens to prevent iguana hunting proved unsuccessful and iguana hunting continues to be a very real threat.

In 1997, the name of the project was changed to "Conservation Project Utila Iguana" (CPUI), and the Iguana Research and Breeding Station was established on the island, primarily with the support of the Senckenberg Nature Research Society and the Frankfurt Zoological Society. Located on the outskirts of the town of Utila, the main structure of the station is a large, two-story wooden building, which contains a visitor's center, a laboratory, and storage areas as well as living quarters, a kitchen, and bathrooms. In addition to housing the *in-situ* breeding program, the station serves as a base for volunteer conservationists and researchers in related fields. Iguana Station personnel actively participate in town gatherings and also provide local school education programs to teach children about the biodiversity of Utila and Central America and the importance of conserving their natural heritage.

In 1998 and 1999, the Station had variable success with breeding *C. bakeri* and established a program of releasing half of the hatchlings directly into the mangrove thickets and raising the other half for a full year before release to give them a greater chance of survival. Between 1998 and 2000, 237 hatchlings were released into the wild in an attempt to supplement and reverse the decline of the iguana population.

By 2000, the growth of the Conservation Project Utila Iguana was such that Dr. Köhler was unable to handle the entire workload while proceeding with his other research duties. Utila Iguana Rescue Committees had been established in various countries, including the U.S., the Netherlands, and Honduras, and communication between the various groups had become a major undertaking. Sven Zoerner became the new Project Director and took on that job, among oth-

The mangrove swamps on Utila during the dry season. *Photograph by John Binns.*

Nesting area on the beaches of Utila. *Photograph by John Binns.*

The Iguana Research and Breeding Station, Utila, Honduras. *Photograph by John Binns.*

Iguana education at the local school. *Photograph by John Binns.*

ers. He has devoted his considerable energy to updating the Utila Iguana website (utila-iguana.org), moderating on-line discussion groups and participating in Internet Ecotourism Conferences. Sven also handles the administrative paperwork, prepares annual reports, and does long-term planning.

A New Threat

Most Utileños feel that tradition gives them the right to hunt iguanas, and regarding the animals as anything other than a food source is difficult. From the outset, teachers found that neither young people nor adults had any concept of conservation and environmental issues. The Education Officer from the Bay Island Conservation Association, Dolfos Stanley, visited most of the island's schools and found that "many of [the] children had only a limited understanding of the various birds that share [their] island home. They could only identify the most common and knew very little about even these." A volunteer teacher from the Iguana Station brought a frog and a boa constrictor into the classroom only to find a wall of prejudice that needed be broken down. The students knew that none of the snakes on the island were venomous, yet believed that it was impossible that frogs also lived there. This misconception was based on the children's belief that snakes always became poisonous after eating a frog.

Also by 2000, a much greater threat to the iguanas than that posed by the local hunters became evident. A huge new international airport and a multi-lane highway leading into the town of Utila were on the drawing board. To accommodate the anticipated influx of tourists provided by this proposed gateway, new hotels and resorts were an integral part of the expansion plan. Prominently absent in this endeavor were environmental impact studies and development plans, which took into consideration conservation and preservation of the island's biodiversity. Ironically, these are the things that are most attractive to people who are drawn to this small sector of paradise. The environmental impact of uncontrolled development on an island with no waste disposal or fresh water and a power utility plant, which already leaks a substantial amount of fuel oil into the ocean, would be nothing short of an ecological disaster.

Project Utila Iguana

In response to these imminent threats, Dr. Köhler and his associates came up with a plan to minimize the impact of these sudden changes on

the iguana population and their dual habitat of mangrove swamp and sandy beach. The proposal called for a nature sanctuary on Utila located in the prime habitat of Iron Bound and eastern Rock Harbor. Mangrove swamp, rocky coast, beach habitat, Caribbean dry forest, wet savanna, and seasonal dry forest all occur here in close proximity and almost all known vertebrate species on Utila have been recorded in this area. The proposal is outlined on the Utila iguana website and in an article in *Iguana Times* (Vol. 8(2)). An important feature of the sanctuary is the raised walkway, a 4.5 mile eco-trail with specific habitat observation platforms and "points of information" where visitors can learn about the island's biodiversity. The trail would follow an existing path currently traversing several types of habitat, and also would include sites of geological, historical, and cultural significance — and a hopefully thought-provoking view of the dump. The eco-trail, while helping to preserve the habitat of the iguanas, also would educate visitors to the natural riches of Utila, which are virtually unknown to the locals, many of whom believe the swamps are little more than a place where hunters go to collect iguanas, coconuts, and crabs.

Local Conditions

In May 2001, John Binns of the U.S. Committee for the CPUI, visited Utila to carry a load of needed supplies to the Iguana Station and to gather first-hand information about conditions on Utila to better facilitate operations from the U.S. The results were published in a report detailing his observations and making some specific recommendations to enhance the conservation effort. He and colleague Roger Membreno found that

Iguana hunters searching for eggs and iguanas. *Photograph by John Binns.*

Adopt a Swamper Program

An important part of the breeding program at the Research and Breeding Station is to stabilize the natural population and conserve the genetic diversity of a species that has a very limited distribution. Half of all *C. bakeri* hatched at the station are immediately released into the wild. With a virtual adoption, individuals can enable the staff at the Iguana Station to take care of a young iguana for the first year before being released. Mortality amongst the young animals in the wild is extremely high and releasing them once they have reached a larger size gives them a much better chance of resisting predators and other environmental dangers.

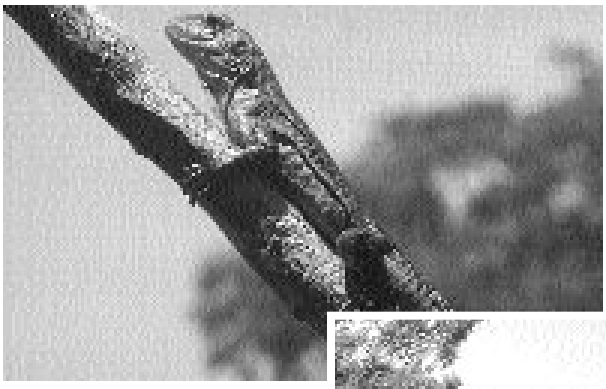
The Iguana Station registers each new iguana that hatches. This includes the hatchling's measurements, hatch date, and ID number. Photographs are taken digitally with a camera supplied by the International Reptile Conservation Foundation. The images are transferred to CD, and then hand-carried by one of the returning volunteers to the U.S. Unfortunately, determining the sexes of the hatchlings is not possible at this time.

If you adopt a swamper for a $25 donation, you will receive an adoption certificate with specific data about the iguana that you are supporting and a photograph of the hatchling. The certificate, suitable for framing, also carries the official seal of the project.

For a $50 donation you also will receive (current offer) either a Utila Iguana poster or a species Data Sheet signed by Gunther Köhler.

For either adoption donation, the parent can name the iguana. This name appears on the Adoption Certificate.

The Utila Iguana Adoption Program originated in Germany, and is currently headed by the Conservation Project Utila Iguana Director, Sven Zoerner (Sven@svenzoerner.de). The U.S. Committee for the project was initiated by Lori King, and currently is being administered by John Binns (jbinns@cyclura.com).



Above: Juvenile *Ctenosaura bakeri* at the Iguana Research and Breeding Station. *Photograph by John Binns.*

Right: Cages at the Iguana Research and Breeding Station. *Photograph by John Binns.*

Above: Gunther Köhler retrieving iguana eggs at the Iguana Research and Breeding Station. *Photograph by John Binns.*

none of the information published by the CPUI prepared them for the "local conditions, social environment, education levels, and customs existing on Utila today. The preservation of the Utila habitats and biodiversity presently hangs solely on the whims of the developers, while hunting of *C. bakeri*, *C. similis*, and *Iguana iguana* continues daily without restriction."

On excursions into the mangrove areas of Rock Harbor and Iron Bound, John and Roger saw nine female *C. bakeri*, and the remains of another that had been killed by hunters at a nest site. They also videotaped hunters carrying bloody bags and each day "heard no less than 5 gunshot sounds coming from the mangrove area or while traversing the mangroves or swamp routes to the beach areas." On one occasion, they were even fired upon by someone hidden in a wooded area while they were about 1/4 mile from the station. Biologist Alex Gutsche, Manager of the Research and Breeding Station in 2000 and 2001, suggested that the increase in hunting may be due to the presence of migrant workers from the mainland. Inexpensive mainland laborers are hired for the construction projects but not reimbursed for boat transportation, or provided with island housing, or sanitary facilities. These laborers live in tents on the outskirts of town and hunt whatever is available for their food using guns, machetes, and string-loops.

A practical-minded conservationist, Binns listed several suggestions to enhance the conservation project. Several of these related directly to improving the relationship with the community. Honduran involvement should be increased by inviting student volunteers from Honduran colleges to participate in various areas of the project related to their studies. Spanish fluency should be a requirement for international volunteers, making them more effective as ambassadors to the local populace. Partnerships with Honduran environmental, conservation, and preservation organizations should be forged, and Honduran teachers and students sponsored to visit the Research and Breeding Station. Given the general distrust with which the people of Utila regard the mainlanders, the report further suggested that a program be developed to present "the negative impact of island development and long term effects on the local residents. Development of the island without careful planning will have severe impact on what the islanders treasure most, the absence of author-

ity, their free-living style, local free enterprise, and their culture." Other suggestions included improvements to the Station itself, providing eco-hikes immediately, and setting up a storefront in town to increase the visibility of the Station and the tours and hikes available.

Nothing, however, is completely straightforward on Utila. Even communications are complicated, with a long waiting list for access to telephone lines and Internet access expensive and monopolized by the Internet Café. Honduran law is complex and difficult enough to navigate in Spanish, much less in English by the Iguana Station personnel who are predominantly native German speakers. Even the term "National Park" is contentious. The protected area must be called a "Sanctuary" or "Nature Reserve," and the application for special status must come from a Honduran organization. The Iguana Station personnel are only guests, known by the locals as the "iguana people," a title in itself suggesting that they are considered outsiders. Lacking residence further isolates them from stronger connection with local organizations and municipal officials to promote partnerships that could effectively manage growth while saving the biodiversity of the island.

The new airport has been open since mid-November and 47 development projects are proposed or already in progress. The proposal for the

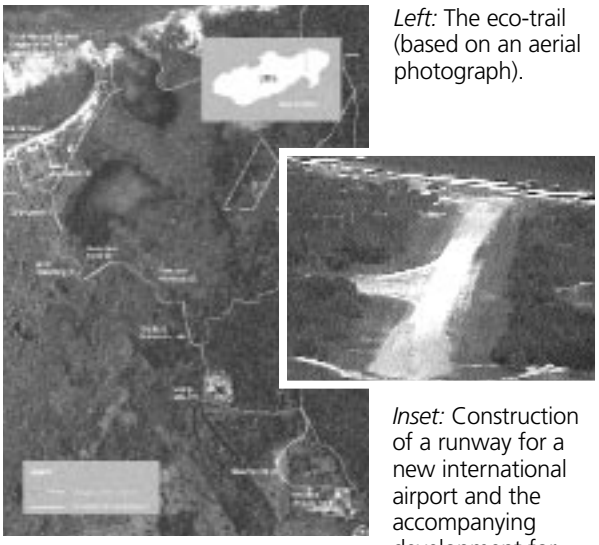
The Frankfurt Hatchlings

AJ Gutman

Since 1999, *Ctenosaura bakeri* have been hatched successfully at the zoo in Frankfurt, Germany. All are descendants of four animals that were taken there in 1998 by Dr. Gunther Köhler. Many of these hatchlings have been returned to Utila and restored to the wild. In August 2001, 20 of the 44 *C. bakeri* that were hatched in June were exported to Mark Malfatti of West Coast Iguanid Research in California. From there, some of the hatchlings were distributed to private breeders and other individuals, who have supported the Utila Iguana Conservation Project. These persons include John Binns of the International Reptile Conservation Foundation and Lori King of the Chicago Herpetological Society. Lori is a long-time supporter of reptiles in general and of iguanas of every stripe, especially *C. bakeri*. Lori also has been a great friend to the International Iguana Society and to me. When she was offered some of the hatchlings, instead of asking for two, she requested three, knowing of my interest in spiny-tailed iguanas and the Utila project. When she called to tell me about the babies, I was simultaneously shocked and deeply honored. I also had Lori in stitches when I told her what I was going to call my little German adoptee. It had to be "Gunther!" All of the people who received these very special iguanas are committed to keeping these animals from entering the pet trade. You can view a few of these remarkable babies live on a web-cam at http://cyclura.com.

After several excursions in a packing box, my little Gunther was happy to settle down in as close to a swamp habitat as I could manage on my kitchen table. Oblivious to the plight of his family on Utila, he still has a tremendous sense of his own importance, as any proper iguana will. When I look at him, he will fearlessly return my gaze. He has the hunting skill, appetite, and table manners of the average Klingon warrior and has been growing steadily. The only noticeable remnant of the German portion of his heritage is a fondness for German children's songs, his favorites being the existential "Horch, was kommt von Draussen rein" and the rather gory "Fuchs, Du hast die Gans gestohlen." A natural showman, Gunther already has been to school to teach young people about the vanishing swamp iguanas of Utila.

Gunther, the lizard (not the person). *Photograph by Carole Saucier.*



Left: The eco-trail (based on an aerial photograph).

Inset: Construction of a runway for a new international airport and the accompanying development for increased tourism poses a serious threat to the remaining iguana habitat. *Photograph by John Binns.*

eco-trail, which was presented to the "Rare Center" in the summer of 2001 for funding, has not received a formal reply. Portions of the land for the proposed trail pass through private land and the Center is reluctant to fund the project unless all the land can be put in a public trust. A British conservation group known as the Biodiversity Trust expressed an interest in purchasing land for their own environmental program. Following an initial investigation by the Trust, $100,000 was set aside for land acquisition, but during the course of the transaction with local land owners, the money disappeared.

In 2001, Stefanie Clauss and Christian Wild, Master's degree students in landscape architecture and landscape planning at the Technische Universität, Munich, spent several months on Utila developing a long-term sustainable land-use plan. Like so many other first-time visitors, they were astonished at how little interest the locals had in environmental issues. They saw first-hand the burning dumpsites, the non-existent sewage system, uncontrolled hunting, and a nature reserve that existed only on paper. Nevertheless, they forged ahead with their surveys. Over 50 different kinds of vegetation were easily identified, many of them influenced by intermittent inundation by salt water. Suggested land use took into account not only the types of vegetation, soil structure, and frequency of saltwater inundation, but also the presence of endangered species and, most importantly, the present and future needs of the community for education, health care, power, waste disposal, and sewage.

Increases in tourism and the number of Hondurans providing related services will increase the likelihood of sights such as this dump. *Photograph by John Binns.*

Hope for the Future

Some hope for the future of the Utila iguana is not entirely unrealistic — despite the restricted distribution of the species, low reproduction rate, the need for two different kinds of habitat, and the increase in hunting. The most recent surveys performed by former Station Director Alex Gutsche indicate a population that is substantially higher than Dr. Köhler's 1994 estimates. He believes that increased education and public awareness, the establishment of a specific protected area, especially during the egg-laying season, and control of the ban on hunting can positively influence the long-term survival of the species.

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The official seal of the Conservation Project Utila Iguana.

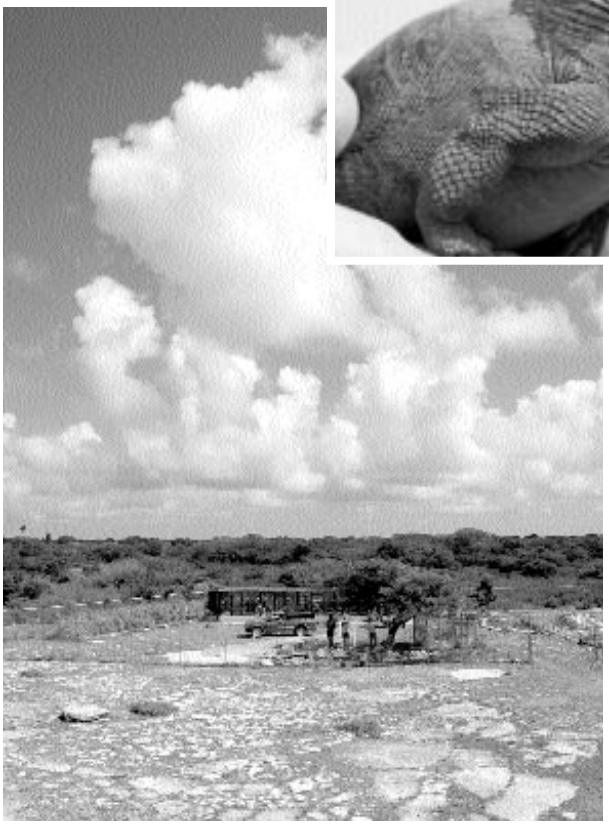
The Anegada Iguana Headstarting Facility

Upgrade Project 25 August–3 September 2001*

John Binns
International Reptile Conservation Foundation
Cyclura.com

In July 2001, during a meeting to draft the five-year Anegada Iguana Recovery Plan, visitors to the Anegada headstarting facility for *Cyclura pinguis* determined that the condition of the facility had decayed since its construction in 1997. Operational procedures and protocols were minimal, and husbandry training of the part-time keepers had stalled. However, the 52 captive juveniles were healthy, albeit showing some signs of dehydration, and, as in other reports, the juveniles remained undersized in all age groups.

One of the older juvenile *Cyclura pinguis*, most likely collected in 1998. These captives remain undersized for their age. *Photograph by John Binns.*



This picture shows the small outpost called the Anegada Head-Starting Facility, which struggles to prevent the extinction of the oldest extant *Cyclura* species. Remote and without communications, operating on a shoe-string budget, efforts go on daily in an attempt to overcome the odds of extinction. *Photograph by John Binns.*

The headstarting procedure involves collecting hatchlings from the wild and raising them in captivity until they reach a size at which they are less subject to predation by feral animals and can be released. Typically, the term for fostering is about two years.

Concern focused on inadequate diet and habitat conditions in the facility and on the need for husbandry training for the keepers. In addition, the headstarting facility was filled to capacity, but the release of young animals into the wild was being delayed by the slow progress of proposed feral animal removal, land tenure disputes, and poor growth statistics. Without adequate housing at the facility or immediate construction of an additional cage system, hatchlings would have to be released with little chance of survival in habitat that had not been assessed. With the remaining number of *Cyclura pinguis* in the wild estimated at less than 200 and identified nests expected to yield up to 60 hatchlings, the potential loss could have approached 30% of the total wild population.

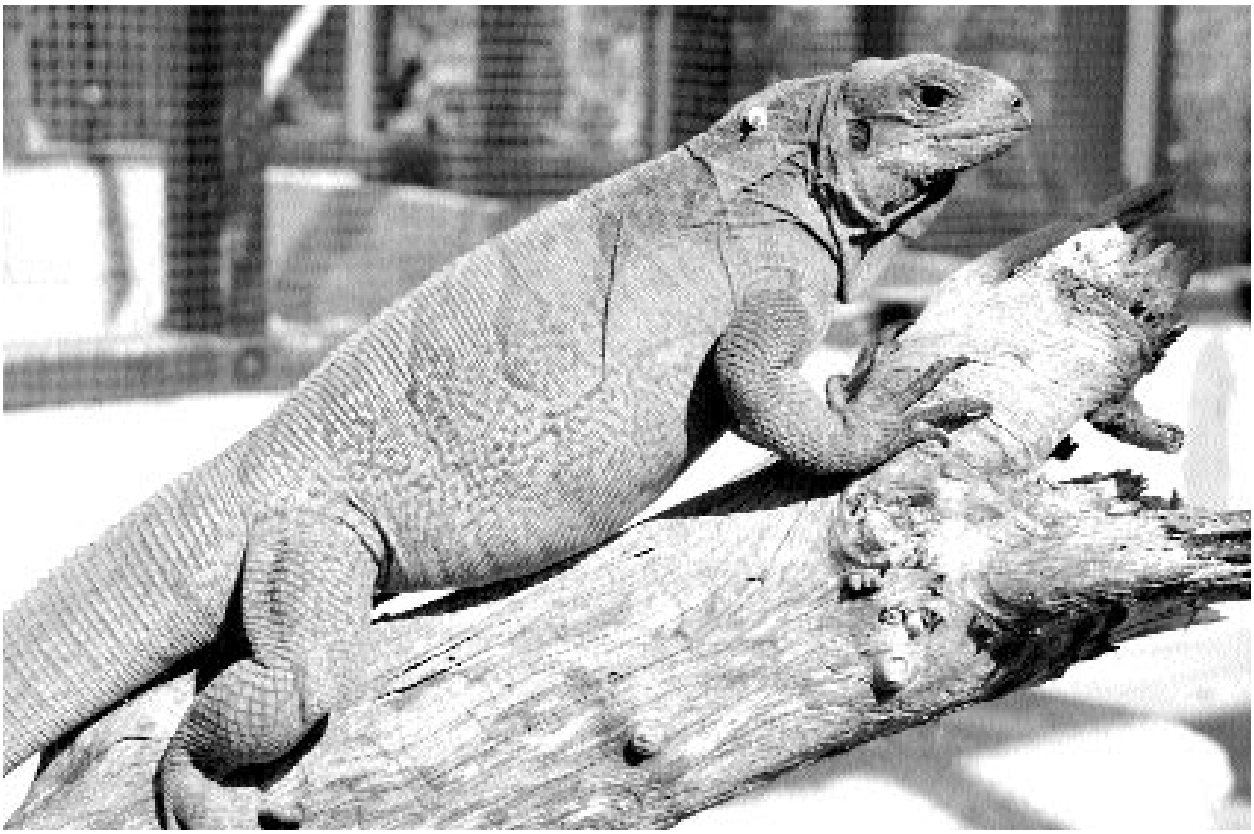
* Adapted from a report published originally in the *Iguana Specialist Group Newsletter* 4(2):12–13.

Sensing the urgency imposed by the combined threats to this species, I assembled a team of individuals to address these conditions in an accelerated timeframe. Funding came from various sources, and Alberto Alvarez from the Mona Island Headstarting Facility provided expertise. The National Parks Trust of the British Virgin Islands provided supplies, two laborers, and full access to BVINPT personnel.

Following our arrival from various parts of the world, work commenced immediately. The team broke into two groups, each with a list of objectives. Juliann Sweet and Sandy Binns were responsible for husbandry training/procedure/protocol, diet, and health. John Binns, Alberto Alvarez, and Joel Friesch focused on construction. BVINPT personnel helped both groups throughout the project.

All objectives of the project were successfully addressed: (1) the diet program was restructured to enhance growth rates; (2) water sources were incorporated within the enclosures; (3) a broad spectrum of husbandry training was provided; (4) cages were subdivided in order to double short-term capacity of the facility to 104 animals; (5) three vegetable boxes with watering systems were built to provide a supply of fresh greens; (6) one new cage was provided to enable animal isolation or hospital utility; (7) all habitats were rehabilitated

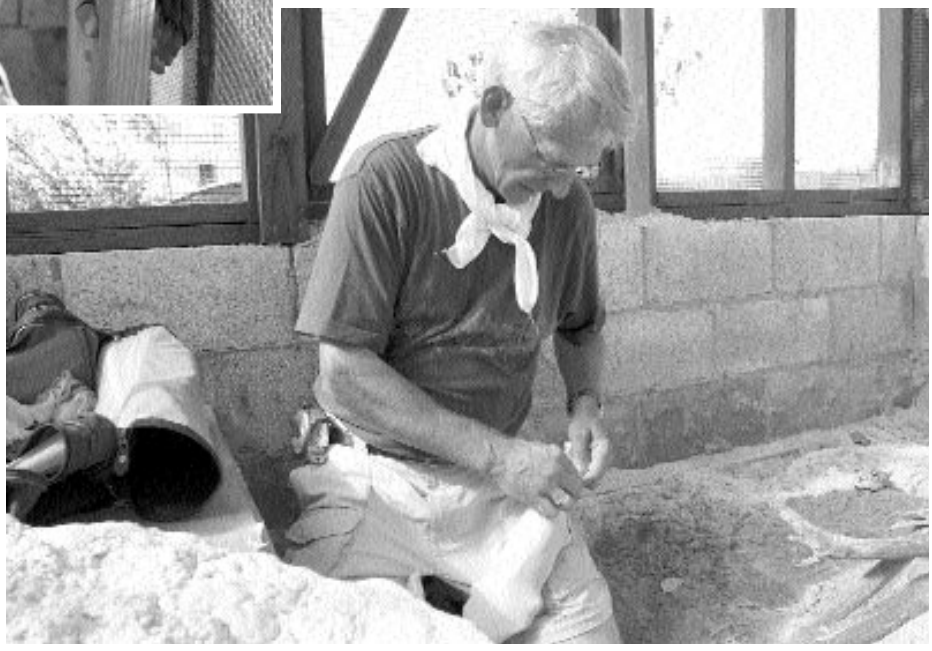
Collected in 2000, this young juvenile again exemplifies the slow growth of the *Cyclura pinguis* at the facility. At the time of this photograph, this animal had not yet been tagged. *Photograph by John Binns.*



One of the largest of the captives (ca. 950 g), collected in 1998. *Cyclura pinguis* on the island of Guana reportedly weigh from nearly two to almost three kilograms (4–6 lbs) at about three years of age. *Photograph by John Binns.*

Team members of the Anegada Head-Start Facility Upgrade Project, July 2001 (from left to right): Dr. Juliann Sweet, Joel Friesch, Alberto Alvarez, John Binns, and Sandy Binns.

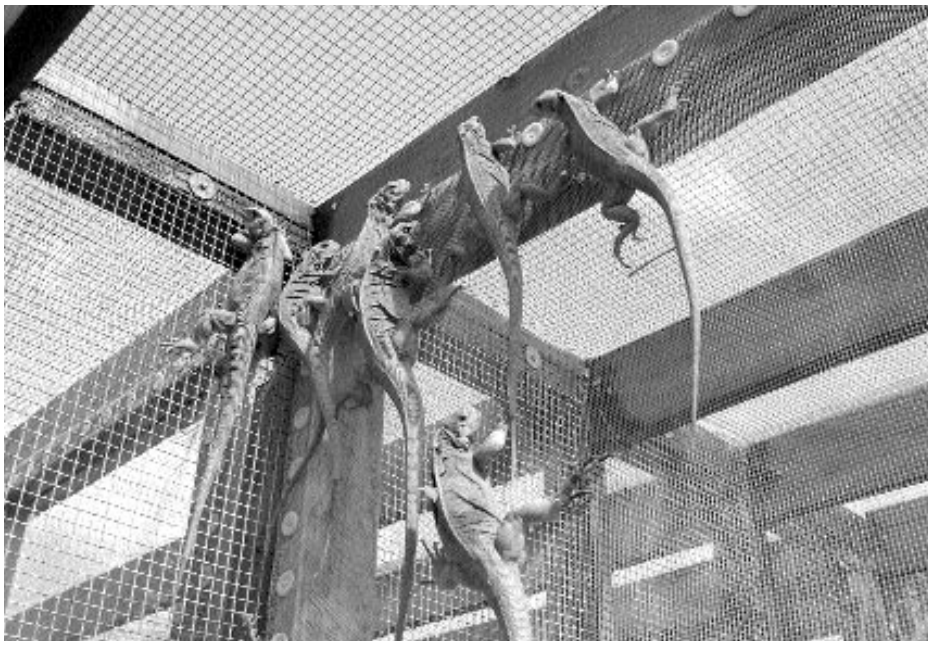
John Binns carefully extracted juveniles from their tunnels and burrows prior to starting reconstruction. The juveniles were placed in surgical socks and placed in a cool area during the day while construction was underway. Each night, the juveniles were returned to their respective cages.



Reconstruction of the cage system. Here Joel Friesch fits a new stud divider to split each large cage into two sections. Alberto Alvarez assists in background. *Photograph by John Binns.*

with large hide-tubes, plants, branches, floor-tubes; (8) existing facilities were repaired; and (9) food plants, cacti for fruit, and trees for shade were planted and a watering system was installed.

During our visit we discovered a new land clearing directly across from a known *C. pinguis* nesting area. The clearing was slightly less than one hectare in size. Not only was the clearing in a protected area known to be inhabited by *C. pinguis*, the land had not first been cleared of animals, but rather set on fire and dozed flat. The number of *C. pinguis* lost in this devastation of habitat is not known. This action was reported to BVINPT.

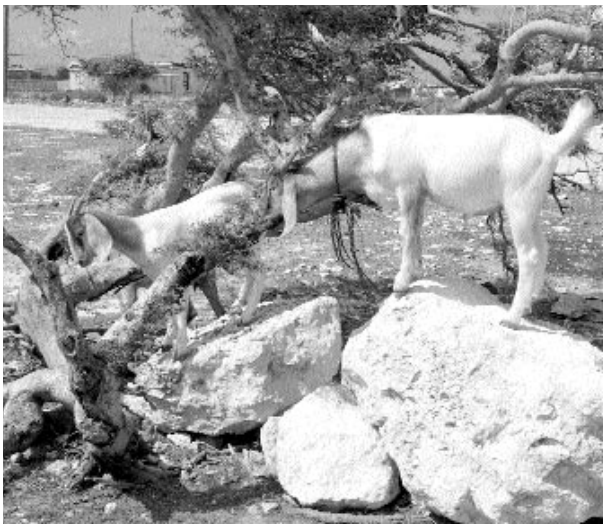


A group of juveniles getting aquainted with the new configuration of the cages. This was a typical sight when we reintroduced animals to their cages. In about two days these captives were establishing areas within the cage and populating the new hide tubes. *Photograph by John Binns.*

Four members of the team also spent a day searching the Eastern End of Anegada for any signs of *C. pinguis*. Iguanas had been reported in that area in the past. Although we covered a substantial amount of ground, no tail drags or other iguana signs were found. We did find, however, heavy concentrations of feral cattle and increases in the numbers of goats as we moved east. These areas were similar to known iguana habitats, but cattle tracks covered much of the ground and livestock had destroyed much of the pristine environment.

Although the Upgrade Project was a success, a visit to Anegada instills a painful awareness of the precarious situation facing the remaining *Cyclura pinguis*. The continuing destruction of habitat by feral cattle and goats, predation on juveniles by cats, and human encroachment into the nesting areas increase daily the likelihood of extinction.

One of the completed sub-divided cages. Sand substrate, plants, large diameter hide-tubes, and climbing branches were provided. Note the burrow box in the lower right corner of the photograph. *Photograph by John Binns.*



Feral livestock, such as these free-ranging goats, consume all available primary food sources over the entire island, leaving only highly toxic secondary vegetation for the iguanas. Prior to the release of livestock on Anegada during the 1970s, the island provided an abundance of plants and fruits for the Anegada iguana, the entire wild population of which now suffers from the effects of a limited food supply. *Photograph by John Binns.*

The second land clearing in the RAMSAR area by an individual interested in staking property before Anegada land tenure issues are resolved. This land was known to support *Cyclura*, but was not cleared of iguanas before being burned and bull-dozed flat. The number of iguanas lost is not known. The area of this clearing is about one hectare. *Photograph by John Binns.*

Anegada sunset taken at the Neptune's Treasure where the Team lodged during our stay. Neptune's Treasure offered excellent service, accomodations, and fully supported our reconstruction efforts, including donations of badly needed supplies. *Photograph by John Binns.*

Epilogue

A year has passed since I initially reported on the upgrade project and, sadly, many of the problems facing this species remain unresolved. The headstarting facility now houses about 80 juveniles, an increase of 30 animals collected after our upgrade effort, but all captives still face a not so-promising future. My work continues promoting protection and survival of this species with researchers, organizations and the BVI National Parks Trust by assisting wherever possible to facilitate conservation efforts. Proactive steps are essential if the problems facing *C. pinguis* are to be addressed before it's too late.

Individuals who admire *Cyclura* need to know that most populations are in decline, with total populations of some species numbering less than 100 in the wild. Considering one local pet store's inventory is about 200 animals, this dramatically exemplifies how few of these *Cyclura* remain and how truly critical their situation is.

If you are interested in donating funds to support the conservation of species such as *C. pinguis*, you can contact the following organizations: International Iguana Society; International Iguana Foundation, or the International Reptile Conservation Foundation. All of these organizations are not-for-profit corporations with the primary mission of preserving iguana populations throughout the world. All donations are tax-deductible.

International Iguana Society:
Contact AJ Gutman.....ctenosara@cyclura.com
International Iguana Foundation:
Contact Rick Hudson...iguanahudson@aol.com
International Reptile Conservation Foundation:
Contact John Binns.....jbinns@cyclura.com

NEWS OF THE SOCIETY

IIS Business

Proposed Bylaws Change

The IIS Board is proposing the following changes in **Article 5: Officers** of the Bylaws of the International Iguana Society. The Board will vote on these no earlier than 1 October 2002 and no later than 31 October 2002. If you have comments on these changes, please contact any Board member.

Existing text:

Section A: Officers and Duties There are four officers which serve the Board of Directors. These are President, Vice-President, Recording and Corresponding Secretary and Treasurer. Officers are charged with the management of the Society. All financial decisions shall be made by the Board of Directors.

Section D: Recording and Corresponding Secretary The Secretary shall keep the minutes of meetings of the Society and the Board and shall be responsible for maintaining those minutes in a form available to members in good standing. The Secretary shall also conduct the correspondence of the Society as directed by the President or the Board and shall be responsible for maintaining records of such correspondence and reporting to the membership and the Board about same.

Section E: Treasurer The Treasurer shall be the custodian of the Society's funds, shall maintain its financial records, and shall present a proposed budget at meetings. The Treasurer shall deliver a report on the status of the Society's funds at the general membership meeting and Board meeting. The Treasurer shall file annual financial reports with the Florida Secretary of State and the Internal Revenue Service. All checks shall be prepared by the Treasurer. The fiscal year shall run from January 1 to December 31 of the next calendar year.

Proposed text (substantive changes are in bold type):

Section A: Officers and Duties Four officers shall serve the Board of Directors: President, Vice-President, **Secretary**, and Treasurer. Officers are charged with the management of the Society. All financial decisions shall be made by the Board of Directors.

Section D: **Secretary** The Secretary shall keep the minutes of meetings of the Society and of the Board and shall be responsible for maintaining those minutes in a form available to members in good standing. The Secretary shall conduct the correspondence of the Society as directed by the President or the Board and shall be responsible for maintaining records of such correspondence and reporting to the membership and the Board about same. **The Secretary shall accept all funds received by the Society and deposit them into the Society's account and shall be responsible for maintaining membership records and records of all deposits into the account of the Society.**

Section E: Treasurer The Treasurer shall be the custodian of the Society's funds, shall maintain its financial records, and shall present a proposed budget at meetings. The Treasurer shall deliver a report on the status of the Society's funds at the general membership meeting and Board meeting. The Treasurer shall file annual financial reports with the Florida Secretary of State and the Internal Revenue Service. All checks shall be prepared by the Treasurer. **All checks for amounts in excess of $100 shall be co-signed by a second person designated by the Board. This person may be an officer or Board member, but may not be the Secretary.** The fiscal year shall run from January 1 to December 31 of **each** calendar year.

Rationale

Providing for internal financial control by having funds accepted and deposited by one officer (Secretary) and all checks and financial records prepared by another (Treasurer) will protect the reputation and financial resources of the Society and of the persons willing to accept the responsibilities of these positions. This is in compliance with standard accounting procedures.

NOTICE

The IIS Board has regretfully accepted the resignation of Carl Fuhri as Treasurer and Janet Fuhri as Fulfillment Coordinator. Both have provided years of faithful service and have graciously opened their home time and again for IIS Board meetings. Carl and Janet will be missed for their dedication and insight and especially for their warmth and unfailing common sense.

The IIS Needs a Treasurer

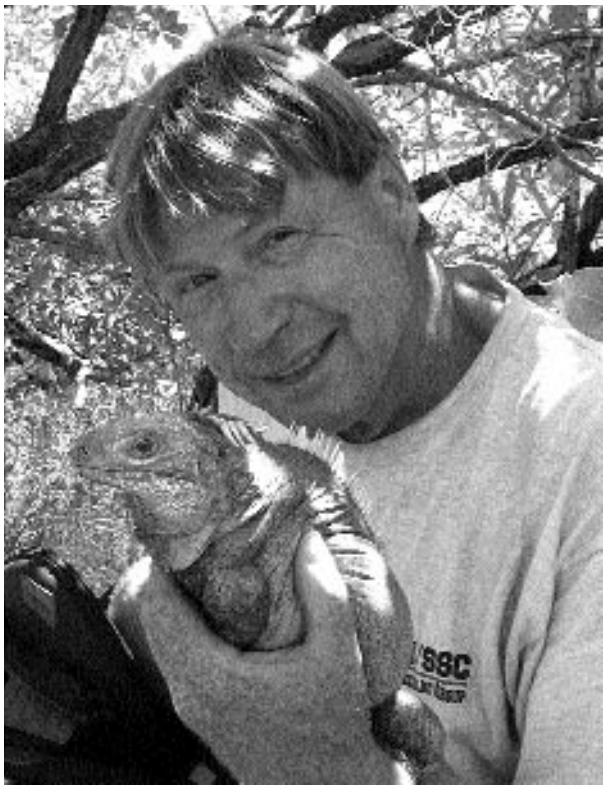
If you are interested in serving the Society as Treasurer and can fulfill the responsibilities listed above, please contact IIS Secretary, AJ Gutman at ctenosaura@cyclura.com

LETTER FROM THE PRESIDENT

The 16 species of iguanas in the genus *Cyclura* are among the most endangered animals in the world. For example, fewer than 100 Jamaican Iguanas, *Cyclura collei,* survive, and the spectacular Grand Cayman Blue Iguana, *Cyclura lewisi,* has an estimated population of less than 200.

Each species is faced with its own set of threats although many are common to all. Habitat destruction is at the top of the list, followed closely by the introduction of domestic animals. The West Indian *Cyclura* are the largest land vertebrates native to the islands. Thus, they have evolved no defense mechanisms against predatory carnivores. Dogs regularly kill iguanas, and may or may not eat their victims. Cats kill and eat smaller, younger individuals of even the largest species. The presence of feral dogs and cats on any island inhabited by iguanas virtually assures their demise.

In historical times, Caribbean islanders have utilized uninhabited islands to place goats for grazing. Goats compete with native iguanas for limited resources; they readily reproduce, and have overgrazed many islands, rendereding them incapable of supporting iguanas.



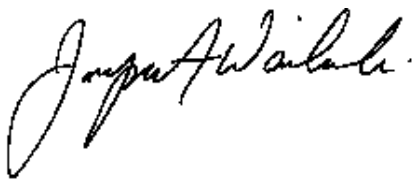
Joe poses with a young *Cyclura carinata bartschi.* Booby Cay, March 2002. *Photograph by John Bendon.*

Poaching for food or the pet trade poses another threat to native iguanas. Sadly, the conservation of endangered species often occurs only in a court of law — rather than in the islands themselves. As recently as 1999, two defendants from the U.S. were convicted of illegally smuggling *Cyclura rileyi, C. figginsi,* and *C. pinguis,* as well as *Iguana delicatissima*., the Lesser Antillean Iguana. No animals as rare as these iguanas are in captivity outside of their respective ranges, thereby automatically defining any of these animals in private collections as illegal.

Where iguanas are hunted for food, local inhabitants often do not understand that these lizards are seriously endangered. Many think that the iguanas exist everywhere and have no idea that some species exist on only a single island! Thus, along with many necessary conservation measures, the only way to ensure the survival of West Indian iguanas is through education. Every school child on the island of Mayaguana (in the Bahamas) has been through a class describing the natural history of the native Booby Cay Iguana, *Cyclura carinata bartschi*. Surveys are presently being conducted on Andros Island (home of *Cyclura cychlura cyclura*) and "Save the Andros Iguana" t-shirts are given to the local people.

Although West Indian iguanas are critically endangered, the future can be brighter. The Iguana Specialist Group of the International Union for the Conservation of Nature (IUCN) has developed an action plan, and many conservation programs are presently being implemented. These are necessary and hopeful signs of progress, but much work remains if we are to ensure the survival of these marvelous animals.

If anyone wishes to support the conservation of iguanas, please contact the International Iguana Society by emailing the IIS Secretary at ctenosaura@cyclura.com or by calling 860-236-8203.



Joe Wasilewski
President, I.I.S.

Adult Utila Iguana, *Ctenosaura bakeri,* Utila Breeding Station Honduras. *Photograph: John Binns*