

# 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)).

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



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.



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 diffi-

culty 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

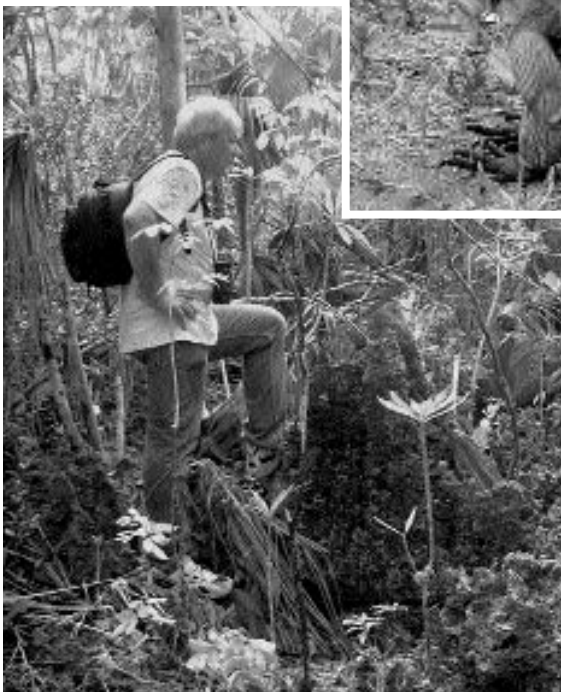
years. Unfortunately, the owners have a new puppy, so the situation is far from secure. The farm is owned by a local businessman. I chatted briefly with him the other day; he readily gave us permission to study the iguanas there, and I hope we may be able to obtain his agreement to management measures 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 eco-tourism 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 jawled 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 overshadowing). 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.

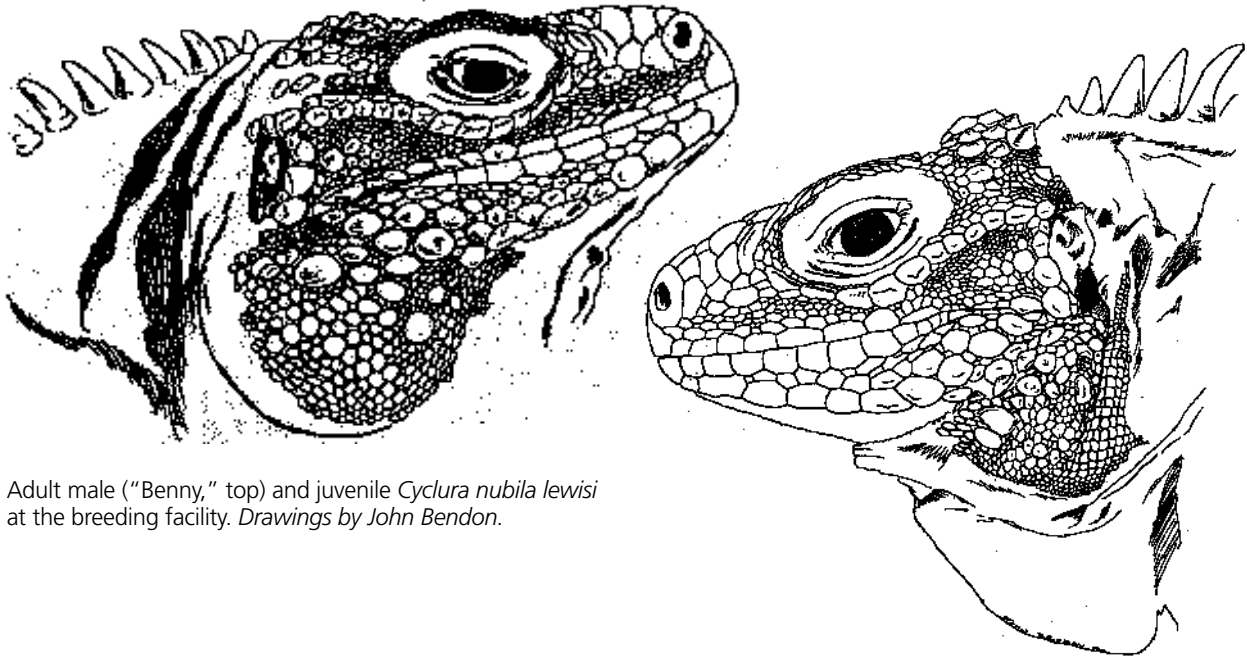
Students from the Watkinson school enjoyed interacting with iguanas from the CT Iguana Sanctuary as they learned about the plight of *Cyclura nubila lewisi*. Sam Sussman (below) holds Castro, a six year old Cuban iguana and Jeff Fink (right) holds Neelix, a four year old female rhinoceros iguana.



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. 

### Contacts for the Blue Iguana Recovery Program

Rick Hudson, Program Officer .....  
.....iguanhudso@aol.com  
*International Iguana Foundation*

Fred Burton ..... fjburt@cantw.ky  
*Blue Iguana Conservation Project, Grand Cayman*

John Binns, Cyclura.com ... jbinns@cyclura.com  
*International Reptile Conservation Foundation*

AJ Gutman ..... ttenosaura@cyclura.com  
*International Iguana Society*

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