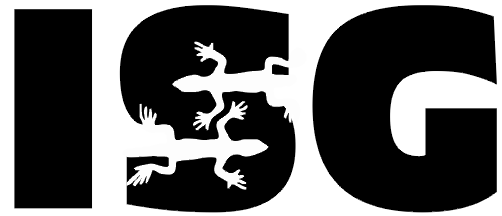


Iguana Specialist Group

Newsletter



IUCN - the World Conservation Union
Species Survival Commission

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Iguanas in the News

Hunters flock to Puerto Rico's remote and rugged Mona Island

Associated Press - June 23, 2003

By Frank Griffiths

ISLA MONA, Puerto Rico. Turning eyes and shotguns toward a rustling bush on this uninhabited Caribbean island, the hunters eagerly await the day's prey. In a flash, a 4-foot (1.2-meter) iguana emerges.

"Darn iguanas!" growls the camouflaged Angel Luis Seda, lowering his weapon in disappointment. "They sound like goats." Set in some of the Caribbean's roughest waters, Isla Mona (Mona Island in English) offers rugged adventure for those looking to hunt, explore caves adorned with petroglyphs, snorkel a pristine coral reef, spot rare boobies, hunt for pirate treasure, investigate a lighthouse designed by Eiffel. For four months of the year, the seven by four mile (eleven by six kilometer) island between Puerto Rico and the Dominican Republic attracts hundreds of hunters from the U.S. Caribbean territory and mainland. They can kill up to five goats a day and any number of pigs, which are rarely sighted. In return, they help protect the island's threatened rhinoceros iguana (*Cyclura cornuta stejnegeri*).

"It's a win-win situation," said Robert Matos, director of natural reserves for Puerto Rico's Natural Resources Department. Biologists estimate the island is home to more than 2,000 iguanas, threatened by pigs, goats, and feral cats brought by farmers in the 18th century. The pigs devour iguana eggs. The cats prey on young lizards. And the goats feast on plants the iguanas eat. In 1999, scientists began catching iguana hatchlings and raising them until they're capable of protecting themselves. About 40 adults have since been released, said biologist Alberto Alvarez, who directs the project.

"This is hostile land," said Seda, one of 75 hunters who came toward the end of the hunting season in March. It begins in December with a month devoted to hunting with bows and arrows. Dubbed the "Galapagos of the Caribbean" for its remoteness and wildlife, the island boasts red-footed boobies, more than 50 species of spiders, endangered

hawksbill turtles, and falcons. Hunters come on a three-hour boat ride made nauseating by choppy water and strong currents to experience a mixture of heaven and hell. Temperatures can soar to 110 degrees Fahrenheit (43 degrees Celsius) in winter, two deadly types of scorpions are indigenous, and dense thorn bushes make Mona hard to navigate. A teenage boy scout died of dehydration in 2001 after getting lost. The same year, a hunter died after his friend mistakenly shot him. Although Seda and companion Victor Padilla know the island well, they carry a global positioning system and, if separated, whistle out before shooting.

“It’s better to scare the animal away than to get shot,” said Leoneides Morina, 45, a shirtless hunter with hands bloody from skinning a goat. The island’s wild beauty makes the challenges worthwhile. Bleached bluffs buttress coral reefs that are a paradise for divers and snorkelers. About 200 limestone caves await explorers, some with petroglyphs from Taino Indians who lived here before Ponce de Leon and his Spanish conquistadors arrived. The caves, some large enough to hold a small cruise ship, once were used for mining guano. Carts and rail tracks still litter some of the larger ones, remnants of concessions granted to companies from Spain, Germany, and Puerto Rico in the late 19th century.

Isla Mona translates to “monkey island” in English, but there never were any monkeys here. It was named for a Taino chief called Amona. Bands of pirates also stopped by, and legend has it that buried treasures abound. The infamous Captain Kidd hid out here in 1699 while England sent word it wanted him executed. Kidd should have stayed. He left for New York, where he was captured and shipped to England for hanging. On the east coast, a cast iron lighthouse in disrepair draws visitors because it was designed by the company of Alexandre Gustave Eiffel, of Eiffel Tower fame, according to Ovidio Davila of Puerto Rico’s Culture Institute. The island was last inhabited in the early 1940s when the Civilian Conservation Corps sent hundreds of people to plant trees in a post-Depression-era program to create jobs. Illegal Dominican migrants trying to reach mainland Puerto Rico sometimes stop here when they encounter rough seas or engine trouble. A graveyard of a dozen or so mangled boats on the west end of the island bears testimony to unsuccessful attempts.

Today, Isla Mona is a remote outpost, visited by biologists, hunters, and tourists who must get permits from the Department of Natural Resources. The only accommodation is a \$4-a-night campsite with dinner, often a hearty goat stew cooked with cilantro and served with rice and beans. Hunters ship the rest of their booty to the main island for sale.

“You alleviate stress with nature,” said Padilla, a 32-year-old auto parts store manager. “This is the life.”



Two dozen endangered iguanas released to wild: feral cats, loss of habitat threaten once-flourishing species

Associated Press - October 11, 2003

THE SETTLEMENT, British Virgin Islands. Scientists have released 24 endangered Anegada rock iguanas into the wild, the culmination of six years of work to protect the rare reptile, scientists said. The iguanas, once a common sight on the sparsely populated British Caribbean island of Anegada, have fallen victim to a



Male Mona island iguana. Photo by Glenn Gerber/ISG Photo Archive.

growing population of feral cats, which eat young iguanas after they hatch. Although there were once thousands of the iguanas living in Anegada, a dry, scrubby island of 15 square miles (39 square kilometers), current estimates put the wild population at fewer than 300. The Anegada rock iguana, or *Cyclura pinguis*, is related to other rock iguanas that live throughout the Caribbean island chain. The World Wildlife Fund lists the iguana as an endangered species.

"This is a very special iguana," said Rick Hudson, biologist with the Fort Worth Zoo in Texas. "The Anegada iguana is the most primitive. All the other rock iguanas evolved from this animal. In terms of preserved evolutionary potential, this is the most important one of the whole group."

In 1997, the territory's National Parks Trust opened a facility for young iguanas where they could be raised until they are big enough to fend off the cats. Started with just three juvenile iguanas, the facility was home to 90 animals before the release Wednesday and Friday. The release was a source of pride for residents of Anegada, who have waited six years to reap the benefits of the facility, a complex of cages located adjacent to the island's government outpost in its only town, called The Settlement.

"When I was a girl, we used to see iguanas all over," said Vanessa Walters, a writer and resident who came to watch the release. "It's really great to see this happening." The two dozen iguanas that were released this week were between three and six years old, said Kelly Bradley, a researcher at the Dallas Zoo in Texas. They can grow to be a maximum six feet (two meters) long and can live up to 80 years. Each animal was surgically implanted with a radio transmitter, which Bradley and other scientists will use to monitor their movements. Next to cats, the iguanas' biggest obstacle to survival is loss of habitat. Although relatively undeveloped, Anegada has lost portions of its untouched interior to grazing livestock. The scientists and several islanders released 12 of the iguanas Friday. One-by-one, the animals were released from pillowcases used to transport them from the facility. The other 12 had been released Wednesday. While some bobbed their heads up and down, others stood still, eyeing their new homes. Gradually, the animals disappeared into the scrubland.



ISG Mission Statement ✨ The Iguana Specialist Group has finalized and adopted a mission statement thanks to the editorial efforts of members Allison Alberts, Kelly Bradley, Karen Graham, Lee Pagni, and the ISG Steering Committee.

The Iguana Specialist Group prioritizes and facilitates conservation, science, and awareness programs that help ensure the survival of wild iguanas and their habitats.

Cuban Iguana PHVA ✨ The Conservation Breeding Specialist Group recently held a Population Habitat and Viability Assessment workshop for the Cuban rock iguana (*Cyclura nubila nubila*). The workshop was hosted by the Havana Zoo in January of 2003 in Cuba. ISG members Ivan Rehak and Tandora Grant attended as did over twenty Cuban biologists and reserve managers from areas throughout Cuba. The Vortex population dynamics model was used to generate extinction risk assessments under current management scenarios based upon information of the natural history, threats, and ecology of Cuban iguana populations and comparable species. Participants drafted detailed management and research recommendations during the workshop. The final report is in the review process and will be published soon.

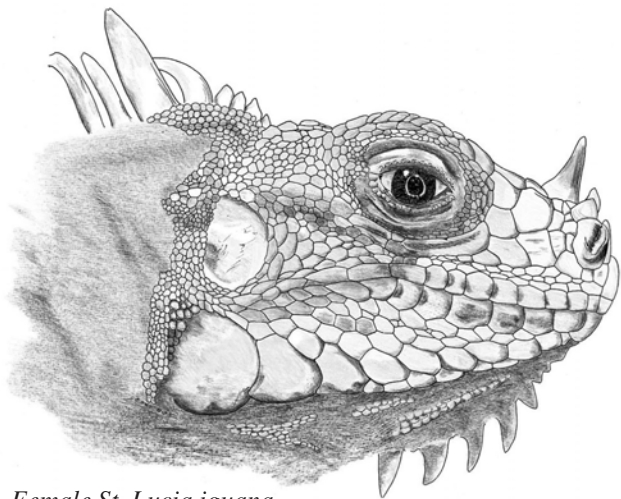


Cuban iguana PHVA participants, Havana, Cuba.

Volunteers needed on St. Lucia ✨ The St.

Lucian iguana project was initiated in 2001 as a partnership between the St. Lucia Forestry Department and the UK-based Durrell Wildlife Conservation Trust to investigate the status of the St. Lucian iguana and implement recommendations for its conservation. As a part of the St. Lucian iguana project's efforts to conserve these impressive animals, we are focussing our efforts on the only two communal nesting areas we have found so far, both located on remote beaches. At these sites we are attempting to develop various methods of estimating population size, as a way of monitoring the success of our ongoing conservation efforts, as well as assessing a number of threats facing the nests, the mothers and their hatchlings.

This is labour-intensive work and we are seeking the assistance of four volunteers to undertake a large component of this vital, beach-based nest monitoring work over a period of 6-7 months in 2004, starting at the end of January, finishing in early August. Unfortunately, the project cannot afford to pay salaries, but all travel and living expenses for four volunteers will be covered.



*Female St. Lucia iguana
from St. Louvet. Drawing by John Bendon.*

The work will involve camping six days a week at these beach sites. In the first phase, lasting roughly three months, volunteers will patrol nest sites through the day, counting sightings of nesting females and the signs they leave indicating their presence. In the second phase, of similar duration, nests will be fenced to catch hatchlings as they emerge allowing us to count and measure them, and make simple health checks, before they are released.

Introduced (non-native) predators at nest sites pose a serious threat to iguanas, their eggs and their hatchlings: volunteers will also attempt to assess these threats through direct observation and live trapping. Trapped introduced predators will be euthanized.

Volunteers will also have the opportunity to develop additional small projects of their own (as examples, both beaches are also nested by sea turtles, especially leatherbacks; both are used by a number of endemic bird species; and there are issues of conservation concern arising from land use practices).

No prior experience is needed, but the work will involve concentration and long hours and all volunteers should be reasonably fit, healthy, and be prepared to camp and prepared to handle iguanas (training will be provided). Preference will be shown to candidates with a track record of having worked on projects in the tropics before, and/or with a background in the biological sciences, but anyone willing and able to undertake this work may apply.

If you are interested, please email: Matt Morton igvol@mmorton.mailcan.com and CC to Karen Graham kgraham@scz.org for further details.



Iguana Book Published ✨ The University of California Press has released a new book entitled: *Iguanas: Biology and Conservation*, edited by Allison C. Alberts, Ronald L. Carter, William K. Hayes, and Emilia P. Martins. The book contains 20 chapters and line drawings by John Bendon.

1. *Iguana Research: Looking Back and Looking Ahead* ✨ Gordon M. Burghardt.
2. *The Evolution of Iguanas: An Overview Of Relationships and a Checklist of Species* ✨ Bradford D. Hollingsworth.
3. *Genetic Contributions to Caribbean Iguana Conservation* ✨ Catherine L. Malone and Scott K. Davis.
4. *The Genetic Structure of the Turks and Caicos Rock Iguana and its Implications for Species Conservation* ✨ Mark E. Welch, Glenn P. Gerber, and Scott K. Davis.
5. *Tracing the Evolution of the Galápagos Iguanas: A Molecular Approach* ✨ Kornelia Rassmann, Melanie Markmann, Fritz Trillmich, and Diethard Tautz.
6. *Sodium and Potassium Secretion by Iguana Salt Glands: Acclimation or Adaptation?* ✨ Lisa C. Hazard.
7. *Behavior and Ecology of Rock Iguanas, I: Evidence for an Appeasement Display* ✨ Emília P. Martins and Kathryn E. Lacy.

8. Behavior and Ecology of Rock Iguanas, II: Population Differences ✎ Ahrash N. Bissell and Emília P. Martins.

9. Sexually Dimorphic Antipredator Behavior in Juvenile Green Iguanas: Kin Selection in the Form of Fraternal Care? ✎ Jesús A. Rivas and Luis E. Levín.

10. Determinants of Lek Mating Success in Male Galápagos Marine Iguanas: Behavior, Body Size, Condition, Ornamentation, Ectoparasite Load, and Female Choice ✎ William K. Hayes, Ronald L. Carter, Martin Wikelski, and Jeffrey A. Sonnentag.

11. Environmental Scaling of Body Size in Island Populations of Galápagos Marine Iguanas ✎ Martin Wikelski and Chris Carbone.

12. Environmental Influences on Body Size of Two Species of Herbivorous Desert Lizards ✎ Christopher R. Tracy.

13. Factors Affecting Long-Term Growth of the Allen Cays Rock Iguana in the Bahamas ✎ John B. Iverson, Geoffrey R. Smith, and Lynne Pieper.

14. Translocation Strategies as a Conservation Tool for West Indian Iguanas: Evaluations and Recommendations ✎ Charles R. Knapp and Richard D. Hudson.

15. Testing the Utility of Headstarting as a Conservation Strategy for West Indian Iguanas ✎ Allison C. Alberts, Jeffrey M. Lemm, Tandora D. Grant, and Lori A. Jackintell.

16. Survival and Reproduction of Repatriated Jamaican Iguanas: Headstarting as a Viable Conservation Strategy ✎ Byron S. Wilson, Allison C. Alberts, Karen S. Graham, Richard D. Hudson, Rhema Kerr Bjorkland, Delano S. Lewis, Nancy P. Lung, Richard Nelson, Nadin Thompson, John L. Kunna, and Peter Vogel.

17. Conservation of an Endangered Bahamian Rock Iguana, I: Population Assessments, Habitat Restoration, and Behavioral Ecology ✎ William K. Hayes, Ronald L. Carter, Samuel Cyril, Jr., and Benjamin Thornton.

18. Conservation of an Endangered Bahamian Rock Iguana, II: Morphological Variation and Conservation Priorities ✎ Ronald L. Carter and William K. Hayes.

19. The Role of Zoos in the Conservation of West Indian Iguanas ✎ Richard D. Hudson and Allison C. Alberts.

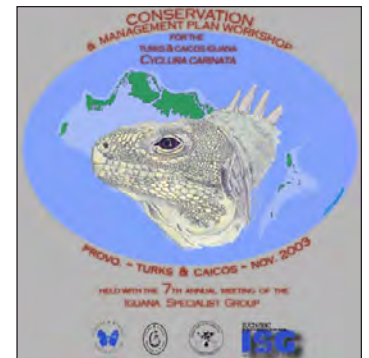
20. Ecotourism and its Potential Impacts on Iguana Conservation in The Caribbean ✎ Charles R. Knapp.



ISG Merchandise ✨

T-shirts designed by Iguana Specialist Group members are available in

all sizes for purchase. Printing of the shirts was the generous donation of Allen Repashy of Southswell ScreenArts. The t-shirt above left depicts John Bendon's Andros iguana. The t-shirt above right was designed by Jeff Lemm and features sparring male Cuban iguanas. Both shirts are ash-gray in color and cost \$15 (\$12 goes to support ISG activities). To place an order, please send checks made out to the International Iguana Foundation to Jeff Lemm, San Diego Zoo, PO BOX 120551, San Diego, CA 92112. There are also a few shirts remaining from the annual ISG meeting in the Turks and Caicos. These shirts are available for \$20 in ash-gray or natural. Please email Glenn Gerber for order information: ggerber@sandiegozoo.org



Mouse pads and posters benefitting the Grand Cayman Blue Iguana Recovery Program are available for purchase online.

Visit <http://www.BlueIguana.ky/shop2.html>



Taxon Reports

Jamaican iguana (*Cyclura collei*)

Jamaican Iguana Conservation Project Field Report 2002

The project team was present in the Hellshire Hills over 200 days during 2002, for 20-plus days per month from February to March (pitfall trap survey), June (nesting season) and September (hatching), and ten days per month in January, May, and December.

Charcoal burning along the trail from Hill Run towards the major iguana area has greatly diminished. However, the increased use of the trail to the west is of considerable concern. Some burners have encroached far south on occasions into natural forest and possibly important iguana habitat. However, their activities are outside the monitoring and control capacity of the iguana conservation group; only proper management of the Hellshire Hills as a protected area will be able to address the problem of charcoal burning in the long term.

Forty live traps were open and baited continuously during most of the year. The traps were closed on December 22 and remained so to the end of the year because regular control was no longer possible due to the death of Mrs. Duffus, the main field worker's wife. A total of 55 mongooses, 15 cats, four dogs and 40 rats were removed. The most northern traps captured the largest number of mongooses, followed by the most southern traps (Figure 1). This suggests that many of the captured mongooses represent immigrants that traveled

along the trail from the north and, to a lesser degree, from the south. Consequently, we are planning to increase the number of traps at these entry points into the major iguana area. Circumstantial evidence suggests that our main bait, red herring, is not optimal to capture feral cats. We will further examine the question of optimal cat bait in experiments carried out by a new postgraduate student, Marlon Osbourne. An experiment using chicken eggs placed in artificial ground nests demonstrated dramatically reduced egg predation in areas where mongooses are controlled. The pitfall trap survey was continued to monitor possible positive population responses of rare species, particularly among the ground-dwelling herpetofauna, to the reduced density of mongooses.

As in previous years, nesting was observed at three sites referred to as Lower (LNS), Upper (UNS) and Secondary Nesting Sites (SNS). The project team could ascertain a total of 12 nests: four at LNS, five at UNS and three at SNS. At least another three females inspected these sites and did some digging, but may have laid elsewhere. Six of the nesting females carried beads. Of these marked animals, five were born in the wild and one was a repatriated headstarted iguana.

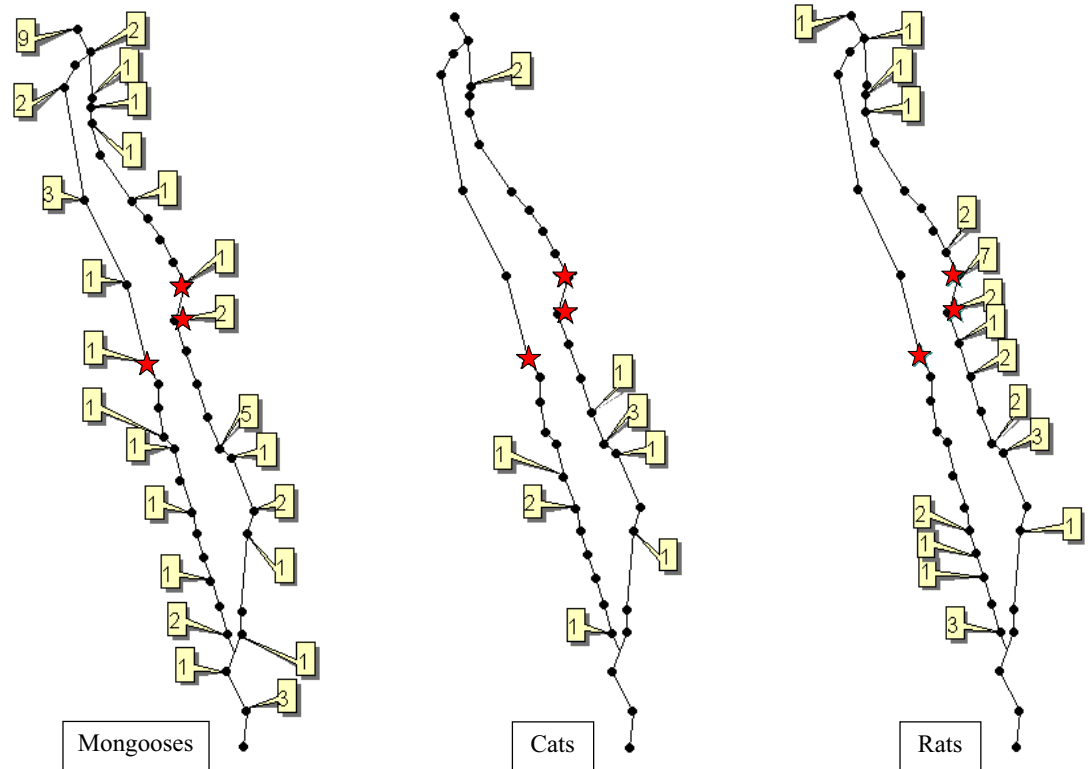


Figure 1. Captures of exotic predators in live traps: January – December 2002. Points indicate trap positions, and stars iguana nesting sites.

Three females observed in 2001 were not recorded in the present year. This was similar to 2001 with four females not recorded that nested in 2000. However, two of these females reappeared and nested at the known sites in 2002. Nesting occurred remarkably late, lasting from June 17 to 30, with a majority of eight (out of twelve) nests from June 20 – 26. In comparison, nesting lasted from June 9 – 23 in 2000, and June 4 – 20 in 2001. Extended periods of heavy rain in late May and early June may have contributed towards the late start in the present.

Expecting similar dates for nesting as in the previous two years, an attempt was made to collect blood samples from spent females and other iguanas from June 11 to 16. However, oviposition had not yet started during this period. Two adult males, both repatriated headstarted animals, and a juvenile iguana could be captured, sampled, and measured.

Table 3 shows the repatriated headstarted iguanas that could be recorded during 2002. Overall, the survival of 10 of the 39 animals released between 1996 and 2001 was confirmed. It was the first record of survival for five of the ten animals. Most remarkably, the female with PIT 9B55 was recorded the first time since her release in 1997, and the male 9404 since his release in 1999. The male 146D was re-recorded the first time in over two years. These figures suggest that survivorship estimates based on current recaptures are conservative. Male C8AC had migrated from the release site in the middle of the Hellshire Hills to the periphery at Hill Run where he was observed by charcoal burner. We recaptured the animal with a live trap and re-released it at the initial location.

Hatching was observed from September 6 to 21. Unusually heavy rain fell during this period lasting

for nearly a week. At total of 80 hatchlings from nine clutches were intercepted, measured, sexed, and PIT tagged. Two hatchlings were found dead in the field. From most clutches, a male and a female were brought to the Hope Zoo. Overall, the Zoo received 19 hatchlings of which three died within the first days. Zoo personnel suspected cool and rainy weather to have contributed to these deaths. All other animals were released where they had hatched.

At the Hope Zoo, six male and five female headstarted iguanas (hatch years 1991-1996) were health-screened in May/June in preparation for their repatriation in the Hellshire Hills. However, definitive results from blood sample analyses were not available early enough for a release in 2002.

The Portland Bight Protected Area, which includes the Hellshire Hills, is still awaiting active management for conservation. Two organizations are competing to obtain management responsibility from the relevant governmental conservation agency. The Jamaican Iguana Research and Conservation Group has collaborated with both organizations and given advice on how to integrate iguana conservation into the management plans. The competition between the two organizations has created an unfortunate delay in the establishment of effective forest conservation. On the other hand, it is encouraging that both organizations appear committed to conserve the iguanas and the remaining natural dry forest of the Hellshire Hills. Also, both groups have endorsed the concept of establishing a wildlife sanctuary on Great Goat Island, that would include the removal of exotic species and the repopulation of the island with iguanas.



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| I.D. No. | Hatch Year | Sex | Release Date | Most Recent Obs. | Minimum survival (days) | Remarks |
|----------|------------|--------|--------------|------------------|-------------------------|------------------------------|
| 0A39 | 1991 | Male | 04/01/96 | 06/14/02 | 2265 | |
| 9B55 | 1991 | Female | 06/01/97 | 08/16/02 | 1902 | First record since release |
| 146D | 1991 | Male | 06/24/97 | 10/31/02 | 1955 | First record in over 2 years |
| ABD4 | 1991 | Male | 02/14/98 | 07/01/02 | 1598 | |
| 9404 | 1993 | Male | 11/19/99 | 04/23/02 | 886 | First record since release |
| E854 | 1993 | Female | 12/01/99 | 06/24/02 | 936 | Nested in 2001 and 2002 |
| E2EB | 1993 | Male | 02/16/01 | 04/03/02 | 411 | |
| C8AC | 1993 | Male | 02/16/01 | 01/22/02 | 340 | First record since release |
| C8F2 | 1994 | Female | 02/20/01 | 08/12/02 | 538 | First record since release |
| 010A | 1993 | Male | 02/20/01 | 03/31/02 | 404 | First record since release |

Table 3. Records during 2002 of repatriated headstarted iguanas

Cuban iguana (*Cyclura nubila nubila*)

Morphometric and Abundance Data for the Cuban Iguana (*Cyclura nubila nubila*) on the Cays North of Carahata, Villa Clara.

Translated/edited from Spanish by Jean-Pierre Montagne and ISG newsletter editors (San Diego Zoo).

Here I describe the morphology and abundance of the Cuban iguana inhabiting the group of cays that form part of the Sabana-Camagüey archipelago, north of the town of Carahata, in Villa Clara province. Three of the largest cays, Verde, Obispo and Sotavento (61, 1458, and 1832 hectares respectively), are nearly 100% covered by mangrove forest, predominantly red mangrove (*Rhizophora mangle*). These cays have small strips of land, between two and five ha, with sandy substrate and typical coastal vegetation. It is in these small sandy strips where the iguanas and their burrows are predominantly found.

The morphological measurements of 19 adult males and 11 adult females from Cayo del Obispo were taken during March of 1999. Following Perera (1984), SVL, tail length, femur length, and head width were measured with calipers. Density (iguanas/hectare) in sandy habitat was estimated by indirect burrow counts, according to the formula:

$$D = D_R \times U \times 0.5$$

Where: D = Density of iguanas/ha
 D_R = Density of burrows/ha
 U = Percent utilization of burrows
 0.5 = Correction factor, since adult iguanas use two burrows on average

To estimate iguana density, burrows were counted twice per year during 1998, 1999 and 2000, before and after the reproductive season. The density of burrows can be estimated by sample plots or transects (Berovides et al, 2001). In this work we used the plot method, with dimensions between 0.45 to 1.00 ha, depending on the size of the sandy strip. Within each plot all the burrows were logged and classified as active (in use) or abandoned.

Table 1 presents morphometric data for Cayo del Obispo. These values were slightly lower than the ones recorded in southern populations on Cayo Farito by Perera (1984), for Cayo Largo by González et al

(2001), and for Cayo San Felipe by Berovides et al (2001). Differences between northern and southern populations may represent natural variation within the species across its geographic range.

Stability in iguana abundance over three years is evident from Table 2; within each cay, densities were maintained with little variation during the three years of study. Differences observed between the cays corroborate the subjective estimates of fishermen who claim that Obispo has abundant iguanas, while Sotavento has few. Similar and comparably stable

| Variables | Males (N = 10) | Females (N = 11) |
|-------------------|-----------------|------------------|
| | mean ± S.D. | mean ± S.D. |
| Snout-vent length | 302.40 ± 48.01 | 258.63 ± 40.58 |
| Tail length | 359.60 ± 109.69 | 310.00 ± 92.84 |
| Femur length | 50.00 ± 4.08 | 45.27 ± 6.15 |
| Head width | 37.20 ± 4.56 | 33.27 ± 4.4 |

Table 1. Morphometric data (mm) for the Cuban iguana on Obispo Cay, Sabana-Camagüey Archipelago.

| Cays | Density (individuals/ha) | | |
|-----------|--------------------------|------|------|
| | 1998 | 1999 | 2000 |
| Obispo | 22.5 | 25.2 | 24.9 |
| Verde | 18.2 | 17.2 | 10.5 |
| Sotavento | 14.2 | NE | NE |

Table 2. Mean densities (iguanas/ha) for the Cuban iguana on three cays of the Sabana-Camagüey archipelago, over three years. Mean values based on two counts per year. NE = Not evaluated

| Cays | N | Entrance height (cm) | Entrance width (cm) |
|--------------|----|----------------------|---------------------|
| | | mean ± S.D. | mean ± S.D. |
| Obispo | 30 | 7.62 ± 1.61 | 13.33 ± 4.02 |
| Verde Zone A | 30 | 6.05 ± 2.99 | 14.43 ± 5.93 |
| Verde Zone B | 28 | 5.89 ± 2.28 | 14.85 ± 5.14 |

Table 3. Dimensions of sand burrows excavated by the Cuban iguana on two cays in the Sabana-Camagüey archipelago.

density values were recorded by Berovides et al (2001) for iguanas of the San Felipe Cays; this is the expected result from a K selected species such as the Cuban iguana. Although these estimates are indirect, a few direct counts of iguanas give similar results.

Mean and variance of burrow dimensions are presented in Table 3. Compared with those recorded for iguanas of San Felipe (mean height 8.9 – 9.6 cm; mean width 19.5 – 22.8 cm), these values are below average. If we assume that the size of the burrow reflects the size of the animal (Cubillas and Berovides, 1991), this would be the expected result, because the average size of iguanas in Cayo del Obispo was less than that of the San Felipe Cays. This indicates that the recorded small size is not an artifact of sampling, and that this effect extends to other cays (the burrows

were also small in Cayo Verde, where no evidence of microgeographic differentiation was demonstrated).

The percentage use (active burrows) we recorded (69.3%) also seems to be a stable between iguana populations (perhaps a reflection of stable densities). Berovides et al (2001) recorded percent usage values of 68.0% for the cays of San Felipe and 69.2% for Cruz del Padre Cay, north of Matanzas.

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Cuban iguana at Guantanamo Bay. Photo by John Phillips.

Anegada iguana (*Cyclura pinguis*)

Population Assessment 2003

The Iguana Specialist Group conducted a population assessment of *Cyclura pinguis* (Stout Iguana) on Anegada Island, British Virgin Islands between June 14th and June 29th. The International Iguana Foundation (IIF), participating institutions, and private contributions by John Binns, Joe Burgess, and George Waters, funded the survey. Members of the survey team were: Dr. Glenn Gerber (San Diego Zoo/ISG), Kelly Bradley (Dallas Zoo/ISG), John Binns (International Reptile Conservation Foundation /ISG/International Iguana Society (IIS)), Roberto Maria (ZooDom/ISG), Tarren Wagener (Ft. Worth Zoo), Joe Burgess (ISG/IIS), George Waters (IIS), and Lee Pagni (San Diego Zoo/ISG). Lee Vanterpool (National Parks Trust, BVI/Head Headstarting Keeper) also assisted in the survey. Sallie Davis, a member of an archeological team conducting research on the east end of the island, assisted the team during one of the survey days.

Due to numerous travel delays, the survey team members missed the last flight to Anegada (scheduled flights are every other day) forcing a layover in Tortola. At midday on June 15th, the team caught the local ferry to Anegada. In retrospect, the ferry was a blessing given the large collection of equipment, baggage, and supplies that would have been expensive and difficult to transport in the small plane to Anegada.

After arriving and settling in our temporary quarters, the team assembled to discuss strategy for the survey task that lay ahead. Anegada is approximately 161 m long and 2-3.5 km wide (about 39km²). Though not a large island, it presented a significant challenge to the small team's ability to conduct a complete survey in the limited amount of time available. Glenn's strategy focused on the western half of the island from Loblolly in the north, to the Settlement in the south. This included Low Cay, Middle Cay, the peninsula east of Middle Cay, and Windberg Cay in the central ponds. Any remaining time would be used to survey the area between the ponds and southern developed coast, and areas east of the Settlement. Given our time constraints, Glenn decided to use data from previous east end surveys conducted by teams led by himself and John Binns in 2001 to round out the population estimate.



The 2003 *C. pinguis* population survey team. Back row: George Waters, Glenn Gerber, and John Binns. Front row: Roberto Maria, Kelly Bradley, Tarren Wagener, and Joe Burgess. Lee Pagni not shown. Photo by Tarren Wagener.

Lee Pagni pitched in periodically to assist in the survey efforts but his primary agenda involved conducting interviews with the local residents of Anegada to assist in formulating a public awareness and school educational program focusing on iguanas.

With game plan in hand, team members began the huge task of surveying the island with energy and enthusiasm, which they maintained throughout. Each morning, the team assembled and headed out to their designated transect areas, armed with GPS, notebooks, binoculars, transceivers, and survey material, to battle dense bush and cacti in 100+ degree heat or an occasional rain squall. Around noon each day, the team reassembled for lunch and a discussion of sightings or the lack of them. The afternoon shift began after a short rest and typically ended about 7 PM when the

weary team headed back to quarters to prepare the evening meal.

In general, the status of *C. pinguis* remains critical and the species appears to be in continued decline. The core iguana areas, Bone and Windlass Bight, now contain bulldozed access cuts, which were determined to have destroyed a number of known iguana burrows. Citron Bush, the site of Michael Carey's research in 1968, which described healthy populations of *C. pinguis*, was heavily disturbed by feral cattle and goats and devoid of any trace of iguanas. Overall, both sightings and signs of *C. pinguis* were low. This was especially disappointing to those team members who had never seen these magnificent animals, having traveled so far and worked so hard without catching more than a fleeting glance of a disappearing shadow.



One of the few photographs of *Cyclura pinguis* taken during the survey. Photo by Joe Burgess.



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Anegada Iguanas Released

The conservation and recovery program for the Anegada iguana, *Cyclura pinguis*, reached a milestone in October 2003 when the first group of 24 headstarted iguanas was released into their native habitat on Anegada. These represent the first releases since the headstarting program got underway in 1997. Of significance is that the program has finally come full-circle in that two of the first three iguanas collected as hatchlings for headstart were released six years later. Animals for release were selected based primarily on size, and are believed to be large enough to survive cat predation in the wild. Released iguanas had an even sex ratio and were equally divided between two size classes, averaging 1,005 g and 1,345 g, respectively (total range: 800-2000 g). The iguanas were released into two very distinct habitat types: twelve (six from each size class and sex) were released in the sandy scrub of Bones Bight, while the other twelve were released in the interior broken limestone woodland of Middle Cay. Both release sites are within the core iguana area and contain some of the best habitat remaining on Anegada.

These iguanas had previously undergone rigorous pre-release health assessments in April 2003 by a veterinary team from the



ISG members and Anegada residents collaborated in the release of headstarted iguanas. Photos by Rick Hudson.

Fort Worth Zoo, with funding from the Morris Animal Foundation. The team then returned in September to surgically implant temperature-sensitive radio transmitters in all 24 iguanas selected for release. The

iguana's locations and behaviors were recorded daily by direct observation for the first 24 days after the initial release by Kelly Bradley (Dallas Zoo) and Jeff Lemm (San Diego Zoo). Kelly will continue to periodically monitor their survival, growth, and general health over the next two years. In addition, a remote data-logging telemetry station was installed to continuously record body temperatures of the released animals to determine thermoregulatory patterns. With the exception of two losses, the iguanas appear to be settling in well and adapting to life in the wild. During Kelly's second visit she managed to recapture the remaining iguanas for data collection and visual inspections. All the iguanas from the Middle Cay site exhibited a significant weight gain (average 136 g); with the exception of four individuals, the animals at Bones Bight had also gained weight (average 46 g).

The releases were an event that enjoyed popular support by a host of local observers, staff, and volunteer participants. In fact, all of the local attendees, including the Anegada District Officer, actually participated by personally releasing iguanas. On hand



were Joseph Smith Abbott, Raymond Walker, Rondell Smith and Clinton Vanterpool (BVI National Parks Trust), Lucia Frances and Shirley Walters (both local residents), Denise Dudgeon (UK Foreign Common-

wealth Office), Dick Beales (UK Dept. of International Development), Malcolm Kirk (BVI Governor's Office), Lee Pagni (San Diego Zoo), Joe Wasilewski (Intl. Iguana Society) and Rick Hudson (Fort Worth Zoo). The event was covered locally in the BVI newspapers; international coverage included CNN.com and Associated Press.

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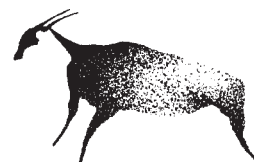
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