



2003 ISG Meeting—Providenciales, Turks & Caicos Islands

ABSTRACTS

Allen's Cays Iguanas, *Cyclura cyclura inornata*: Summary Report for 2003

Field work this year was confined to a single trip (14–21 May 2003), during which we captured 214 iguanas on Leaf Cay (95% of them recaptures!) and 102 on U Cay (93% recaptures). We have made 4543 captures over the 24 years of this study. Leaf Cay probably supports at least 600 iguanas, and U Cay perhaps 300. The pattern of most captures being made on the big west beach of Leaf Cay continued, with 58% being made there (154 of 350 or 44% last year). The profound attraction of the iguanas to the tourist feeding beach cannot be denied. A female U Cay iguana (marked there first in 1992, now 18.7 years old, and last observed nesting on 7 July 2002) was discovered on the streets of Nassau on 3 May 2003.

We also captured seven iguanas on Allen Cay (57% recaptures), including a large male originally marked on Leaf Cay in 1998, and last caught on Leaf Cay last May. We also had captured a marked male from Leaf Cay on Allen Cay last year. Excluding the two relocated males on Allen Cay, in the past three years we have captured a total of five females and six males there. The population may number between 15 and 20 based on our subjective walking censuses. In addition, a possible sighting of a juvenile suggests that, although upland sandy areas are absent, at least one female may have found a suitable nesting site. Barn Owl predation (and possible iguana predation) on shearwaters remains a concern.

We also briefly visited Flat Rock Reef Cay, north of Leaf Cay, and confirmed that at least 15 iguanas are present on this



Allen's Cays Iguana (*Cyclura cyclura inornata*). Photograph by Lynne Pieper.

newly colonized island. Although extremely wary, we observed juveniles and captured three lizards, including a large male originally marked on Leaf Cay, and last captured there in March of 1996. Because of the distance and local currents, this animal was certainly moved there by humans.

Of ten large (>40 cm SVL) males captured last May on the big west beach of Leaf Cay, we captured only six this May. The disturbing, ongoing pattern of disappearing large males on Leaf Cay continues. We suspect that “tourists” may be relocating large, “aggressive,” nuisance male iguanas from the primary tourist feeding beach on Leaf Cay to other cays.

Iguanas in the Allen's Cays clearly are being increasingly disturbed by humans through translocation, overfeeding, and likely poaching (for the food and/or pet trades). As we recommended in last year's report, a desperate need exists for the construction of an “iguana information kiosk” on both Leaf and U cays. Not only could this provide general natural history information to interested tourists, but it could also explain the dangers of harassing, improperly feeding, and relocating the iguanas, as well as the potential threats presented by feral animals.

We continue to implant PIT tags as time and money permit, and have now PIT-tagged a total of 506 lizards. We had three PIT tag failures this year (i.e., the tags were palpable under the skin, but transmitted no signal) and one in which we could detect no signal but also could not palpate the transponder. We also noted that a few PIT tags injected in previous years had migrated ventrally along the body wall from the site of injection. This misled us in past years into thinking that the tag was missing/non-functional in a few individuals, when it was, in fact, still present. As a result, at least two iguanas now have two pit tags. In general, the failure rate of PIT tags is quite low, as is the failure rate of toe clips due to natural toe loss. The combination of the two methods is optimal for our study populations.

Although we had intended to spend mid-June to mid-July again this year in the Allen's Cays monitoring the iguana nesting season for a third year, family health issues prevented that. However, the results of our two-year nesting study are in press. We will return in May 2004 for another census, and we are planning long-term to repeat our nesting study in the summers of 2008–2010.

John B. Iverson

Department of Biology, Earlham College, Richmond, Indiana

The Blue Iguana, *Cyclura lewisi*, Recovery Programme, Grand Cayman: Summary of Progress for 2003

Detailed quarterly updates on the Blue Iguana Recovery Programme have been circulated by email to ISG members and the wider public, with back numbers available on request (email: fjburton@candw.ky). This document is a summary of the period from December 2002 to November 2003.

Protected habitat.—With the imminent release of approximately 25 subadult *C. lewisi* hatched in 2001 into the QE II Botanic Park, that 65-acre property would be supporting its maximum carrying capacity. This means subsequent releases should be directed at restocking or reintroducing animals into a new area.

Discussions have been held with the Cayman Islands Government, which in 2003 acquired a 295-acre land holding in East End Interior, within the recent historic range of *C. lewisi*. The land, which is a working farm with areas of uncultivated shrubland and some wetland forest, was purchased as an extension to the local prison's farm, and as the site of a future wilderness rehabilitation center for minor offenders and low risk long-term prisoners. The Ministry responsible for the prison service has reacted positively to the suggestion that the land could also serve as a site to support a second wild, managed population of Blue Iguanas, involving the prison inmates in associated conservation work.

Realization of this possibility will depend mainly on accessing the substantial funds that will be needed to effectively protect this site from roaming dogs and feral cats, both of which are abundant in this area. An extensive predator exclusion fence will be required, followed by an intensive cat and dog eradication effort.

Programme staffing.—Funds from IIF and a local corporate source allowed the program to hire its only paid staff member, Ms. Desiree Ebanks, in January 2003. Ms. Ebanks has been working 4 h/day, 6 days/week caring for the rapidly expanding captive population. As a result, for the first time in many years, we are able to feed the captives a diet dominated by wild food, collected daily from sites around the island.

With the dramatic increase in the captive population in 2003, Ms. Ebanks' working hours must be increased, with corresponding demands on project funding. F. Burton has continued to direct the programme on a full-time voluntary basis throughout the year. Craig Pelke, area supervisor at the Milwaukee County Zoo, visited Grand Cayman for two weeks under a funding scheme from his zoo to assist in the field with the Blue Iguana Recovery Program.



Grand Cayman Blue Iguana (*Cyclura lewisi*). Photograph by Fred Burton.

Overseas, voluntary and professional support has continued to flow from many individuals in the ISG and IIF networks.

Volunteer assistance has surged, ranging from weekend work parties painting new breeding pens through service club assistance to major corporate participation. Prison labor also has been used extensively.

Captive breeding and head-starting.—A total of 86 *C. lewisi* were successfully hatched from incubated eggs on Grand Cayman in 2003. Of these, 32 are captive-bred; the remainder was hatched from eggs laid by the released, managed population living in the QE II Botanic Park. The latter were collected for head-starting. Survival is almost 100%.

The resurgence in captive breeding success was attributed to improved diet (see above) and improved space. Two new founders bred well, providing important genetic stock, some of which is destined for breeding loans to US facilities. The large boost in numbers from QEIIIP wild nests reflects increased nesting surveillance, and the increased output from the Park's growing females. The age profile of the released population is still very young (max. 8 years old), so the output from this population is expected to continue to climb.

The breeding facilities expanded by four large breeding pens (36 x 48 ft), into which the large adult breeders were moved (one pair per pen) in March. The iguanas' physical condition improved visibly after the move and pairs that did not breed last year, resumed breeding. However, two key males (Hal and Billy) remained infertile, the former only beginning to recover from severe chronic malnutrition during a period of illegal captivity, the latter possibly lacking the stimulation of seeing other males during the breeding season.

A second phase of expansion of the breeding facilities commenced in July, with construction of more hatchling cages, site preparation for small adult breeding and holding pens, and a contained area for hatchling and second year cages. When this work is complete, the facility will be able to manage 100 new hatchlings per year (which will be head-started for two years before release) and sufficient adult holding space for current and projected needs.

Two new potential founders were captured from the wild in 2003, both young animals (one hatched in 2002 and one in 2003) were found in situations where continued survival in the wild was unlikely.

Stephanie James (Wildlife Conservation Society) visited during the year to health-screen animals destined for release as well as selected adults. Preliminary results confirm that the releases are safe to go, and the health of the captive population is generally excellent.

Education and awareness.—"Blue Dragon," a joint programme of the National Trust for the Cayman Islands and the Cayman Islands National Gallery, has been active throughout the year. This is an art-based project designed to attract interest from the entire local community. Sixteen giant fiberglass sculptures of the Blue Iguana were commissioned from a studio in the USA, delivered unpainted, and offered to selected local artists as a medium for expressive art. A wide range of interpretations is appearing, varying from realism to the abstract. Each iguana, once painted, will be permanently placed in a public area, with a sign providing core facts about the Blue Iguana and information about the artists and their inspiration. The project also involves school

activities and a new “Blue Dragon” poster designed for young teenagers. The sculptures are expected to last at least 10–20 years.

Building on the surge of awareness about the Blue Iguana, a longer-term approach is also underway. An education module for the local National Schools Curriculum, centered on the Blue Iguana, is under development. Local education specialist, Juliet Austin, is under contract to deliver modules through 2003–4.

A short film, designed mainly for school use in association with the curriculum modules, was filmed gratis by Dorothea Schwab (Wild Wings Vision, Cologne, Germany). Postproduction awaits funding for studio rental, professional editing, and sound work.

The programme has remained high profile in local news media, and a quarterly email newsletter “Blue Iguana Tales” has been launched. The project web site (www.BlueIguana.ky) continues to see incremental enhancements, thanks in large part to John and Sandy Binns.

Funding.—The phase 1 expansion of the captive breeding facility was paid for with grants from the Disney Wildlife Conservation Fund, Maples Finance (Cayman), Tulsa Zoo, Woodland Park Zoo, IRCE, and IIS, with assistance from Fort Worth Zoo.

A grant from IIF has been directed to generating sustainable financing, with retail products and a sponsorship program. Sale of mouse pads (designed and produced in collaboration with John and Sandy Binns) has yielded approx. \$5,000 to date, and a “sponsor an iguana” programme was launched in October.

Funds from the Disney Wildlife Conservation Fund are covering the school curriculum work in part. A grant also has been secured from AZA/Conservation Endowment Fund to pay for materials needed in the phase 2 expansion of the captive breeding facility. A small grant from the St. Louis Herpetological Society is paying for creation of nest mounds for the released iguanas in the QEIIBP.

Research.—Work on the taxonomic status of the Blue Iguana has progressed: Fred Burton, assisted by Karen Graham and Trey Harrison, photographed reference specimens at the University of Kansas Natural History Museum for scale analysis, and additional images were provided by the San Diego Zoo. Fred has since submitted a paper, “Taxonomic status of the Grand Cayman Blue Iguana,” to the Caribbean Journal of Science, which is now accepted subject to final revisions. The paper elevates the Blue Iguana to full species status, as *Cyclura lewisi*.

Rachel Goodman, University of Tennessee, is currently writing the results of her fieldwork on Grand Cayman, and will be publishing a series of papers on the released *C. lewisi* population in the QEIIBP. An additional paper (Burton, Goodman, & Gould), covering the diet of wild *C. lewisi* in various environments, is in preparation.

Institutional.—The National Trust for the Cayman Islands and the Durrell Wildlife Conservation Trust recently signed a memorandum of understanding that formally involves DWCT in the Blue Iguana Recovery Programme. This is a general framework agreement, with details of joint project activities yet to be determined.

The programme continues to operate under the auspices of the National Trust for the Cayman Islands, with a wide range of local and international partners.

Frederic J. Burton, Director

Blue Iguana Recovery Programme, Grand Cayman

Jamaican Iguana Field Research and Recovery Project: 2003 Summary

Forest Use.—Charcoal burning along the trail used by the iguana field team has greatly diminished. However, burners are encroaching deep into the forest along other trails. Also, harvesting of sticks in coastal areas remains a problem and has created a security risk for conservation activities in the south.

Nesting Season.—A total of 12 females showing indications of nesting were observed at the known nesting sites. Excavation and closing of the nest was confirmed in seven females. Nesting activities lasted from 1–20 June, and peaked 8–11 June. Eight of the 12 females could be individually identified by PIT tags and/or beads. Two of these females were repatriated headstarters, including one that was observed nesting for the first time. From 2000–2003, a total of 15 tagged females nested at the known sites; six of these females were repatriated headstarters. Blood of five animals (four nesting females and a male) was collected during the nesting season for analysis.

Hatching.—Hatchlings emerged from 25 August to 14 September and were intercepted by fences around the nesting sites. Nine batches of hatchlings could be distinguished, probably representing different clutches. Overall, 71 hatchlings were recorded, of which 68 (sex ratio 31:37) were equipped with PIT tags; 24 hatchlings were taken to the Hope Zoo.

Repatriations.—Nine headstarted animals were repatriated on 28 September, increasing the total number of repatriations to 57. An additional 8–9 iguanas will be released later in the year. Maximum confirmed period of survival in the field after repatriation was extended by 1–2 years for four previously released iguanas.

Predator Control.—The system of 40 live traps continued to operate and produced similar results as in previous years, capturing mongooses, cats, and rats. Experiments using “artificial nests” (chicken eggs) to assess the effectiveness of the predator control measures were expanded.

Pitfall trap survey.—The annual pitfall trap survey was conducted from 23 January to 22 April. It monitors possible positive population responses of rare species, particularly among the ground-dwelling herpetofauna, to the reduced density of mongooses.

Portland Bight Protected Area (PBPA).—Jamaica’s conservation authority (NEPA) has assigned major management responsibilities to an environmental NGO (CCAM) for parts of the PBPA — but excluding the Hellshire Hills and Goat Islands. Although CCAM has some non-management functions for



Jamaican Iguana (*Cyclura collei*). Photograph by John Binns.

these latter areas as well, actual management will be up to the landowner, the Urban Development Company (UDC). It remains to be seen how UDC and CCAM will split responsibilities for the areas that are most important to the iguanas. Cooperation between the two organizations has failed so far. Work on the establishment of a satellite population of iguanas on Great Goat Island will have to await the clarification of these management issues.

Peter Vogel

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Territorial and Reproductive Behavior of the Mona Rock Iguana, *Cyclura cornuta stejnegeri*

In March 2003, the University of Puerto Rico (UPR), in collaboration with the Department of Natural and Environmental Resources (DNER), initiated a three-year project on the Mona Island Iguana, *Cyclura cornuta stejnegeri*. Our final goal is to gather information about the biology of the Mona Island Iguana to create a model establishing the actual status of the population, and to provide the conceptual framework for conservation efforts of this species. Specifically we want: (1) to understand the pattern of habitat use and territoriality, (2) to determine the mating system and variance in reproductive success, and (3) to quantify the survival and recruitment of young iguanas into the adult breeding population.

We are using radio telemetry of males, females, and immature individuals, mark-recapture, geographical information systems, and paternity analysis. To date, we have captured 40 animals of all sizes that were measured, photographed, and marked (i.e., pit-tags, colored beads, dorsal scale removal). Tissue samples also were taken from each iguana.

Five marked animals were headstarted iguanas that were released into the wild more than a year ago. In addition, fourteen of the captured iguanas have been radio-marked, producing information about home range and habitat use before, during, and after the nesting season.

During the hatching season, we collected and processed the offspring of ten radio-marked females for paternity analyses. Some of these hatchlings are kept in captivity in the headstarting facilities and others were released into the wild.



Mona Island Iguana (*Cyclura cornuta stejnegeri*). Photograph by Robert Powell.

For the next year, we plan to include two new areas for documenting habitat use and territoriality of radio-marked iguanas in different environmental conditions (e.g., vegetation structure, availability of crevices) through seasons. In addition, we plan to start radio-marking mid-sized iguanas and conduct extensive capture-recapture sessions in the selected areas.

Nestor Pérez and Owen McMillan

University of Puerto Rico, Río Piedras

Alberto O. Alvarez and Miguel A. Garcia

Puerto Rico Department of Natural and Environmental Resources, San Juan

2003 Research Update for Exuma (*Cyclura cyclchlura figginsi*) and Andros (*C. c. cyclchlura*) Islands, Bahamas

Research in the Exuma Islands, Bahamas focused primarily on surveying the translocated iguana (*Cyclura cyclchlura figginsi*) population on Pasture Cay in the Exuma Cays Land and Sea Park and the natural populations on Bitter Guana and Gaulin Cays.

In February 1992, 16 Exuma Island iguanas were translocated from Leaf Cay (NW of Lee Stocking Island) to Pasture Cay, Exuma Cays Land and Sea Park. During the 2003 field season, our primary objective was to initiate a live-trap rat study, check the status of the translocated iguanas, and search for evidence of first year iguana recruitment.

A total of 137 trap nights was recorded on 26–27 May. Eleven rats (including one recapture) were registered, marked by toe clipping, and released. Thirteen iguanas were captured, including one first-year hatchling. The recaptured adult iguanas all appeared healthy. Finding a healthy first-year hatchling was encouraging, and supports my supposition that rats do not pose a significant threat to iguana populations. More data obviously are needed to substantiate this hypothesis and the study will be expanded in future years.

Unfortunately, two large male iguanas died after translocation. On 24 December 2003, iguana #11 was discovered washed up on a Compass Cay beach. The carcass was recovered by volunteers from the Exuma Cays Land and Sea Park and turned over to me. The other iguana (#12) was last seen by Park volunteers in March 2003 and discovered dead on 25 April 2003. The carcass was left on the main southwest beach, but was not recovered by my team.

Objectives for the 2003 Andros field season included: (1) estimating population density, (2) determining home range and habitat preferences for adults, (3) investigating reproductive ecology, (4) determining dispersal distances, habitat preference, and survival of hatchlings, (5) performing ethnographic interviews with local Bahamians concerning historic and contemporary iguana exploitation, and (6) distributing tourist surveys relating to perceptions of iguanas and willingness to pay national park entrance fees. Lack of space precludes covering all objectives here so the focus of this report will be reproductive ecology and hatchling survival.



Exuma Islands Iguana (*Cyclura cyclura figginsi*). Photograph by John Binns.



Anegada Iguana (*Cyclura pinguis*). Photograph by John Binns.

The reproductive ecology portion of the research was extremely successful. The Andros Iguana is the only iguana documented to nest in termite mounds, but I had only mild success finding nests in 2001 (N = 1) and 2002 (N = 3). However, 18 nests were discovered in 2003. Clutch size ranged from 3–19 eggs and SVL of ovipositing females ranged from 34.0–44.6 cm. A number of termite mound parameters (height and circumference, % vegetation cover, distance to < 50% canopy coverage, and average skirt depth) were recorded for used and unused mounds. Significant differences were evident only in mound height and average skirt depth. Temperature data loggers also were placed in and above five used mounds to record internal nest and surrounding ambient temperatures. Temperatures inside mounds were significantly higher and more constant than in the ambient environment.

Radio transmitters were attached to 41 hatchlings from seven nests in five locations and they were subsequently tracked for up to eight weeks. Hatchlings remained alive for an average of eight days, and only two hatchlings remained alive at the end of the study. One hatchling was presumed taken by a bird, another by a fish, and the remainder by snakes. We will return in 2004 to track additional hatchlings, but these results suggest that snake predation is significant on Andros and possibly throughout the West Indies.

Charles Knapp

*Conservation Department, John G. Shedd Aquarium, Chicago, Illinois and
Department of Wildlife Ecology and Conservation, University of Florida, Gainesville*

Anegada Iguana, *Cyclura pinguis* 2003 Update on Field Research and Release Project

In July 2003, the remaining wild population of *C. pinguis* was surveyed by an eight-member team of volunteers. Due to time constraints, the survey was confined to the western half of the island, which is believed to support the majority of the existing population. Over 50 km of line transects were walked, during which all sightings of animals, retreats, tracks, and feces were recorded. Nearly all of the sightings were confined to the known core iguana area on the northwestern coast of the island, and the

boundaries of this area were more precisely delineated than ever before. All iguana sightings were of adult animals, indicating that the population's age structure is still heavily skewed. Iguana sightings were very few, making reliable estimates of population density or size difficult (but in progress). Nevertheless, based on previous fieldwork, the population apparently has declined further in recent years.

In an effort to offset this decline, 24 headstarted iguanas, believed to be large enough to survive in the wild with cats, were released in early October. This event was the first release to take place since the headstart project began in 1997. In April 2003, veterinary staff from the Fort Worth Zoo conducted a thorough health screening of all the potential candidates for release. The veterinary staff returned to surgically implant temperature-sensitive radio transmitters in the animals selected for release during the last week of September. 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).

Twelve of the animals (six from each size class and sex) were released in the sandy scrub of eastern Bones Bight, whereas the other twelve were released in the interior rocky woodland of Middle Cay. Both release sites are within the core area and contain some of the best habitat remaining on Anegada. Animal locations were recorded daily by direct observation for the first 24 days after the initial release.

During this period, focal-animal observations on several individuals each day examined the behavior of the iguanas, with particular attention to foraging and intraspecific interactions. In addition, a remote data-logging telemetry station was used to continuously record body temperatures of the released animals to determine thermoregulatory patterns. To date, one loss has been experienced. The animal was found dead shortly after release; its surgical incision had reopened. All other animals are doing well. Additional monitoring of the released animals will take place during fieldtrips in November/December, January, March, May, and July. The released animals will be captured periodically to assess growth and general health.

Glenn Gerber

Zoological Society of San Diego CRES, San Diego, California

Kelly Bradley

Department of Herpetology, Dallas Zoo, Dallas, Texas

Public attitudes and perceptions regarding conservation of the Anegada Iguana, *Cyclura pinguis*: The use and role of social surveys in conservation

The public can have a major influence on the success of conservation programs, therefore, understanding and adequately addressing any concerns they might have is important. Understanding public attitudes and perceptions about conservation strategies is an important first step toward this end.

In an effort to develop educational programs that will increase public support for strategies to conserve the Anegada Iguana (*Cyclura pinguis*), I carried out a survey of local attitudes and perceptions in July 2003. I interviewed 36 residents of Anegada, British Virgin Islands (representing approximately 30% of the population) using a semi-structured format. Respondents were asked whether they supported or did not support four different conservation strategies: headstarting, cat eradication, national park implementation, and translocation. Respondents also were asked questions to assess their awareness regarding threats to and conservation strategies for the iguanas.



Lee Pagni interviews an Anegadian about attitudes regarding iguana conservation. Photograph by Clinton "Lee" Vanterpool.

The respondents highly supported three conservation measures: headstarting, cat eradication, and national park implementation. They were less supportive of translocation. In terms of awareness, respondents were generally aware of the threat that cats pose to the iguanas and the role that the headstart facility plays in counteracting this threat.

This information is extremely useful for the implementation of conservation strategies. The non-structured interview format was essential for obtaining other information about the community: perceptions, questions, and concerns that are additionally important. Collecting information on public attitudes raises the question of when and how public input should be used to guide management decisions.

Lee E. Pagni

Conservation Education Consultant for the Zoological Society of San Diego

Ricord's Iguana, *Cyclura ricordii*: Isla Cabritos Population Census 2003

In 2003, three teams of people from the Indianapolis Zoo, ZooDom, and the Fort Worth Zoo conducted iguana population surveys on Isla Cabritos, Dominican Republic. The work was funded primarily by the Indianapolis Zoo, with support from ZooDom, the Miami Metro Zoo, and the Cleveland Metroparks Zoo. On the first trip in April (which corresponded loosely with the breeding season), we used GPS units to set 20 transects that ran the width of the island every 500 m to the east of the main trail. We also collected our first set of data, recording all iguana sightings (Ricord's and *Cyclura cornuta*), as well as iguana sign such as dens, scat, etc. We also recorded sightings of cats, donkeys, horses, and cows. The island currently is connected to the mainland with a wide land bridge, and hoofed stock is much more numerous, especially on the west end of the island. We were pleased to find Ricord's Iguanas in fairly good numbers at several sites. In fact, they seemed to be more numerous than *C. cornuta* in the center of the island. In June, which we hoped would correspond with the nesting season, another group set four more transects, and walked each of the 24 collecting data. Several nests were marked during this trip, but the rangers believed that the animals had nested early this year due to early rains. In September, the last group walked all of the transects, and observed hatchling Ricord's Iguanas in two areas. The data are in the process of being formally analyzed and a more detailed report will follow. Many thanks to all the teams who suffered heat exhaustion, dehydration, scorpions in tents, geckos in the outhouse, and pony stampedes at night to collect these data!



Ricord's Iguana (*Cyclura ricordii*). Photograph by Robert Powell.

Other *Cyclura ricordii* news:

- Four hatchlings at ZooDom are doing well. You might remember that seven hatched during the ISG meeting last year; two died right away and one was accidentally crushed in the exhibit. Animal information has been passed to Tandora Grant for the studbook. No eggs were laid this year. 1.3 animals are currently on exhibit.

- Grupo Jaragua and the Indianapolis Zoo submitted a grant proposal to the Pittsburgh Zoo to support a socioeconomic study of why people are hunting iguanas in the Pedernales area. This is based on the preliminary survey work done by Ernst Rupp in this area.
- Indianapolis Zoo, ZooDom, and Grupo Jaragua submitted a major grant proposal to the U.S. Fish & Wildlife Service to support teacher and community education programs in Santo Domingo and towns bordering iguana habitat.
- A meeting date in 2004 needs to be set to discuss survey findings and determine next steps for a recovery plan based on these data.

Jan Ramer, DVM

Indianapolis Zoo, Indianapolis, Indiana

The Technical Consulting Subcommittee for the Conservation, Management, and Sustained Exploitation of Iguanas in México

The Technical Consulting Subcommittee for the Conservation, Management, and Sustained Exploitation of Iguanas in México (STC-Iguanas) is part of the National Program for the Recovery of Priority Species, which was created to promote working groups to develop conservation programs for selected species in México. So far, it joins 23 subcommittees, among which the marine turtle and crocodile working groups have been active for a long time. STC-Iguanas was constituted on 16 May 2002 in Villahermosa, Tabasco, as the result of five National Workshops on Captive Management of Iguanas.

The Subcommittee now has 46 active members, including researchers in biology, ecology, veterinary medicine, and electronics, as well as private and communal producers of meat and pets, and a governmental counterpart. It is divided into six regional working groups (North Pacific, West, South Pacific, Center, Gulf, and Yucatan Peninsula) and four by specialty (research, education, diffusion, and training; exploitation, inspection, survey, and legislation; and finance).



San Pedro Nolasco Spiny-tailed Iguana (*Ctenosaura nolasicensis*).
Photograph by John Binns.

Our main objective is to function as consultants for any activity related to the conservation and production of iguanas, to produce a document to regulate the protection and use of iguanas within UMAs (Management Units of Wildlife), the unique legal entity that regulates wildlife species for trade. Also, we promote discussion on problematic issues related to the conservation and management of these species among our members and create environmental education programs directed to rural communities associated with conservation and production programs.

Current activities include: (1) the organization of the VI National Workshop on Iguanas, including a full course on captive management; (2) the production of the first draft of the National Program for the Protection, Conservation, Research, and Management of Mexican Iguanas; (3) creation of a web site that will be linked to main pages addressing the conservation of iguanas; (4) creation of a literature data base about Mexican iguanas; and (5) promotion of a handbook for the captive management of iguanas.

The long-term goal of the STC-Iguanas is to generate management and conservation strategies for all species of iguanines. However, at this moment, we are focused primarily on what appear to be the most threatened species: the Green Iguana (*Iguana iguana*), the Black Iguana (*Ctenosaura pectinata*), the Tilcampo (*Ctenosaura acanthura*), and the Banded Iguana (*Ctenosaura similis*). Action has focused on providing alternative exploitation techniques to poor rural communities in Mexico in order to stop the massive hunting of these species, and to diversify iguana usage to increase people's income. Captive management has been considered one of the best options to combine traditional use of the resource with conservation; however, sustained exploitation of wild populations is now being explored.

Víctor Hugo Reynoso

STC-Iguanas, México; Instituto de Biología, UNAM, México, D.F.

The Pacific Banded Iguana: What We Know About Its Conservation Status

Although the Banded Iguana (*Brachylophus fasciatus*) is the more familiar of the two species of *Brachylophus* found in the South Pacific, its status in the wild is virtually unknown. Based on published and verbal distribution records, the species is known to occur on 34 islands in Fiji. In addition, it is found on four islands in Tonga and an introduced population is established on Efate Island in Vanuatu.

Today, Banded Iguanas have been virtually extirpated on the large Fijian islands where mongooses have been introduced, but they still are occasionally encountered on many other islands. Regular reports of Banded Iguana sightings from large and heavily forested islands like Kadavu and Ovalau still occur, as well as from some small, inhabited islands where cats are common and forest remnants are few. A boy with a pet Banded Iguana can be found in many villages, and Fijians still occasionally find them on forest paths, when they are clearing bush for new gardens, or when high in an Ivi or Bau tree picking ripe, edible fruit.



Fijian Banded Iguana (*Brachylophus fasciatus*). Photograph by John Kinkaid.

In September 2002, National Trust Crested Iguana Sanctuary ranger, Pita Biciloa, and I traveled to the large inhabited island of Lakeba, 300 km east of Fiji's capital, Suva. Our aim was to undertake the first systematic survey for Banded Iguanas. We had been told that Banded Iguanas were common on both of the Aiwa islands: Aiwa Levu and Aiwa Lailai. These are small, uninhabited limestone islands (total size: 121 ha), separated by 50 m of deep water, that lie about 12 km southeast of Lakeba. Both Aiwa Islands have been heavily grazed by goats for three or four decades and, although the tall forest appeared mature and diverse, the forest floor was completely open with only an occasional sign of undergrowth or forest regeneration. In three nights on Aiwa Lailai, we counted over 200 Banded Iguanas along our 2 km of transect lines.

Although these lizards are not as abundant as Crested Iguanas are in optimal forest habitat on the Crested Iguana Sanctuary island of Yadua Taba, Aiwa Lailai appears to support a very healthy population of Banded Iguanas. If Aiwa Levu has a similar number of Banded Iguanas per hectare (which seems possible, based on the similarity in vegetation and goat grazing pressure), then these two small islands may have a total population of 6000–8000 iguanas. Small, remote, and virtually inaccessible islands are abundant around Fiji. Their remoteness may be their greatest asset, and hopefully will continue to keep feral animals, invasive plants, and destructive agricultural practices away.

Peter S. Harlow

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The Fijian Crested Iguana: Lost in the South Pacific?

Described in 1981, the Fijian Crested Iguana (*Brachylophus vitiensis*) has been recorded on fewer than ten dry, rain-shadow islands in western Fiji. Using line transect surveys, we estimated the iguana population on the small Crested Iguana Sanctuary island of Yadua Taba (70 ha) at almost 200/ha in beach forest habitat; an average of one iguana per 5 m of transect and an estimated total population for this small islands of more than 6000. Additional surveys of 12 uninhabited and five inhab-

ited islands in the Yasawa and Mamanuca island groups in western Fiji in September 2000 revealed very different results. All of these islands have free-ranging goats and forest fires have occurred repeatedly on most of them over the last few decades. Iguana survey transects were purposely placed through areas within beach forest remnants that had the maximum number and diversity of iguana food tree species. Night searches for sleeping iguanas along a total of 11.2 km of beach forest transects were thus biased towards maximizing our chances of locating this species, and were not designed to estimate average abundance. Groups of 2–5 team members intensively searched the forest along each transect, and collectively searched a total of 44 km over 123 h.

Results suggest that Crested Iguanas are extremely rare or extinct on all of these islands. We found iguanas on only four of 17 islands surveyed: three small, uninhabited islands and a single large inhabited island. A total of six live iguanas were seen on these four islands, plus one dead juvenile iguana was found. It had been killed and partly eaten, presumably by a cat. Feral cats occur on all inhabited islands, were seen on one uninhabited island, and probably exist on most of the other uninhabited islands we surveyed. On all of these islands, Crested Iguana abundance in optimal forest habitat was < 1 iguana per hectare. As Crested Iguanas are not hunted, eaten, or traded, their rarity on all islands except Yadua Taba appears to be due to the combination of habitat loss and degradation due to forest clearing, burning, and intensive goat grazing, and the introduction of invasive plant species and exotic predators such as cats and rodents.

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Fijian Crested Iguana (*Brachylophus vitiensis*). Photograph by Peter Harlow.

Turks and Caicos Iguana, *Cyclura carinata carinata*: 2003 Project Update

In January 2003, we conducted our last planned translocation of iguanas in the Turks and Caicos. Sixty adult iguanas (30 males, 30 females) were moved from Big Ambergris Cay to Six Hills Cay East, a 4-ha island located approximately 10 km north of Big Ambergris. With this move, we have founded a total of four new populations and moved 218 adult animals: 76 from Little Water Cay, threatened by feral cats, to Middle Cay ($n = 18$) and Bay Cay ($n = 58$) in the Five Cays, and 142 from Big Ambergris Cay, threatened by development, to French Cay ($n = 82$) and Six Hills Cay East ($n = 60$).

To assess the success of these new populations, we have been comparing their biology (survival, growth, reproduction, diet, and endocrinology) to that of their respective source populations. With the help of over 20 volunteers, fieldtrips were made to all of the translocated and source populations in January/February, May/June, and August/September 2003.

On each of the translocation cays, we found evidence of nesting in May/June, and captured and marked newly emerged hatchlings in August/September. Although we have found no difference in hatchling size between translocated and source populations, yearlings on the translocation cays are averaging 2–4 times the mass of those on the source cays. Translocated adults also are experiencing increased growth rates relative to adults on the source cays, although the difference is not as great. We attribute increased growth rates on the translocation cays to the relative lack of competition for food and space on these islands, and predict that growth rates will decrease as these populations begin to approach carrying capacity. Survival of the translocated adults and their progeny appears to be very high. To date, only four of 218 iguanas translocated are known to have died, corresponding to a survival rate of 98% among adults.

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Turks and Caicos Iguana (*Cyclura carinata carinata*). Photograph by John Binns.

Lesser Antillean Iguanas, *Iguana delicatissima* and *I. iguana*

A preliminary visit to St. Eustatius in September 2003 suggested that the population there is in much worse condition than anticipated. In light of threats elsewhere, the “threatened” Redlist status may no longer be warranted. Bob Powell will be doing some more extensive work on St. Eustatius in June 2004, trying to establish the extent of the species’ range on the island, estimate current numbers, and initiate a program leading to greater awareness of the iguanas’ plight by St. Eustatians. Michel Breuil and Bob Powell will be revisiting the species’ Redlist status, looking both at the entire species and island-by-island populations.



Lesser Antillean Iguana (*Iguana Delicatissima*). Photograph by Glenn Gerber.

The September issue of IGUANA included a newsbrief on Anguilla, in which Karim Hodge reported discovering evidence that Green Iguanas are breeding in an area near where they arrived a few years ago, but where they weren’t supposed to be anymore. The potential threat to *I. delicatissima* is obvious.

During the summer of 2002 on Grenada, we encountered so few Green Iguanas (*Iguana iguana*) that we were unable to generate any meaningful data. Anecdotal information from residents suggests that the animals are common nowhere and are most likely to be encountered in dry forests near developed areas where no hunting occurs.

Apparently, hunting has considerably reduced populations of these lizards in moist upland forests, although some reasonably healthy populations may still occur in areas that remain very difficult to access. Note that, on Grenada, Green Iguanas are considered game animals and a hunting season exists. This obviously makes it easier for poachers to ply their trade, especially since enforcement of existing regulations is lax to non-existent.

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St. Lucian Iguana Project: 2003 Summary

Activities for the year included eight principal areas: (1) Beach searches: Goals were to collect distributional data across St Lucia using the most efficient search method (nesting signs), prioritize search efforts (sites) for 2004, and identify methodological considerations for assessing habitat suitability. Almost all beaches around St Lucia were searched at least once, although this effort was insufficient, attributable primarily to earlier than anticipated onset of nesting and lack of manpower. (2) Nesting indices: The principal goal was to generate an index or indices of nesting female iguana numbers from counts of nesting signs (to be used for future monitoring). Some data for the main nesting beach will allow a preliminary examination of the feasibility of calibration (see 3, below); data for the only other known nesting area, are insufficient. Data are pending analysis, but are likely to be insufficient to generate a reliable index, attributable primarily, as in 1 above, to earlier than anticipated onset of nesting and lack of manpower. (3) Hatchling counts: The primary goal was to obtain a full count of hatchling numbers (and by extrapolation nesting female numbers), primarily to calibrate the easier-to-collect index of nesting (see 2, above). A reasonably full count was made (the onset of hatching was missed, but we can extrapolate back). Also, data on hatchling sex ratios, emergence times, body condition, and health problems were collected. The onset of hatching was earlier than anticipated (even taking into account the earlier than anticipated onset of nesting). I believe all major nests at the main nesting beach were monitored. We were not able to monitor the other nesting beach. (4) Hatchling predator counts: The principal goals were to quantify predator activity at the place and time of hatchling emergence and to confirm mongoose predation on hatchlings. I believe all the main predators at the nests are identified. Stomach contents confirm predation by mongooses. Cats were identified as a predator in 2003 (but not in 2002). Quantitative data were collected, but not rigorously. Standardized counts will require more manpower if attempted alongside hatchling counts (as in 2003). Greater trapping effort is warranted next year, including areas away from nest sites (5) Radiotracking females: The principal goal was to confirm a nesting migration distance of 2–3 km to the main nesting beach. To date, only one large adult female has been tagged in the zone 2–3 km from the beach, despite two months of effort. The tagged female initially behaved as expected, moving in a small home range, but in December began moving toward the nesting beach. Tracking and searches for more females to tag are continuing, led by the Forestry Department, with GPS location updates by email. (6) Site management (main nesting beach): The primary goal is to utilize an agreement with the landowner



St. Lucian Iguana (*Iguana iguana*). Photograph by Matthew Morton.

to alert local people to, and enforce if necessary, changes in site management at this beach. Four metal signs have been erected to advise locals to keep dogs leashed, road access to the nesting beach is blocked with chain (to hinder sand mining), weekly patrol routes have been mapped, and an agreement has been reached with the Forestry Department on patrols. The Forestry Department will continue to patrol weekly by van, at least through the vulnerable nesting period (roughly January–May). They will seek cooperation from the St. Lucia police for accompaniment by an armed officer to shoot untied dogs. Well-attended community-led beach clean up (post hatching) led to extensive media coverage. This effort was primarily educational in intent (rubbish leads to rats leads to mongooses). (7) Ecotourism initiative: The principal goal was to assess the potential for community-based, small-scale ecotourism within key communities currently using known iguana sites. A feasibility study, covering primarily an assessment of the natural resource base (conducted by the Forestry Department) and a stakeholder analysis (conducted by Heritage Tourism) is in preparation. This is essential for developing a funding proposal. Although Heritage Tourism has yet to conduct their stakeholder analysis workshop, I hope the funding proposal will be developed/submitted to seek funds for the financial year starting April 2004. (8) Education proposal: The principal goal is to develop a community-based program of curricular activities addressing iguana conservation in northeastern St. Lucia. A full proposal, with detailed activities, timeline, and budget, is to be submitted by the Forestry Department as the St. Lucia lead and (tentatively) by K. Graham (Sedgwick Co. Zoo) as the overseas contact.

Matthew Morton

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