

Recent Literature

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ISG Contact Information

Allison Alberts, Co-Chair
Zoological Society of San Diego
Email: aalberts@sandiegozoo.org

Fredric Burton, Deputy Chair
Blue Iguana Recovery Programme
Email: fjburton@blueiguana.ky

Richard Hudson, Co-Chair
Fort Worth Zoo
Email: RHudson@fortworthzoo.org

Miguel Garcia, Deputy Chair
Center for Applied Tropical Ecology
and Conservation, Puerto Rico
Email: miguelag@umich.edu

<http://www.iucn-isg.org>



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Editors:
Tandora Grant
Allison Alberts



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

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Iguana Specialist Group Newsletter

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2008 ISG Annual Meeting

ISG Meeting Minutes
January 3-8, 2008
Utila, Honduras

Despite a tropical storm, 14-foot seas and one of our boats almost capsizing, the 2008 annual Iguana Specialist Group meeting was productive and enjoyable thanks to the organization of Stesha Pasachnik, Jimena Castillo, Monica Perez, Sandy Echternacht, and the hospitality of the IRBS and the Utilian people. Many new local and international faces were in attendance and we were able to come together to create an action plan for *Ctenosaura bakeri* and a list of research objectives for *C. melanosterna* and *C. palearis*. The meeting ended with a field trip to Cayos Cochinos where we were able to observe *Ctenosaura melanosterna* in the wild.



Left to Right. Bottom Row: Chad Montgomery, Joe Burgess, Victor Reynoso, Jimena Castillo, Catherine Stephen, Bonnie Raphael, Stesha Pasachnik, Bruce Weissgold, Monica Perez. Middle Row: Kirsten Hines, Paola Coti, Wendoli Medina, Melissa Dordrecht, Eugenia Zarza, Sofia Nunez, Chuck Knapp, Peter Tolson, Daniel Ariano, Sandy Echternacht, Dennis Baulechner, Corri Thelwall. Back Row: Jennifer Baker, Glenn Gerber, Lucie Brown, John Iverson, Jan Ramer, Edoardo Antunez, Miguel Garcia, Leslie Ruyle, Rene Gaal, Jeff Lemm, Joe Wasilewski, Andy Snider, Evert Henningheim, and Rick Hudson.



General Reports

Phylogenetic Analysis of the Subfamily Iguaninae. Catherine Stephen (Utah Valley State College) and Larry Buckley (Rochester Institute of Technology).

The large-bodied lizards of the subfamily Iguaninae range throughout the western hemisphere and in the Fijian Archipelago. It is a particularly interesting group because of its ancient Cenozoic origin, broad distribution across multiple geographical boundaries, and high degree of regional and island endemism. Prior molecular and morphological studies have relied upon incomplete taxonomic sampling and/or data from a single locus, resulting in unresolved or conflicting nodes within and between genera. Thus, the evolutionary history of the group and taxonomic status of several lineages remain unclear. In order to generate a more robust phylogeny, we have built upon prior studies by comprehensively sampling the subfamily both taxonomically and geographically, as well as through the addition of independent data sets from nuclear loci. Data presented here are the result of sequencing individuals at four loci (two nDNA and two mtDNA). These loci have varying rates of evolution and thus we are able to resolve deep and shallow nodes within the tree. Data from each locus are analyzed separately using maximum likelihood models and together in a Bayesian analysis. Results of phylogenetic analyses will be discussed in terms of geologic history, morphological convergence, taxonomic inconsistencies, and conservation issues.

Update on the Status of the International Iguana Foundation. Rick Hudson (Fort Worth Zoo).

The presentation will review the six year (2001–2007) history of the International Iguana Foundation (IIF), a nonprofit organization registered in the state of Texas. Organized to help finance priority conservation programs of the Iguana Specialist Group (ISG), the IIF has become a driving force of iguana conservation, having raised over a half million in US dollars since forming. Sources of funds include annual board member pledges (all board members are financially vested), grants, and public/private donations. During the past year, funds were utilized to provide core operating support for the Jamaican Iguana Recovery Program, emergency relief for hurricane damage, workshops and training, facility construction, and to run an annual small grants program. Since 2002, this program has provided critical support of \$230,000 in grants to fund iguana conservation and research programs in Jamaica, Anegada, Grand Cayman, Dominican Republic, Bahamas, Fiji, Mona, Honduras, St. Lucia, and the Turks and Caicos. Administrative and office support are provided by the Fort Worth Zoo ensuring that 100% of all funds raised are spent directly on iguana conservation.



Iguana Red List Authority Needed. Rick Hudson (Fort Worth Zoo).

A new Red List Authority (an individual or group) is needed from the members of the Iguana Specialist Group. The role of the Red List Authorities is to ensure that all species within their jurisdiction are correctly assessed against the IUCN Red List Categories at least once every ten years and, if possible, every five years (note, any assessments that are older than ten years are flagged as 'needs updating', as the status and any supporting documentation provided may no longer be correct). The intention is that no new species assessment will be included on the IUCN Red List until it has been evaluated by at least two members of an appointed Red List Authority or by at least two evaluators appointed by IUCN Species Programme staff. This peer review system places greater responsibility on the SSC network and its partners to ensure that what appears on the IUCN Red List is credible and scientifically accurate. This topic will be discussed at our annual meeting in November.

Population Dynamics and Habitat Use of the Tehuantepec Isthmus Black Iguana in Cerro Tortuga, Ixhatán, México, and the Implementation of the First *Ctenosaura* Reserve. E.C. Orozco-Sánchez, M. del Carmen Corona-Varga (Universidad Autónoma de Tlaxcala), R. Antonio Matus-Velásquez, Ma.L. Martínez-Manuel, R. Álvarez-López, (Presidencia Municipal, San Francisco Ixhuatán), and Victor Reynoso (Instituto de Biología, UNAM).

Population dynamics studies were carried out in Cerro Tortuga, San Francisco Ixhuatán, Oaxaca, to evaluate a severely hunted population of black iguanas. We sampled ten days/month during 15 months, using seven 100-meter transects. We recorded 326 iguanas with a maximum weight of 2500 grams (males) and 1500 grams (females). Of all records, 81% were adults, 7% juveniles, and 12% hatchlings, and most of the sightings were females. Mortality increased in March and iguanas were most abundant from November to May. Monthly estimated population densities were alarming, the lowest ranging from 0.19 to 1.3 individuals/km². Behavioral data showed that iguanas prefer basking in cacti (*Pachycereus* spp.) at a height of three meters within a six meter escape distance from their burrow, indicating a small home range. Most activity was registered from noon to 1 pm when temperature ranged between 33–35° Celsius. Preferred food was a plant called “coquito” (*Coiratarrii niciensis*) of which iguanas disperse the seeds. Fieldwork carried out by our lab attracted the attention of local people and inspired the implementation of the first iguana community-municipal reserve in the area, near the village of “El Morro” in San Francisco Ixhuatán, Oaxaca. The reserve, called Uma Cerro Tortuga-Iguanas, was formally established on December 5, 2007. The reserve comprises 1472 hectares and protects: iguanas, anteaters, margay, armadillo, porcupine, jaguarundi, kinkajou, beaded lizards, parrots, and the endemic hare, *Lepus flavigularis*, among others.



Sustainable Harvesting of Black Iguana: Matrix Models. W. Medina-Mantecón, Victor Reynoso (Instituto de Biología, UNAM), and E. Vega-Peña (Instituto Nacional de Ecología).

A demographic analysis on a spiny-tailed iguana population in the Tehuantepec isthmus was done to evaluate its conservation status. Most Mexican iguanas are endemic and listed as Threatened in the Mexican Red List NOM-059-2001. In Oaxaca, iguana hunting occurs mainly during the oviposition period in spring, when pregnant females are an appreciated dish. This practice strongly affects the population, since females with reproductive potential are eliminated, preventing the recruitment of new individuals. To avoid local extinction, we are preparing a sustainable-use management plan based on the patterns of survivorship, growth, and reproduction from a severely hunted population. We estimated the transition probabilities for each life-cycle category and obtained a Lefkovich (1965) matrix to estimate the finite growth rates of the population ($\lambda = 1.1$), generate Sensitivity and Elasticity matrices, and simulate the growth rate of the population within the context of various harvesting regimes. Growth rates are very sensitive to changes in juvenile survival and age at first reproduction. Computer simulations were used to explore possible sustainable harvest regimes varying size classes at which iguanas could be hunted and the years between hunting periods. We found that if size classes between 25–40 cm only are harvested the population increases, and that if iguanas are not harvested every year the population size will substantially increase. Contrary, if individuals of size class 20–25 cm are harvested, and if hunting occurs annually, the population will decrease considerably. Simulations are fundamental to promote wildlife population management strategies.



Natural History of *Ctenosaura melanosterna* in the Cayos Cochinos Archipelago, Honduras.
Chad Montgomery (Truman State University).

Iguanids throughout Central America and the Caribbean are rapidly declining due to anthropogenic factors including habitat destruction and the exploitation of eggs and adults for food. *Ctenosaura melanosterna*, the black-chested spinytail iguana, exemplifies this decline and is vulnerable due to its limited geographic distribution, occurring only in the Rio Aguana Valley and the Cayos Cochinos Archipelago, Honduras. The archipelago consists of two main islands, Cayo Cochino Grande and Cayo Cochino Pequeño. Population sampling was conducted on Cayo Cochino Pequeño on 29 different days and on Cayo Cochino Grande on ten different days between 21-May-07 and 24-August-07. We captured a total of 121 (61M:60F:1Unk) individual *C. melanosterna* during our sampling on Cayo Cochino Pequeño. The sex ratio was not significantly different from 1:1. There was no significant difference in SVL between male (19.63 +/- 7.4 cm) and female (18.29 +/- 5.49 cm) lizards when all capture data were analyzed. We captured only four (3M:1F) *C. melanosterna* on Cayo Cochino Grande, indicating that the population is very low. On Cayo Cochino Pequeño lizards were encountered in areas that are categorized by open canopy and relatively high direct solar radiation. These areas consisted of beach, low lying vegetation, open Tike forest, palm forest edge, and forest edge (such as along trails). Testing of published microsatellite primers for *C. hemilopha* indicated that those primers cannot be used for *C. melanosterna*.



Molecular Analysis of the *Ctenosaura melanosterna* Clade: Insights into Phylogeography, Speciation, and Conservation. Stesha Pasachnik (University of Tennessee).

The genus *Ctenosaura*, overlapping in range with the Mesoamerican hotspot, exemplifies the hotspots reasoning, brought forth by Myers et al. in 2000, in that it is diverse, is threatened with extinction, and lacks sufficient means of protection. Four of the five Critically Endangered species of *Ctenosaura* make up the *C. melanosterna* clade, occurring within Honduras and Guatemala. Due to the current situation of these species, it is imperative that immediate evaluation of this

clade be performed in order to facilitate critical management decision making and direct future research. Molecular phylogenetic analysis has been performed on the *C. melanosterna* clade. The results from both mitochondrial and nuclear markers suggest that this clade has gone through rapid speciation resulting in four closely related narrow-range endemics that occur in both insular and continental habitats. In addition, AMOVA and Φ_{st} data show support for the species groups previously defined. The potential for hybridization between the island endemic *C. bakeri* and *C. similis* on Utila was also evaluated. For this, we find that though hybridization is possible, the occurrence is far too low to be considered a threat to *C. bakeri* at this time. Additional molecular analysis is needed to further elucidate the phylogenetic relationship between the members of the *C. melanosterna* clade and to better understand the colonization rates and patterns of these species and their congener *C. similis*.



Mitochondrial and Nuclear DNA Phylogeography of the Spiny-tailed Iguana (*Ctenosaura pectinata*) and Related Species. Eugenia Zarza, B.C. Emerson (University of East Anglia, UK), and Victor Reynoso (Instituto de Biología, UNAM).

Regarding the origin and evolution of Neotropical organisms, it has been considered that Quaternary climatic changes were a major factor leading to speciation. However, other views suggest that species originated before the Pleistocene. We used mitochondrial and nuclear sequence data for a detailed phylogeographic study of the Mexican iguana *Ctenosaura pectinata*, and related species, to discern whether Pleistocene climatic changes affected and structured the populations of this lowland-distributed taxon. Both datasets support the existence of cryptic lineages. Some of them form zones of secondary contact. Evolutionary network analyses reveal a dynamic demographic history of fragmentation, expansion, extinction, and recolonization. Estimated divergence times suggest that *C. pectinata* originated during the Pliocene, whereas within-species matrines started to differentiate during the Plio-Pleistocene and Pleistocene. Our results highlight the influence of Pleistocene events in shaping the distribution of genetic variation in Neotropical lowland organisms and as potential drivers to speciation in the region.

Update on the International Reptile Conservation Foundation. John Binns (IRCF).

The principal aim of the International Reptile Conservation Foundation (IRCF), a not-for-profit organization registered in the state of California, is to facilitate conservation programs that contribute to the survival of threatened and endangered reptiles throughout the world. Providing targeted multi-level support, including but not limited to funding, fund-raising, volunteer coordination, publication, communications, logistical support, web development, promotion of species awareness, and acting as a fund portal for existing conservation programs, the IRCF is part of the total conservation solution. Since its inception, the IRCF has raised \$434,568 for conservation. Funds have been raised from a variety of sources, including public and private donations, grants, web-based marketing, and membership dues, which provide members with a subscription to the Foundation's journal, Iguana. Focused on the conservation and natural history of reptiles, Iguana seeks to inform, entertain, and educate its readers. Journal subscribers and contributors include academics, zoo professionals, and committed hobbyists, all of whom share a common interest in conserving reptiles and their habitats. The IRCF has provided support for conservation programs in Grand Cayman, Little Cayman, Guatemala, Argentina, India, Dominican Republic, Anegada, Jamaica, Honduras, Fiji, and The Bahamas. The IRCF, in partnership with Zoo Atlanta and Zootropic, has recently purchased land in Guatemala for a wildlife sanctuary to preserve crucial habitat for critically endangered reptiles.



Iguana Research and Breeding Station, Utila.
Photos by Jeff Lemm.



Joint ISG and IIF Meeting 2008

The ISG and IIF will hold their meetings back to back at the White Oak Conservation Center in Yulee Florida, just north of Jacksonville on the Georgia border. The dates are 10-14 November and the order of the meetings has not yet been determined. White Oak is potentially interested in establishing a *Cyclura* program and would like our advice on husbandry, housing, and the potential for involvement in field conservation efforts. A nominal fee will be charged for accommodation, three meals per day, and meeting space - approximately \$100 per day per person. The ISG met last at White Oak in 1998 and the facilities were very conducive to *working* meetings, with few distractions. Since we will not have a coincident Recovery Plan workshop to conduct, we will spend time catching up on the backlog of projects I feel has fallen by the wayside. For example, the IUCN Red Listing assessments for *Cyclura* are outdated and need revision, and we need a new Red List Authority. The standardized field techniques manual that we keep discussing should be completed in this workshop. It may also be time for a re-prioritization of iguana species and projects.

Thanks and hope to see you in Florida,
November 2008!!
RHudson@fortworthzoo.org

Caribbean Iguana Session

DOMINICAN REPUBLIC - Ramer

Update on *Cyclura* Conservation in the Dominican Republic. Jan Ramer (Indianapolis Zoo).

In January 2007 three capacity-building workshops were held in Dominican Republic funded by a grant from the USFW. Partners in the project included Grupo Jaragua, ZooDom, the Dominican Ministry of Wildlife and Biodiversity, Durrell Wildlife Conservation Trust and Indianapolis Zoo. The first workshop was held in Santo Domingo at ZooDom, and was presented to government scientists and technicians and NGO scientists and students. It was well received and promoted, stimulating discussions about scientific applications and conservation. The second was held in La Descubierta for the rangers that work on Cabritos, but was also attended by government officials, and was also well received. At this meeting we strove to facilitate ranger participation in generating conservation ideas for the areas and species they protect. The third was held in Pedernales, and was attended by college students, high school students, and NGO scientists including a group from Haiti. This workshop included a trip to the study site so that participants could get a feel for field conditions. There were several students who seemed particularly stimulated, and our hope is that they will continue with their interest in school, perhaps making a career of conservation, science, or both.

Grupo Jaragua has been very busy surveying nesting activities of *C. ricordi* in the area as part of their larger program to conserve biodiversity in the biosphere reserve in the southwestern part of the Dominican Republic. They are also conducting a land tenure study in Ricord's iguana habitat in Pedernales region and are working hard to pinpoint critical areas where clashes between agricultural use and conservation are brewing. They are considering possibilities like purchasing a buffer zone around nesting areas, promotion of land use that will be minimally detrimental to iguanas, and coordinating

with local governmental agencies to prevent further habitat destruction. This work was done with funding from the IIF and MacArthur Foundation.

Grupo Jaragua also just received funding from the IIF to continue work in Haiti where a small population of Ricord's iguanas has been located. They are working with a Haitian NGO and are translating the curriculum developed in 2006 for Dominican 3rd graders into French and Creole for use in schools in the area (funded by USFW and AZA-CEF; partners were Indianapolis Zoo, Grupo Jaragua, and ZooDom).

ZooDom has been busy breeding Ricord's iguanas. They've had three clutches hatch since 2002, and the 3.1 individuals from 2002 are quite large and need placement. The ten hatchlings from 2004 are growing quickly and needing placement, and there were 15 hatchlings last fall! The curator asks that the ISG try to make some recommendations, as breeding was part of the SRP, but placement of hatchlings has not been addressed.

Indianapolis Zoo received a grant from a board member to continue the survey work on Cabritos. Transect methodology set in 2003 was discussed with Richard Young of DWCT, and slight adjustments will be implemented when the team returns in April of this year. The Indy group will be accompanied by folks from Toledo Zoo, Grupo Jaragua, ZooDom, and the Ministry of Wildlife and Biodiversity. The Indy team will return annually, and hope to recruit a Dominican scientist to continue survey work throughout the year. Through a grant from Mazuri, health assessments of free-ranging *ricordi* and *cornuta* will be continued as well on the April field trip.

Dr. Roberto Maria had his paper published this year; the pdf is available by contacting Jan Ramer. Maria, R., J. Ramer, T. Reichard, P. Tolson, M. Christopher. 2007. Health assessment of free-ranging Ricord's iguanas (*Cyclura ricordi*) in the Dominican Republic. *Journal of Zoo and Wildlife Medicine* 38(3): 414-419.



Ctenosaura Session

The *Ctenosaura* - *Heloderma* Project: A Novel and Successful Approach to Conservation of Endangered Reptiles in Northeastern Guatemala. Daniel Ariano-Sanchez (Zootropic, Guatemala).

The *Heloderma* project began in early 2002 as a way of generating scientific knowledge and developing conservation strategies for the endangered Guatemalan beaded lizard (*Heloderma horridum charlesbogerti*) and its habitat in the semiarid region of the Motagua Valley in northeastern Guatemala. In early 2007, the critically endangered spiny tailed iguana *Ctenosaura palearis* was included within the scope of this project. The project has been carried out by the Guatemalan NGO Zootropic and since its beginning has had many partners and sponsors to achieve the main goals of conservation. Among these partners the most important are the International Reptile Conservation Foundation, Zoo Atlanta, The Nature Conservancy, the National Fund for Nature Conservation, and some private companies. The project consists of four main fields of action: applied scientific research, education programs for local villagers, land conservation projects, and development of conservation policies to be adopted by governmental institutions in charge of biodiversity conservation. Some of the most important results of the project since its beginning are 1) the transfer of *H.h. charlesbogerti* from Appendix II to Appendix I of CITES protection, 2) the development of a National Strategy for the conservation of the Guatemalan beaded lizard and its habitat, 3) development and implementation of an education program focused on the villagers that interact directly with *H.h. charlesbogerti* and *C. palearis*, and 4) the establishment of the first private protected area for conservation of *H.h. charlesbogerti* and *C. palearis* habitat with an extension of 138 acres.



Ecology and Use of the Guatemalan Black Iguana *Ctenosaura palearis* (Squamata: Iguanidae) in the Dry Forest of the Motagua Valley. Paola N. Coti (Universidad del Valle de Guatemala) and B. Salazar (Zootropic).

Ctenosaura palearis is an endemic iguana from the region of the Motagua Valley. The ecology has been little studied, thereby stopping actions that would allow conservation for this species which is threatened by habitat loss and illegal trade. The main objective of this research is to determine ecological aspects and use of the iguana in the dry forest of Motagua Valley. We conducted surveys of the residents of the region. In El Arenal, Cabañas, and Zacapa, we are estimating the abundance of iguanas, feeding habits assessed by fecal analysis, and habitat characterization using the quadrant point method. The iguanas are used as a source of food for human residents, but also are considered to have medicinal effects. We marked 36 iguanas (18 female, 17 male) which were mainly found in the cactus *Stenocereus pruinosus*. We obtained nine fecal samples which indicated that iguanas are feeding on leaves, fruits, and insects (crickets, beetles, ants, wasps). The habitat of *C. palearis* is characterized by greater frequency of *S. pruinosus*, *Licania hypoleuca*, *Ximena americana*, and *Acacia deamii*. The Guatemalan black iguana can be regarded as a keystone species because they play an important role in seed dispersal, like the *S. pruinosus* seeds, and its trophic position since it is one of the main prey species for the Guatemalan beaded lizard, *Heloderma horridum charlesbogerti*.



Breeding Project and Scientific Work of the Iguana Research and Breeding Station, Utila, Honduras for the Year 2007. Monica Pérez (Iguana Research and Breeding Station, Utila).

One of the main objectives of the Iguana Research and Breeding Station since its foundation in 1997 has been the ex-situ breeding of *Ctenosaura bakeri*. I will describe the procedures followed by the IRBS and results for this year. The IRBS also monitors *C. bakeri* in nature and I will report the results for this year. Finally, I will present a brief description of the scientific research supported by the IRBS.

Ecology and Conservation of the Lesser Antillean Iguana (*Iguana delicatissima*) on Dominica, West Indies. Charles Knapp (Zoological Society of San Diego).

Two exploratory trips were taken to Dominica in 2007 to gauge the research and outreach needs of the Lesser Antillean iguana (*Iguana delicatissima*) inhabiting the island. Iguana surveys were concentrated along the west coast and two primary study locations were identified at Batali Beach and Champagne Bay. A total of 131 iguanas were captured primarily from these locations in order to initiate a multi-year mark/recapture study to estimate population density, survivorship, and growth rates. Blood samples were also taken for future gene flow analyses. Two communal nesting sites were documented and activity recorded to help prepare for the 2008 season. Nine road-killed iguanas were documented over a three-week span during the breeding season. Five of the killed iguanas were confirmed gravid females that were hit while migrating to coastal nesting sites. The carcasses were discovered within a four kilometer stretch of road above Batali Beach. Mortality of eggs, hatchlings, and adult iguanas caused by the August 17 passing of Hurricane Dean was confirmed. The Abòlò (*Ameiva fuscata*) was confirmed consuming iguana eggs as well as Hawksbill sea turtle hatchlings while *Boa constrictor* was confirmed consuming adult iguanas. In general, the iguana population on Dominica appears relatively healthy compared to other islands in the region yet factors are present and emerging that must be mitigated to ensure the long-term survival of the species on Dominica.



Male *Ctenosaura bakeri*. Photo by Jeff Lemm.

Progress in Restoration of a Wild Population of *Cyclura lewisi* to the Salina Reserve, Grand Cayman. Fred Burton (Blue Iguana Recovery Programme).

December 2006 saw the third and largest release of Grand Cayman blue iguanas into the Salina Reserve. A total of 116 blue iguanas aged one and two years old were set free. A release retreat was manufactured, carried into the Reserve, placed, and mapped for each iguana by a team of international volunteers and professional participants coordinated by the IRCF and with active participation from the local community. A year later the fourth release comprised 34 additional captive-bred iguanas, increasing the genetic diversity of the population. Two hundred and forty iguanas have been released into the Salina Reserve, now representing 17 founders. WCS veterinarians joined the team ahead of both releases to health-screen the iguanas: no health issues arose to affect the releases. Monitoring of the released iguanas continued in 2007 and the combined results of fieldwork 2005-07 are currently under analysis to assess the status and future of the population restoration effort. Successful captive breeding continues to generate genetically diverse hatchlings for future release. The majority of the funding for the 2006-07 releases came from donors through the Durrell Wildlife Conservation Trust and the IRCF. Locally, corporate grants continued to support the Programme's work, notably from Walkers, Schroeders, Cobalt Coast, and GreenLight Re. The program received international media exposure during 2007, being featured in the BBC Wildlife magazine, on BBC News, and on the Travel Channel. Local and international volunteerism continues to be vital to the program, which operates with only two paid staff.



Recovery Initiatives for the Mona Island Iguana - the 8th Season. Miguel Garcia, Nestor Pérez-Buitrago (Center for Applied Tropical Ecology and Conservation and University of Puerto Rico), Alberto Álvarez (Department of Natural and Environmental Resources), and Peter Tolson (Toledo Zoo).

Since November 1999, endangered Mona Island iguanas (*Cyclura cornuta stejnegeri*) have been raised as part of a headstart program, a recovery effort aimed to increase the number of young individuals in this population. The first group of iguanas was released in 2002 and a total of 135 iguanas have been moved to the wild as of June 2007. Of these, at least three females have nested successfully. In a parallel study, high male-male territoriality has been documented while male-female territories show great overlap during the non-breeding season. This finding may suggest that the unusual low densities observed in the Mona Island iguana population cannot be explained solely by exotic mammal predation and habitat alteration.



JAMAICA - Hudson for Wilson

Update: Jamaican Iguana Recovery Project. Byron Wilson and Rick Van Veen (University of the West Indies).

Between November 2006 and October 2007, the Jamaican Iguana Recovery Group continued work toward the goal of securing a viable *Cyclura collei* population in the Hellshire Hills and on the Goat Islands. Invasive predator control was conducted throughout the period, with over a hundred individual predators removed. In addition, the NGO Island Conservation made a site visit, demonstrated the use of leg-hold traps for cats, and conducted a logistics planning assessment related to the eradication of invasives on the Goat Islands.

Sixteen iguana nests were deposited at the "Upper" and "Lower" communal nesting sites (combined), suggesting that the number of females nesting in these areas has doubled since initial monitoring efforts in the early 1990's. Total nests in the core area likely exceeded 25,

and over 200 hatchlings may have successfully emerged. Unfortunately, Category 4 Hurricane Dean severely compromised nest site monitoring, and resulted in only 54 hatchlings being measured and PIT-tagged. However, 40 of these were taken to the Hope Zoo for headstarting – double the usual number. Rick van Veen continued radio tracking free-ranging animals and oversaw the field station repairs necessitated by Hurricane Dean. An MOU was signed between UWI and the Urban Development Corporation, which should enhance the potential for cooperative conservation efforts in Hellshire/Goat Islands. Major new initiatives are planned for 2008, including the deployment of "Judas iguanas" to facilitate the identification of other iguana concentrations in the Hellshire Hills. Other focal projects will include a "mega-release" of headstarters and the initiation of biological surveys on the Goat Islands.



TURKS AND CAICOS ISLANDS - Gerber

Conservation Program Update for the Turks and Caicos Iguana, *Cyclura carinata*. Glenn Gerber (Zoological Society of San Diego).

As one of the smallest of rock iguana species, the Turks and Caicos iguana is among the most vulnerable to invasive predators. Once ubiquitous throughout the Turks and Caicos Islands (TCI), the species now occupies less than 5% of its historic range and at least 15 island populations have been extirpated in the past 30 years due to the spread of introduced mammalian predators. Because of this, the Turks and Caicos iguana is listed as Critically Endangered on the IUCN Red List and has been the focus of an active conservation program since 2000. Conservation efforts have centered on establishing additional iguana populations via translocation. Using adult iguanas from large islands under threat from development or invasive mammals, additional breeding populations have now been established on four small protected islands. This program has been very successful and results of recent monitoring of translocated populations will be presented along with plans for another translocation in 2008 and an update on efforts to establish a feral mammal removal program for the TCI.

Conservation Program Update for the Anegada Iguana, *Cyclura pinguis*. Glenn Gerber (Zoological Society of San Diego) and Kelly Bradley (Dallas Zoo).

Once widespread on the Puerto Rican Bank, *Cyclura pinguis* became restricted to Anegada Island after the last interglacial sea level rise. Since European colonization, the species has undergone further population reductions due to habitat degradation and loss, caused by humans and introduced livestock, and predation from introduced mammalian carnivores. As a result, the Anegada iguana is listed as Critically Endangered on the IUCN Red List and has been the focus of an active conservation program since 1997. The iguana population on Anegada is now concentrated in a small portion of the island and composed almost entirely of aging adults, due to heavy predation of juveniles by feral cats that have effectively eliminated recruitment. To increase recruitment, a headstarting program has been established whereby juveniles are collected annually from nest sites immediately after emergence and transferred to a captive facility on island, where they are raised until large enough to survive in the wild with cats. To date, over 100 headstarted animals have been returned to the wild with an average survival rate of 85%. In addition to continuing the headstart program, current efforts are focussed on establishing better estimates of population size and distribution using mark-recapture methods and by mapping and monitoring iguana retreats. Updates will be given for these activities and for recent analyses of genetic diversity for introduced satellite populations on Guana and Necker Islands.



BOOBY CAY, BAHAMAS - Wasilewski

Threats Developing to the Rock Iguana, *Cyclura carinata* on Booby Cay, Mayaguana. Joe Wasilewski (Natural Selections) and Steve Conners (Miami Metrozoo).

Mayaguana, is the easternmost Bahamian island. Presently three settlements occur on this 40x7 km² island and total 300-400 people. Tourism consists of infrequent visits by sportfishermen. Booby Cay, an uninhabited 2.5 km² island, is physically separated

Ctenosaura bakeri on *Utila*. Photo by Jeff Lemm.



from Mayaguana by a shallow 200 meter channel and is approximately 32 kilometers east of the settlements. The only population of the rock iguana, *Cyclura carinata*, outside the Turks and Caicos is found on this cay. These iguanas have been studied since 1998 and the latest population estimate is 500. In spite of its proximity, iguanas do not exist on Mayaguana due to the high number of feral cats and dogs present. Currently there are introduced goats (*Capra hircus*) competing with the iguanas for food and rats are present (*Rattus rattus*). A U.S. development firm is investing \$6 billion in developing Mayaguana. The master building plan includes golf courses, 3000 houses, resorts, marinas, industrial areas, and a new airport terminal. Construction has been ongoing for over a year on this massive project. The plan has several areas designated as wetlands, "natural", and "conservation", but an overall environmental plan is lacking. Clearly the large-scale development underway presents a threat to the environment of the area and especially Booby Cay through increased visitation and potential non-native species introductions. Parameters must be set in place for an environmental plan and guarantee of protected areas. Booby Cay has been proposed for inclusion in the Bahamas National Park system as far back as 1982, and revisiting this issue is critical now.



Fieldwork in the Exuma Islands in 2007 with *Cyclura cychlura inornata* and *Cyclura rileyi*. John Iverson (Earlham College).

Field work in 2007 focussed on population surveys of *Cyclura cychlura inornata* on Alligator Cay in the Exuma Cays Land and Sea Park (introduced in 1988 and 1990), on Allen Cay, other small nearby cays, and Flat Rock Reef Cay just north of the Allen Cays (introduced ~10 years ago). Population surveys of *Cyclura rileyi* on Bush Hill Cay in the northern Exumas and nesting studies of *C.c. inornata* on Flat Rock Reef Cay were also conducted. Blood samples for genetic analysis were collected from all *inornata* populations. The Alligator Cay population has experienced a significant decline in recent years, only small juveniles <25 cm SVL were captured or seen. That population has also expanded to nearby Narrow Water Cay, where signs of very large adults was evident. The population on Flat Rock Reef Cay now numbers over 100 iguanas. Individuals are growing faster and reproductive output is similar to the natural Allen Cays populations, but iguanas on Flat Rock are apparently maturing sooner and reproducing more frequently than in the natural populations. Preliminary population size and growth estimates for *Cyclura rileyi* on Bush Hill Cay were calculated based on survey work over the past five years. Total population size is between 300 and 400 individuals, and growth rates suggest that juveniles reach 20 cm SVL (the probable size at maturity) after five years in males and eight years in females.



Ctenosaura similis on *Utila*. Photo by Jeff Lemm.

Rapid Ecological Assessment for Iguanas (*Cyclura cychlura cychlura*) on South Andros Island. Charles Knapp (Zoological Society of San Diego).

A 2007 assessment of South Andros Island was conducted to document comprehensive distributional patterns for the Andros iguana (*Cyclura cychlura cychlura*). This assessment was timely because a 2006 evaluation of the west side of North Andros Island revealed low iguana presence in the area. Despite this information, plans were developing to recognize the area as a priority for establishing national parks. Without a formal assessment of South Andros Island, comprehensive data were lacking necessary to identify critical conservation zones across the entire island. Therefore, objectives for this assessment included 1) locating areas of relatively high iguana density and correlating density with environmental variables, and 2) conducting general herpetofauna surveys to produce species distribution lists. Teams conducted visual encounter surveys from 30 sites located south of Lisbon Creek. We visited up to seven sites per day for 10 to 120 minutes. A total of 68.3 person hours (0.5 to 8.0 person hours per site) was tallied searching for iguanas. Ninety-seven iguanas were observed at 19 sites (63% of 30 sites), while recent tracks were observed at another site. No feral animals were observed from any location. The isolated small and large cays of the southern area of Andros are relatively pristine in comparison to North Andros. No roads exist in these areas and feral pigs are non-existent. Additionally, commercial logging practices have never been initiated in the area. These isolated areas support the largest pines remaining in the Bahamas and are areas of high conservation priority for iguanas. Based on this survey and past research, large protected areas should encompass Sandy Cay in South Bight and adjacent Alcorine Cay down to Grassy Creek.

