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Ricord's Iguana (*Cyclura ricordii*) on Isla Cabritos.

Conservation of *Cyclura ricordii* in the Southwestern Dominican Republic and a Brief History of the Grupo Jaragua

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Photographs by Ernst Rupp unless otherwise indicated.



After the IUCN SSC Iguana Specialist Group drafted a species recovery plan for Ricord's Iguana (*Cyclura ricordii*) during a workshop in Santo Domingo on 17–18 November 2002, Grupo Jaragua (GJ) began systematically searching for populations on the Barahona Peninsula. Work was initiated in December 2002 by looking for informants who would share their knowledge of the species. Subsequently, GJ scheduled field trips to verify the information.

On 8 April 2003, we found the first signs of a Ricord's Iguana. They consisted of a head, a stomach, and the intestines

of a freshly killed animal. The body was gone. Somebody had taken it, possibly with the intention of preparing a meal. Since then we have been able to find more animals, live ones, their dens and nests. Major help in making these discoveries accrued from the integration of a young man from Pedernales into our research team. His name is Miguel Mella Pérez. Salvador (the Savior), as he is commonly known, never had a formal education. He spent most of his youth hunting and trapping iguanas with his uncle "Turco," who was a folkloric figure who made a living catching and selling iguanas. Turco was killed in a gun-



Young Ricord's Iguanas (*Cyclura ricordii*) are testament to successful recruitment into extant populations.



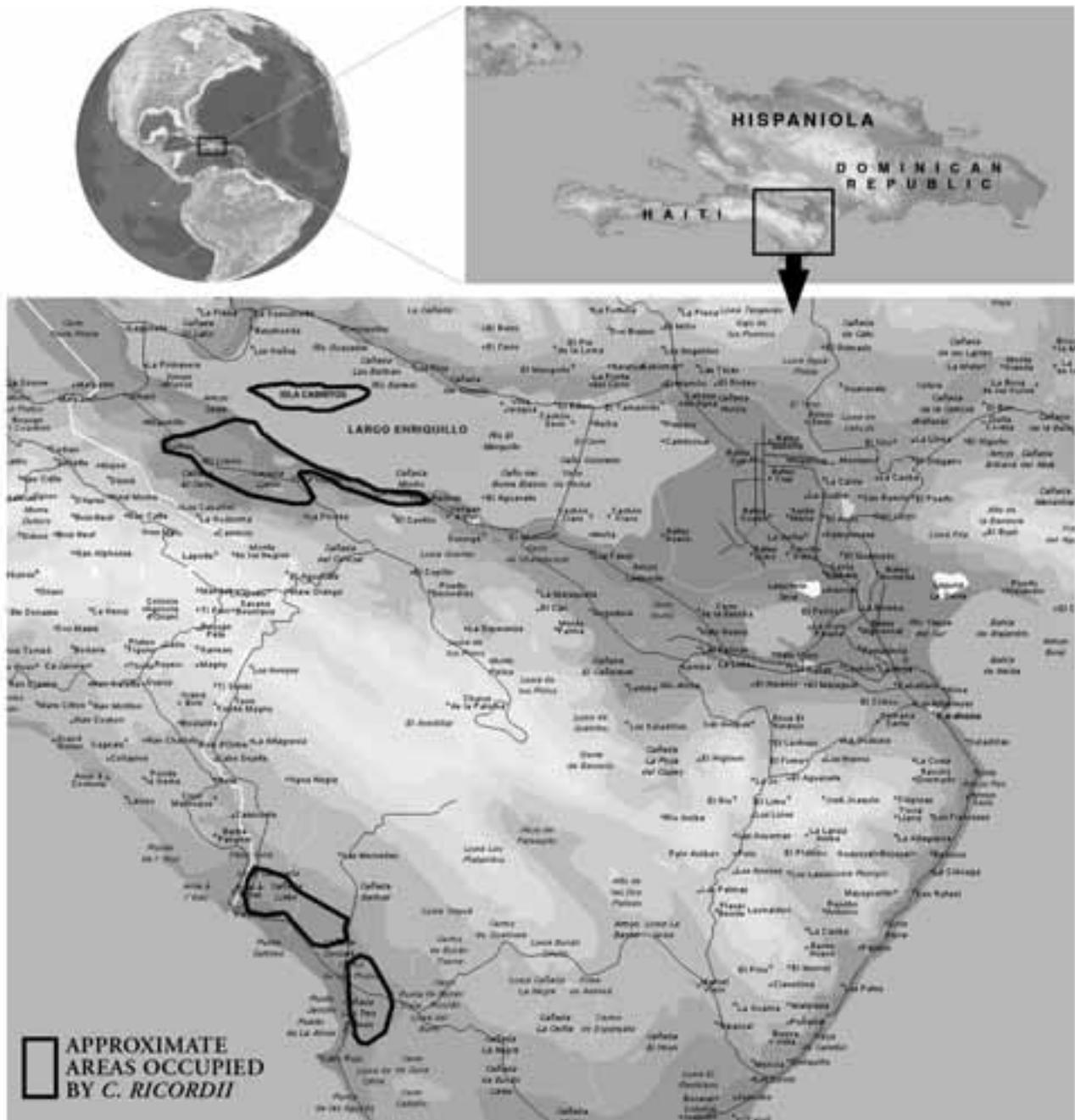
Salvador (Miguel Mella Pérez) with a Rhinoceros Iguana (*Cyclura cornuta*).



Pirín (Jairo Isaa Matos Arache) measuring the depth of a *Cyclura ricordii* nest.

fight 17 years ago when he tried to recover some of his stolen goats. Salvador is still pursuing iguanas, but now for the good of the species. With his gift of patient observation, he has acquired an immense knowledge about iguanas that has helped us to compile valuable data needed for the conservation of the species. Also strengthening our research efforts was the involvement of Jairo Isaa Matos Arache. Pirín, as we call him, made it to 3rd grade. He spent many years trying to make ends meet by burning and selling charcoal. Now he is dedicated to conservation work. He is an excellent field assistant with a natural curiosity. He has been crucial in developing the simple methods that we use in our research on nesting ecology.

On the Barahona Peninsula, *C. ricordii* can be found in an area of about 32 km² just to the east of the town of Pedernales. The area surrounds a low alluvial plain called “Los Olivares,” which consists of fertile reddish soils. During the past 30 years, Los Olivares (8 km²) has been successively cleared to make way for agricultural production under irrigation. Unfortunately, this area also has been the major living and nesting grounds of *C. ricordii*. According to Salvador and other local residents, the species maintained high population densities in Los Olivares before clearing began. The species is now confined to the periphery of Los Olivares, an area that consists of a mosaic of smaller depressions filled with reddish soils (fondos), marine terraces of limestone rock, and intervening areas covered by gravel and boulders. Although of less value for agriculture, this periphery is conducive to the production of free-ranging cattle. The land in the area is owned by the state. In 2003, it had no legal protec-



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Map of the southwestern Dominican Republic showing the areas where Ricord's Iguanas (*Cyclura ricordii*) are known to occur.

tive status, and persons with the necessary financial means often enclose state land with fences before clearing it and then declaring it to be their own property.

Pedernales is a small border town with a population of about 12,000. The jobless rate is above 50%. The proximity to impoverished Haiti aggravates the economic situation. Many Haitian citizens are illegally crossing the border trying to earn a meager living by clearing land to produce short-term crops or burn charcoal.

Limestone mining and the production of cement in the Cabo Rojo area have generated some income during the past two years. Bauxite mines in the lower regions of the nearby Sierra de Bahoruco also have been reopened. These activities,

though economically beneficial to a small percentage of Pedernales residents, have had a high environmental cost in the form of dust pollution and destruction of iguana (*C. cornuta*) habitat.

Being aware of the imminent danger of more destruction of remnant *C. ricordii* habitat, GJ decided to initiate conservation measures based on a bottom-up approach. The basic principles of this approach are: (1) Integration, participation, and empowerment of the main stakeholders in the local community in the conservation process. (2) An effective educational program to inform and convince the local community of the importance and value of endangered species. (3) Conservation activities that generate economic benefits for the community.



Hatchling *Cyclura ricordii* in the Fondo de la Malagueta, about 5 km northeast of Pedernales.

A local support group has been formed. Members of this group are young women and men from Pedernales, whose love for nature has committed them to conservation. GJ has provided logistical support and training as nature guides. The principal person responsible for this process is Laura Perdomo. Laura never seems to get tired and never stops smiling. She studied veterinary medicine at the Universidad Nacional Pedro Henríquez Ureña, Santo Domingo, and holds a Master's degree in Management and Conservation of Wildlife from the Universidad Nacional de Heredia, Costa Rica.

The local support group has formed its own association of nature guides (AGUINAPE). Apart from showing visitors the wonderful and unique natural attractions around Pedernales, they also are involved in environmental education in local schools and run a radio program to inform the general public of environmental issues. AGUINAPE plays an important role in the strategy of promoting ecotourism in the southwestern region of the country, which has been declared a Biosphere Reserve by UNESCO. Strong pressure exists from influential political groups to bring mass tourism to the region and turn the last pristine beaches into high-capacity resorts. GJ has been spearheading a resistance movement to counteract those plans and to develop alternative tourist concepts that keep intact the natural resources of the region. In May of this year, the members of the town council of Pedernales voted in favor of a resolution that declares their hometown a "Town of Sustainable Tourism." This resolution was the result of a process involving intense discussions by local stakeholders, including small business entrepreneurs, to decide their own future. They decided in favor of sustainable tourism.

The town council passed another resolution in September. This establishes two "Espacios Municipales Protegidos" (Municipal Protected Areas). One involves wetlands close to Cabo Rojo that serve as an important bird sanctuary. The other, with an area of 85 km², covers most of the presently known *C. ricordii* range north and east of Los Olivares as well as a fairly extensive buffer zone. A nature path is being built to allow visi-



Hatchling *Cyclura ricordii* in the Fondo de la Malagueta, about 5 km northeast of Pedernales. The nest was excavated between 19 May and 1 June 2004. Emergence of the hatchling occurred on 2 September. How long the hatchling spent in the nest after hatching is unknown.

tors to actually watch Ricord's and Rhinoceros iguanas in the adjacent marine terrace. Members of AGUINAPE will guide tourists on the path, and Salvador is providing the necessary training to find and correctly identify animals at a distance.

Two other local groups have access to the protected areas. One is the "Asociación de Bosque Seco" (Dry Forest Association),

which extracts dead wood from the northern part of the protected area, where vegetation is denser. This association had been active in the zone long before the protected area was declared. To stop their activities would have created a social conflict that may have put in jeopardy the success of the resolution. The other group consists of beekeepers who are allowed to place hives in



Laura Perdomo (center) on an excursion with nature guides from Oviedo.



Members of AGUINAPE during their general assembly meeting. Esteban Garrido is on the left, second row.



Alcibiades Ledesma and Ernst Rupp discussed the resolution of protected areas with the mayor and members of the town council of Pedernales well into the night.

designated spots. Fences are presently built in strategic areas to prevent entry into the area by free-ranging cattle.

The man responsible for the lobbying that was necessary to convince the mayor and members of the city council of the importance of establishing a protected area for Ricord's Iguanas is Alcibiades Ledesma. He was born in Pedernales and is an agricultural engineer by profession. He is the director of the "Unidad de Gestión Ambiental Municipal" (Municipal Environmental Unit) and is responsible for the improvement of environmental conditions in and around Pedernales. His love for and dedication to the local flora and fauna make him a valuable ally. Another important ally has been the Vice-secretary of Protected Areas and Biodiversity of the Ministry of Environment and Natural Resources, Angel Daneris Santana, who has cleared the legal pathways in order to establish the local municipal protected areas.

While Ricord's Iguanas may have gained some time and space to breathe more freely on the Barahona Peninsula, the situation for the population along the southern shore of Lago Enriquillo is still uncertain. In May 2005, GJ began focusing considerable attention on that area. We have found juveniles and adults, but the actual distribution of the species in that region has not yet been studied.

The future of the species may be bleak for those iguanas. The area has no legal protected status. The vegetation where Ricord's Iguanas are found is impoverished. Intensive charcoal burning in the past seems to have taken a heavy toll on the original flora. Today, vegetation is dominated by only a few species



Sixto Incháustegui with Gloria Santana and other colleagues during field work at Enriquillo Lake.

(*Prosopis juliflora*, *Cylindropuntia caribaea*, *Opuntia moniliformis*, and *Cephalocereus polygonus*).

Trapping of iguanas and excavation of their dens also appears to be a major problem. Signs of these activities can be seen everywhere. The problem is aggravated by the fact that people in the area believe that iguanas are a deadly threat to young goats. According to well-circulated stories that have never been substantiated, iguanas crawl under the bellies of young goats, rip the bellies open with their sharp crests, and supposedly eat the goats. Overcoming such notoriety is difficult, and goat owners are not very happy to find iguanas in close vicinity to their animals.

In addition to all the problems already listed, habitat destruction is rampant. Just recently, the senator of the province ran a bulldozer through the area and opened up a 4 km-long



“Pet” *Cyclura ricordii* in the town of Baitoa on the southern shore of Lago Enriquillo.

strip with the intention of clearing the land for agriculture. This illegal action within a RAMSAR Site has been denounced by the Ministry of Environment and Natural Resources, which has taken legal action against the senator. The case was highlighted by the press and constituted one of the biggest recent environmental scandals in the country. Nevertheless, the damage has already been done.

In a situation where the majority of the people are without a stable income, clearing land for agricultural production is often popular and is perceived as an appropriate measure for improving the local economy. Sustainable alternatives are not considered.

With traditional beliefs that justify persecution of iguanas and a senator, who is a popular political figure, destroying iguana habitat to increase agricultural production, the task of securing a future for *C. ricordii* on the southern shore of Lago Enriquillo does not appear very promising — but this task is a challenge which has to be met.



Excavated *Cyclura ricordii* den on the southern shore of Lago Enriquillo. Note also the new den of a smaller animal in front of the dog.



Gravid female *Cyclura ricordii* in search of a nesting site near Pedernales.

The challenge of conserving Ricord's Iguanas, Rhinoceros Iguanas, and other endangered species and habitats is complex and inevitably of long duration. We cannot save the iguanas by focusing solely on them as individual species. The southwestern Dominican Republic is one of the most important biodiversity sites not only of Hispaniola, but also of the entire insular Caribbean. For this reason, the first biosphere reserve of Hispaniola was established there. Jaragua Bahoruco Enriquillo Biosphere Reserve extends from Beata and Alto Velo Islands across the flat limestone plateau of the Barahona Peninsula, over the Sierra de Bahoruco, and into the lowlands of the Neyba Valley, the location of Lago Enriquillo.

Having a biosphere reserve established in the region has been the result of hard work by many individuals over the past 25 years. Many Dominicans and foreigners have contributed to the knowledge of the region's biodiversity. Many species new to science have been discovered, and more new species continue to appear. One of the most important, primarily for the resultant international attention garnered, was the discovery of the Jaragua Dwarf Gecko (*Sphaerodactylus ariasae*), the smallest known tetrapod in the world. This diminutive lizard was discovered in Jaragua National Park and named after Yvonne Arias, in recognition of her work for biodiversity and conservation.

The National Parks Department was legally created in 1974 (now included, since 2000, in the Ministry of Environment and Natural Resources). In 1983, the protected areas system was expanded beyond the five parks included in 1974 (one of which was Jaragua National Park). A management



S. BLAIR HEDGES

The Jaragua Dwarf Gecko (*Sphaerodactylus ariasae*) is the smallest known tetrapod in the world.

IGUANAS AND EDUCATION

John Foster

Indianapolis Zoo

Ricord's Iguanas (*Cyclura ricordii*) are mysterious creatures found only in the Dominican Republic. The majority of Dominicans who have an awareness or understanding of the creature are park rangers and those individuals who hunt iguanas for food. An additional handful of Dominicans are working to expand our understanding of these creatures, both in terms of field conservation and captive husbandry. Although the body of knowledge regarding Ricord's Iguanas continues to expand, most Dominican citizens are unaware of the species' existence — and this has the potential to be problematic. Gaining support to protect habitat for an endangered species that no one has ever heard of and certainly not seen is, at best, very difficult.

To begin to address the unknown lizard phenomenon, a partnership has been established between Grupo Jaragua, a major NGO conservation group in the Dominican Republic, ZooDom, the National Zoological Park, and the Indianapolis Zoo. This partnership was formed in order to develop curricular materials and a resource kit that could be used by elementary school teachers in the Dominican Republic. The partners met in 2004 in order to establish goals for the curricula and identify educators' needs.

U.S. Fish and Wildlife and AZA Conservation Endowment Fund grants funded the development of curricular materials. These grants not only helped underwrite curricular development and teacher resource kits but expenses associated with implementing teachers workshops. The curricula will allow teachers to take their students on an exploration of Ricord's Iguana natural history and conservation threats through games, simulations, and other activities while simultaneously strengthening math and language arts skills.

Teacher training workshops will be held in two geographic regions. ZooDom staff will lead workshops for teachers in and around Santo Domingo. Grupo Jaragua staff will conduct similar activities for teachers whose students live "sympatrically" with Ricord's Iguanas in the southwestern Dominican Republic. When all the workshops are conducted, 400 teachers will have been trained to use the materials. The partners hope that as we expand our knowledge and ability to conserve Ricord's Iguanas, we will have helped build a community that values these animals and supports activities to conserve them.



Two-year-old *Cyclura ricordii* in the Fondo de la Malagueta, about 5 km northeast of Pedernales.

plan was published in 1986. Immediately thereafter, a group of concerned citizens, mostly biologists, working in different governmental agencies and universities, explored options for providing permanent support of Jaragua and other parks and biodiversity in general. After a year of discussions and reflections, the Grupo Jaragua, a Dominican Biodiversity Conservation NGO, was established. GJ is now one of the leading organizations to have contributed significantly to the preservation of the nation's natural resources.

Sixto J. Incháustegui served as its first president. Sixto is a Dominican biologist, who was committed to conservation even before he started college. He had the opportunity, for instance, to participate in the release of Green Turtle hatchlings sent to the Dominican Republic Marine Biology Institute from Dr. Archie Carr's program in 1968. The same year, he made his first trip to the southwest, where he visited Isla Cabritos in Lago Enriquillo

with Michael Carey. That visit was coordinated by Albert Schwartz, arguably the "dean" of West Indian herpetology, and recounted by Sixto in a recently published essay (see references).

Yvonne Arias is another founding member of the organization who has been actively working in biodiversity research, conservation, and education since the 1970s. She succeeded Sixto as president of GJ. She feels as comfortable discussing biodiversity problems with the president of the country, ministers, congressmen, and mayors of local governments as with fishermen, farmers, and the women and children of local communities. She has created the very popular Jaragua Environmental Educational Summer Camps for children from local communities in the region. The eighth camp took place this past summer.

In 2001, Ernst Rupp joined GJ. Ernst is a strange mixture, as are many who are devoted to conservation. After years of being in business administration, he studied agrobiology in his native Germany. After visiting the Dominican Republic for the first time in 1984, he has served in various positions, all directly related to local development and conservation, throughout the country for 13 years.

Seventeen years of hard struggle have passed since Grupo Jaragua was established. Gaining the confidence of local citizens has been one of the most important issues, showing them that we are not interested in their lands for short-term personal gain, but are instead interested in understanding and learning from one another, developing programs together for sustainable livelihoods, including those initiatives directly related to iguana conservation.

GJ is presently developing an agroforestry program that has integrated local people from the beginning. It is intended to promote the use of local plant species with economic value. The region, in most cases, is extremely dry with little soil and almost no freshwater. Developing such a program is a real challenge. If successful, it will provide sustainable livelihoods for local people,



KIRSTEN ALLEN

Sixto Incháustegui during a visit to a Cape Town, South Africa biodiversity hotspot during the Fifth IUCN World Parks Congress in 2003.

protect local plant species, and offer habitats for iguanas, birds, and other endangered and endemic plants and animals.

We have learned much through the many programs and projects that we have undertaken over the years, but if we had to highlight one of the most important factors involved in our success, unquestionably it would be local support. Almost from the beginning, GJ has received strong local support. Pericles Mercedes, a well-known primary school director from Oviedo, offered key support. Olga Vidal and Esteban Garrido, residents

of Oviedo, are members of the GJ board of directors. Esteban, in fact, has become one of the best field ornithologists in the country. After several years of work in the southwest, something happened that was quite unexpected to most of us. Youngsters decided to form a volunteer conservation group, Voluntarios Comunitarios de Jaragua, to support GJ's work. This was, indeed, powerful and welcome feedback to our work.

A few years later, another even more relevant event is happening. From those local community children and youngsters

Iguana Breeding Program at ZooDom

Jan Ramer

Indianapolis Zoo

Parque Zoológico Nacional (ZooDom) is the national zoo of the Dominican Republic. Situated near downtown Santo Domingo, the zoo occupies over 250 acres of wooded hills. ZooDom opened in 1975, and has large, wonderful, naturalistic habitats for the many species that live there. They have had very successful breeding programs with a number of species, including both Rhinoceros Iguanas (*Cyclura cornuta*) and Ricord's Iguanas (*C. ricordii*). In the late 1990s, a new Ricord's Iguana exhibit was completed and filled with native plants collected from Isla Cabritos. Under the watchful eyes of General Curator Angelica Espinal, a pair was placed in the exhibit, and as fortune would have it, the first hatchlings emerged during the 2002 ISG meeting in the Dominican Republic. Needless to say, we were all very excited to see these beautiful, critically endangered lizards. Those four babies (three males and one female) are thriving today as juveniles. Since then, the pair produced ten more babies in 2004, all of which were examined and had PIT-tags placed last spring — and all appeared to be healthy and strong.

One of the objectives of the revised Ricord's Iguana SRP is for ZooDom to maintain this breeding pair, learn-

ing as much as we can about breeding behavior, incubation, hatchling development, and any other relevant subject. Another enclosure with a second pair for increased genetic diversity is on the horizon. Congratulations to ZooDom on their successful breeding program.



ZooDom General Curator Angelica Espinal (standing), Head Keeper "Nacho" Nacisso, and the author conducting a physical examination of Ricord's Iguana hatchlings at ZooDom.



Each hatchling Ricord's Iguana was carefully examined, weighed, and measured.



A PIT-tag, donated by the Indianapolis Zoo, was inserted in each hatchling.



Yvonne Arias and Hector Andujar during the last summer camp.



Pirín (Jairo Isaa Matos Arache) working in the nursery for native and endemic plants.

who had been participating in summer camps, volunteer work, and nature guide courses during recent years, some decided to go to college and study biology. Hector Andujar is leading the group. Young, strong, and committed, he is a native of Los Tres Charcos, a community of about 100 houses within the Biosphere Reserve. He currently is in his third year of college. Pablo Feliz, native of El Cajuil, a community of nearly 125 houses near the Laguna de Oviedo, is the son of an entrepreneurial local woman, Chucha, the only fisherwoman in town. Pablo is very different in personality than Hector. He is quiet and relaxed, but equally committed. He is now in his second college year. The list could go on. At present, six young people native to local villages are studying or about to start school in Santo Domingo.

These events have exceeded all of our expectations. I doubt that any of us, although we love our careers in field biology and conservation, ever told any of these young people to become biologists. However, today, they represent the long-term sustainability of GJ as an organization. They represent the sustainability of iguana conservation and the sustainability of Jaragua Bahoruco Enriquillo Biosphere Reserve. They are the new generation of Dominican conservationists. If Ricord's Iguana conservation faces hard times, the unexpected and spontaneous recruitment of young local people into biology and conservation offers the needed means and hope for supporting current and future conservation efforts in the southwestern Dominican Republic.

Acknowledgments

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