The "Rhino Factory" at Manatí Park

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When tourists visit the rapidly developing eastern coast of the Dominican Republic (DR), they cannot help but notice signs inviting them to visit Manatí Park, an 8-hectare site where they can swim with dolphins, interact with snakes, parrots, or other animals, learn about the history and culture of the West Indies, or merely have a good time. Our recent (January 2002) visit, however, was motivated by a more limited agenda, namely the opportunity to experience first-hand the iguana facility which has and continues to be phenomenally successful at breeding the Hispaniolan endemic Rhinoceros Iguana, *Cyclura cornuta*.

"Not only is it by far the best exhibit in the park, it's a virtual iguana factory."

The Manatí Park logo that adorns the many signs directing visitors to the Park.

Manatí Park is in Bávaro, a rapidly developing resort area near the easternmost tip of the DR. The Park opened in 1997, coinciding with a major tourist boom in the region, fueled largely by the development of an international airport at Punta Cana. Club Med pioneered the area, which now is festooned with nearly 30 major resort hotels, most of them offering all-inclusive services, upscale lodging and activities, and access to some of the most beautiful beaches in the Caribbean. Although traditional travelers seldom stray from the grounds of all-inclusive resorts, the more adventurous seek to experience the local ambiance, getting to know something about the culture into which they've ventured and maybe even learning a little about an area's natural wonders.

However, access to much of the eastern DR is limited to a few main roads that serve the larger towns. Parque Nacional Los Haitises is not far, but accessible from the east only by boat. Parque Nacional del Este also is geographically closeby, but paved roads merely lead to the park boundaries. Both are characterized by harsh landscapes, prickly plants, and oppressive heat. Although both parks serve effectively as reservoirs for native species, only the hardiest of tourists would consider even a brief visit. Consequently, Manatí Park provides a real service. Not only is the visitor entertained by its attractions, they can experience animals in a very personal way and learn something about conservation in the process.

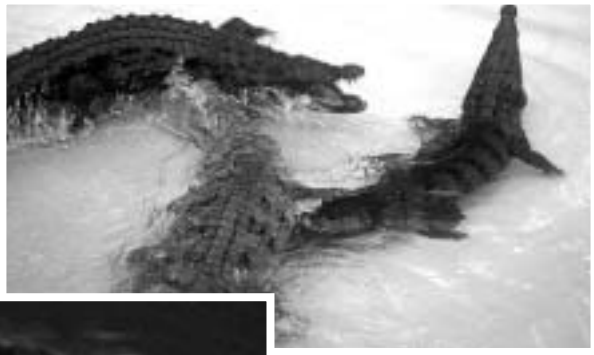
The Spanish developers of the Park had envisioned a facility that would provide entertainment and educational opportunities while remaining

actively engaged in conservation. Entertainment would be provided by dolphins and sea lions, dancing horses, and parrot shows. Education would focus on native animals, their habitats, and the region's Taino heritage (the Tainos were the original human settlers of the islands that Columbus first encountered in 1492). Conservation goals would address the needs of threatened or endangered Dominican species through education and by providing an ideal habitat within the Park boundaries (the native vegetation planted in what had been a severely disturbed site supports many species of birds, insects, and reptiles, including the very rare and poorly known endemic snake, *Ialtris dorsalis*).

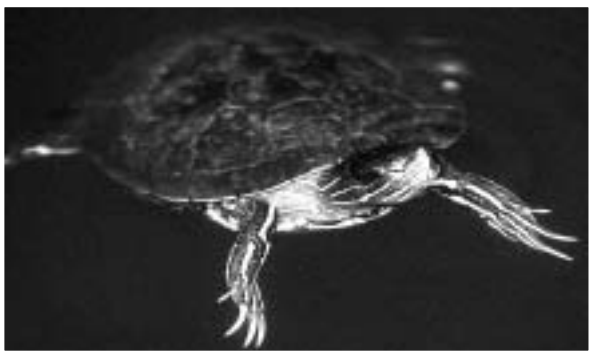
The Bávaro area was ideal for such an enterprise. New resorts are springing up like weeds, providing a steady supply of the tourists on which the Park depends for its economic well-being, a suitable infrastructure exists or is being developed, and the DR has a plethora of species that are unique, appealing, and often in dire need of conservation. Believing that conservation begins with education and that the best way to educate the public is to combine opportunities for up-close encounters with selected species and more traditional tourist activities, the developers brought their vision to the DR, where they made the fortunate decision to seek help and advice from Dr. José Alberto Ottenwalder.

Map of the eastern Dominican Republic. Black dots indicate published locality records for *Cyclura cornuta*.

Dr. Ottenwalder combines extensive experience with zoos and a background in conservation biology. Among other qualifications, he was the



Most natural Hispaniolan populations of American Crocodiles (*Crocodylus acutus*) have been extirpated. *Photograph by Robert Powell.*



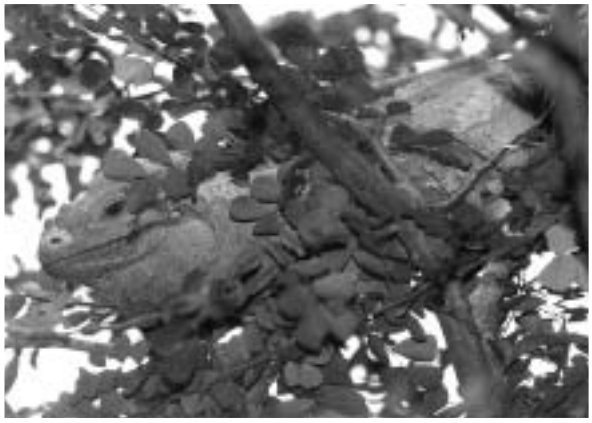
Hicotecas inhabit many of the aquatic exhibits. This Greater Antillean Slider represents an endemic subspecies, *Trachemys stejnegeri vicina. Photograph by Robert Powell.*

Very little is known about the endemic Hispaniolan snake, *Ialtris dorsalis* (*photograph courtesy of R.E. Glor*).

The density of the Rhinoceros Iguana population in the exhibit is possible only because of its complex design, which provides visually distinct areas for territorial males. *Photographs by Robert Powell.*

director of research at ZooDom, the Dominican National Zoo, for some years and, more recently, has served as director of the National Environmental Policies Reform Project and the National Biodiversity Strategy and Action Plan of the DR and as co-chair of the IUCN/SSC West Indian Iguana Specialist Group (now the Iguana Specialist Group). Dr. Ottenwalder was instrumental in designing the exhibits for sea turtles, Greater Flamingos (the Dominican population of which has shown recent signs of recovery), hicotecas (West Indian Slider Turtles that are threatened by human exploitation and hybridization with the increasingly common Red-eared Sliders that are appearing in the region), and American Crocodiles (the Hispaniolan populations of which are essentially limited to two saline lakes, one in Haiti and one in the DR). The jewel of the Park, however, is the exhibit devoted to Rhinoceros Iguanas.

Designed to provide interactive opportunities for Park visitors and to serve as an effective breeding facility for this endangered species, the exhibit exploits the local climate (to which the iguanas are obviously well-adapted) by incorporating native vegetation while simultaneously providing adequate space for the establishment and defense of territories by male iguanas. The multi-tiered exhibit is built on a foundation of sand and gravel to allow adequate



(Above) An iguana exploiting the natural vegetation in the exhibit. *Photograph by Robert Powell.*

(Left) Visitors viewing iguanas from a bridge high above the exhibit. *Photograph by Robert Powell.*

Brief Notes on the Status of Hispaniolan Rhinoceros Iguanas, *Cyclura cornuta*

José Alberto Ottenwalder and Robert Powell

Rhinoceros Iguanas have a broad but disjunct distribution across Hispaniola. Populations in Parque Nacional Jaragua on the lower Barahona Peninsula and in Parque Nacional Isla Cabritos (and nearby shorelines of Lago Enriquillo) are stable and show signs of increasing in numbers. Protected status, the inaccessibility of much of the lower Barahona Peninsula, and education efforts directed primarily at the inhabitants of villages around Lago Enriquillo have apparently combined to produce this currently rosy picture.

Elsewhere the outlook is less bright. The status of Haitian populations has not been assessed recently. Most are probably in decline and many may have been extirpated as a consequence of continued human exploitation and habitat degradation attributable to a growing population engaged in subsistence agriculture and charcoal production. Combined with a lack of ability or interest on the part of the government to enforce existing laws, the future of those populations still remaining appears grim.

Isolated Dominican populations may be holding their own in portions of the Valle de Neiba and possibly in the drier regions of the Samaná Peninsula. However, the status of those found in the north near Monte Cristi and Puerto Plata and those in the eastern Dominican Republic range from being definitely in decline to having an undetermined status. Suitable habitat in inaccessible regions of Parque Nacional del Este may support viable populations, but sightings there and elsewhere are rare and consist almost exclusively of large adults. If population densities are too low to facilitate sufficiently frequent contact (i.e., breeding) to sustain numbers, those populations are in danger of extirpation when the few remaining adults die.

Recent evidence showing two distinct genetic haplotypes among Dominican Rhinoceros Iguanas and indications that one of these may reflect the eastern populations emphasize emphatically the need to study and preserve these isolated populations, populations that might represent a unique genetic heritage.

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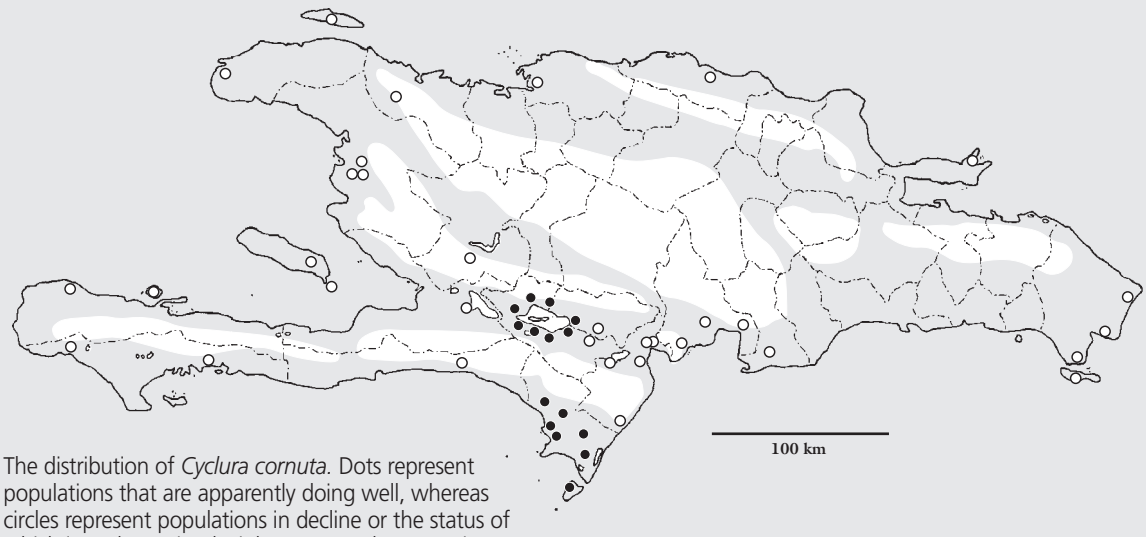

The distribution of *Cyclura cornuta.* Dots represent populations that are apparently doing well, whereas circles represent populations in decline or the status of which is undetermined. Light areas mark mountain ranges.

Hatchling Rhinoceros Iguanas. *Photograph by Robert Powell.*

drainage even if hurricanes should strike the region. The tiers provide an interactive zone where visitors can brush by the largely uninterested iguanas that rapidly adapted to the human "invaders" of their territories, areas that are visually distinct to allow the territorial males to maintain separate domains, and refuges where the iguanas can escape human activity and go about the business of eating, breeding, or nesting. Only native soils were used, both to support the largely natural vegetation and to ensure nesting success. Artificial burrows and nesting sites are provided — and are used extensively, but the iguanas also have honeycombed the exhibit with their own excavations.

Visitors may view the exhibit from its periphery, from an elevated bridge over the compound, or by taking a guided tour through the lower, interactive zone. Signs provide insights into the species' biology and address conservation concerns. During tours, visitors are introduced to individual iguanas and to iguana behavior and natural history while being exposed to a message fostering conservation — a message that is all the more likely to be meaningful, if only because its impact is enhanced immeasurably by the presence of too many iguanas to count.

The resident iguana population was established when animals were acquired from ZooDom and released into the exhibit. With only two exceptions (rescued animals of unknown origin), all of the specimens visitors see are either original acquisitions or their descendants. The iguanas took to the compound like the proverbial duck to water. Seasonal breeding activity was initiated almost immediately after introduction and the iguanas have yet to stop.

Strategically placed logs provide the iguanas with ready access to the higher tiers. *Photograph by Robert Powell.*

Eggs are removed from the exhibit and incubated on site. Hatchlings are held in a separate enclosure not open to visitors, but are transferred to a smaller exhibit each year to make room for new arrivals. In 2001, two-year old animals in the smaller compound bred, nested, and produced eggs. That such young animals breed successfully is testament to the Park's capabilities. Combining an ideal climate, a diet based largely on local

Species Profile: *Leiocephalus personatus*

Curly-tailed Lizards of the genus *Leiocephalus* are found only in the West Indies and have recently been assigned to their own family, the *Leiocephalidae*. Curly-tails range from the Cayman, Bahama, and Turks and Caicos islands to Cuba and Hispaniola. An extinct species is known from Martinique in the Lesser Antilles. Species range in size from the diminutive *L. semilineatus* of Hispaniola (maximum known snout-vent length = 53 mm) to *L. carinatus* of Cuba, the Bahamas, and the Cayman Islands and *L. melanochlorus* of Haiti (maximum SVL = 130 mm). The common name is derived from the fact that, when perching, these lizards curl their tails either vertically or horizontally, depending on the species. The reason for this unusual behavior is unknown, but suggestions have included using the moving tail to lure food, communicating with conspecifics, or confusing a potential predator. No real evidence supports any of these hypotheses.

Leiocephalus personatus is widely distributed in mesic regions of Hispaniola. Size is moderate (maximum male SVL = 86 mm). Twelve subspecies have been described in what is most likely a species complex, with *L. p. mentalis* found along the easternmost coast of the Dominican Republic in the vicinity of Manatí Park. Like others in the complex, males of this species have dark face masks (that vary in intensity by subspecies) and lack ventral markings. In contrast, the females are characterized by many dark gray to black dots on the throat and belly. The most striking feature of lizards in these eastern Hispaniolan populations is the brilliantly bright yellow chin and throat of males. Like tail-curling, no one knows for sure if this color serves any purpose, but species recognition and intraspecific communication are the most likely explanations.

Along the eastern Dominican coast, these lizards are very common along beach dunes, using driftwood or debris as elevated perches for basking or surveying territories. Curly-tails are quite wary and resist a close approach. When frightened, they seek shelter under cover of rocks, logs, or flotsam. On our recent trip, the first individual we collected had sought sanctuary in an old tennis shoe, effectively trapping itself, and rendering capture as easy as picking up a piece of trash.

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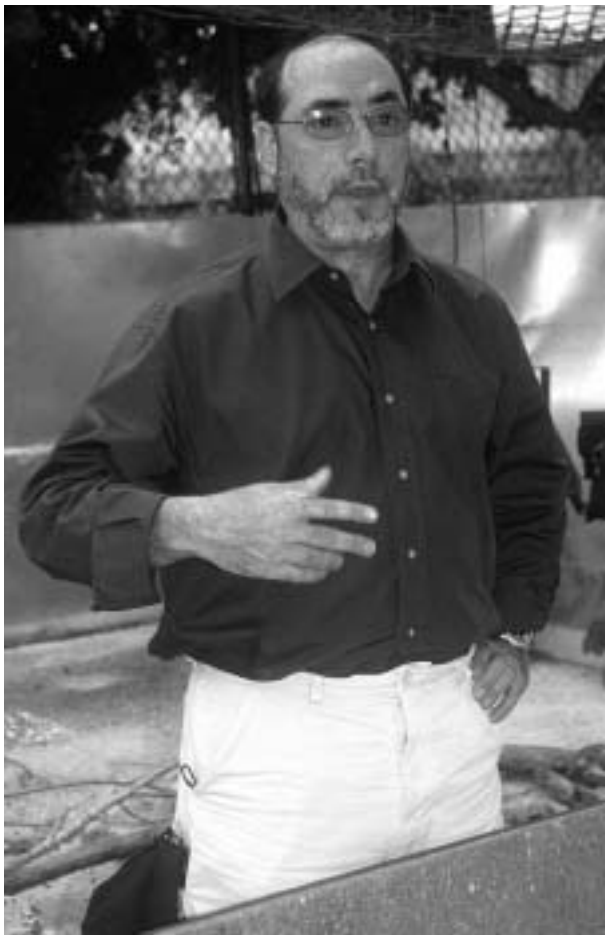
Male (top) and female *Leiocephalus personatus mentalis* from Juanillo, La Altagracia Province, Dominican Republic. Note the very distinct face mask and bright chin and throat of the male, and the spotted chest and curled tail of the female. *Photographs by Robert Powell.*

plants, and excellent husbandry supervised by Dr. Ottenwalder, the iguanas of all ages are thriving. One comment heard during our visit was that, "Not only is the iguana exhibit by far the best exhibit in the park, it's a virtual iguana factory."

Although the Park is a commercial enterprise, the offspring are not for sale. Instead, they will become part of a captive gene pool that will function as a source of these animals for educational and research facilities and for head-started animals to supplement depleted natural populations.

By providing visitors, tourists and Dominican nationals alike, with an opportunity to learn more about their threatened natural heritage, the Park functions as an educational resource served up on a tasty platter, one designed to leave a pleasant taste and a permanent impression — and one that will hopefully help to alleviate the plight to which the natural populations of many of the Park's residents are currently subjected. Manatí Park is an exemplary model that many zoos and theme parks, especially in developing nations, should emulate.



Dr. José Alberto Ottenwalder in the hatchling enclosure. *Photograph by Robert Powell.*

The exhibit for young iguanas, where iguanas bred successfully in their second year. *Photograph by Robert Powell.*