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A male *Ctenosaura bakeri* (Swamper or Utila Iguana) on Utila Island, Honduras, March 2003. Photograph by John Binns.

# Stout Iguanas: Historical Perspectives and Status Report

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(All photographs are by the author unless otherwise indicated)

## Anegada

R.H. Schomburgk first noted the presence of *Cyclura pinguis* (Stout or Anegada Iguana) on Anegada in 1832, but literature documenting the status of this species has been sparse. However, each progressive publication has described or implied an ever-increasing concern for its survival. Accounts from the 1940s and 1950s are essentially non-existent. By the early 1960s, large-scale development was planned for Anegada. Although these plans were never fully realized, the initial ground-work destroyed the traditional stone paddocks used to corral livestock, unleashing goats, sheep, cattle, and burros to roam and propagate freely. Excessive grazing has since reduced the natural plant community to secondary, largely toxic vegetation. Today, almost all free-ranging cattle and burros are emaciated and only goats are thriving.



This Anegada Iguana was estimated to be over 20 years old.

In 1968, W. Michael Carey conducted a field study on the ethoecology of the Stout Iguana and, in his classic 1975 paper, stated: "whatever the methods, steps must be taken now to ensure the continued existence of *C. pinguis* on Anegada."



Emaciated cattle are a common sight on Anegada. Although the vegetation appears rich, the plant matter is all secondary growth.

This statement was based in large part on his observations of competition for available food between Stout Iguanas and livestock and of predation on iguanas by domestic mammals.

Following Carey, James Lazell worked with Stout Iguanas in 1980 and 1982–1986 and Numi Mitchell worked with them in 1987–1996. Glenn Gerber, then with the University of Tennessee and presently with the Zoological Society of San Diego, began working on the species in 1998 under auspices of the IUCN/SSC Iguana Specialist Group (now funded by the International Iguana Foundation) and the British Virgin Islands National Parks Trust (BVINPT).

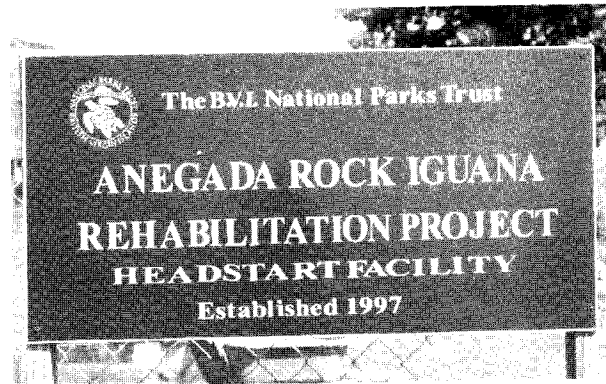
James Lazell first observed Stout Iguanas on Anegada in 1980 while employed by The Department of Natural Resources and the Environment (DNRE), Government of the British Virgin Islands. Expecting to find large densities at Citron Bush, the site of Carey's 1968 study, he instead found that iguanas had completely disappeared from the area in the intervening 11 years. Lazell subsequently found the highest remaining



Aerial photograph of Bones and Windlass Bight, Anegada, BVI. This small stretch of land that lies between the ocean and salt ponds is the only core Stout Iguana habitat left on Anegada. Access cuts as well as the main road passing through the area are visible in the photograph.

concentration of iguanas at Bones Bight, which today remains one of the core areas for the species.

Carey's warning was reiterated by others, but efforts to fund the removal of livestock and feral predators remain mostly unsuccessful, despite some recent activity. In 1997, concrete efforts to secure the species' future materialized in the form of the Anegada Iguana Headstart Facility. In October 1997, at the request of BVINPT, West Indian Iguana Specialist Group (WIISG) members Rick Hudson (Fort Worth Zoo), Jeff Lemm (San Diego Zoo, CRES), and Rondel Smith (BVINPT) constructed a small facility to house three juvenile Stout Iguanas found floating in Manhead Pond. The facility provides a safe haven for collected



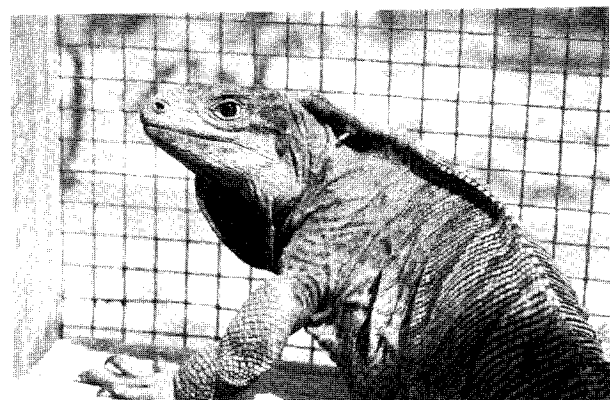
The Anegada Iguana Headstart Facility's new sign is displayed proudly at the entrance.

hatchlings until they are large enough to reduce the threat of feral predators. A year later, a grant from the UK Foreign Commonwealth Office to the BVINPT and WIISG T-shirt and poster sales funded construction of the main complex by Rick Hudson and Jeff Lemm, joined this time by Mike Fouraker and Glenn Gerber. In August 2001, the International Reptile Conservation Foundation (IRCF) and the BVINPT funded an upgrade to the facilities to increase captive capacity. Team members for this project were John and Sandy Binns (IRCF), Alberto Alvarez (PR-DNRE), Juliann Sweet, Joel Friesch (IRCF), and Rondel Smith and Lee Vanterpool (BVINPT).

To date, none of these head-started captives have been released into the wild, but a limited release on Anegada, coupled with the relocation of a few captives to a neighboring island, has been discussed. In conjunction with this dialogue, a population assessment of Stout Iguanas is planned



The Anegada Iguana Headstart Facilities currently hold about 80 captives. The two structures at the front left are new cages located close to the gate, allowing visitors to view these rare animals. The main cage system lies behind these new cages. Current keepers, Rondel Smith and Lee Vanterpool, have made substantial improvements and all animals are in good health.



This five-year-old captive Anegada Iguana is one of the older animals at the facility. Captive iguanas at the facility tend to be smaller than iguanas observed on Guana and Necker in the same age groups.



Fallen Jerusalem, BVI: this small island is a possible relocation site for some of the head-started animals on Anegada. This island, with no feral livestock, is well fortified with large rock boulders that offer a degree of protection during heavy storms and hurricanes.

during July 2003 to update the previously published estimate of fewer than 200 remaining in existence.

Controlling livestock or feral predators on Anegada is nearly impossible due to the island's remote location and the tens of thousands of dollars that would be required. So, in 1980, in light of the obviously rapid and apparently unchecked decline of the iguana population during the previous decade, Lazell and his colleagues believed that the species was headed for extinction — unless something was done immediately. Because a solution on Anegada was not feasible and Anegada was the only place where the species still existed, the obvious recourse was to establish a second population — but where and by what means?



Heavily degraded habitat on the East End of Anegada near Crasy Pond once supported subpopulations of Stout Iguanas. In 1984, the DOA converted a deep freshwater limestone solution hole called "The Fountain" to an above-ground watering hole, providing a permanent water source for feral livestock. Recent surveys in and around the East End suggest that Stout Iguanas have been extirpated.

## Guana

Essentially all possible relocation sites in the British Virgin Islands were equally infested with feral predators and goats. However, in 1932, Chapman Grant had noted the presence of iguanas on Guana Island and had identified the species as *Iguana iguana* (Common or Green Iguana), but the presence of that species was never confirmed and none has been seen since. Sometime in the mid-1930s, Louis Bigelow, then owner of Guana Island, had extirpated goats and had banned woodcutting for making charcoal. This had left only a couple of domesticated burros and free-ranging sheep on the island. The latter are far less destructive than goats.



A Guana Island view to the north showcases its rich flora.

In 1974, Henry and Gloria Jarecki purchased Guana Island. Access to this small island (300 ha) is limited, although it lies only a few kilometers from Tortola. The exclusive Guana Island Club had been constructed in a location designed to



Guana Island's lush habitat clearly demonstrates the positive results of controlling feral animals.



minimize impact on the natural habitat, attributable to the foresight of Louis Bigelow, who chose the construction site of the main clubhouse in the 1930s. Hiking trails around the island also were conceived to protect and minimize destruction of the lush vegetation.

In 1980, Lazell initially approached Mary Randall, then Guana Island Club Manager, to determine if the owners would allow relocation of Stout Iguanas. Randall was very enthusiastic about the concept, but two years would pass before Lazell would meet the owners and take the next step.

In the interim, he continued working on a plan that would establish a second population of Stout Iguanas while promoting other conservation and restoration goals in the British Virgin Islands. An idea for an exchange of species came with the realization that the vast salt ponds of Anegada, which had supported large colonies of Greater Flamingos (*Phoenicopterus ruber*) in the 19<sup>th</sup> century, could be restored if funds could be found. The beauty of this plan was the mutual benefits to all parties involved: the British Virgin Islands and the residents of Anegada would benefit from the reintroduction of flamingos and, at the same time, the second population would provide some assurance for the long-term survival of Stout Iguanas.

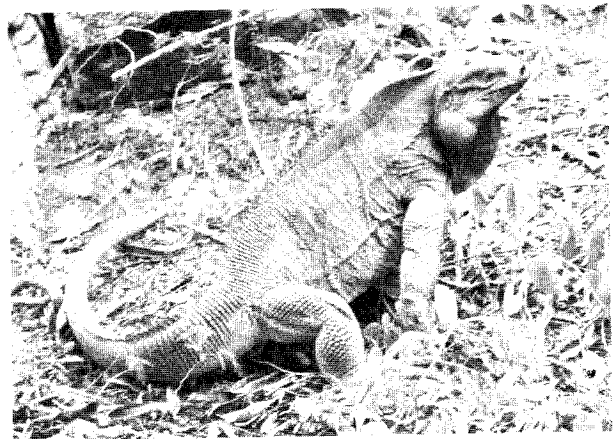


Practically any view from Guana Island is breathtaking.

Lazell first discussed the plan with several Anegada residents. One of them was the late Clement Faulkner, who maintained a Stout Iguana feeding station adjacent to his home in Bones Bight. The plan next was presented to Robert Creque (DNRE), Lazell's boss at that time. Everyone agreed that the idea made eminently good sense.

In March 1982, Lazell finally discussed the possibility of relocating iguanas with the Jareckis, who were initially apprehensive. Would Stout Iguanas damage the island they had worked so hard to protect? Would they bite staff or visitors or destroy ornamental plants on the hotel grounds? These questions would take some time to answer. However, that meeting was instrumental in developing the long-term relationship between the Jareckis and The Conservation Agency (Lazell) that continues today.

During the remainder of March and April 1982, Lazell surveyed the island with the help of Lianna, Divonne, and Tom Jarecki (nieces and son of Henry and Gloria) and the late author, Gerald Durrell, who happened to be vacationing there.



"Hambone," one of the founding iguanas on Guana Island, frequents the vicinity of the Club. Photograph by Numi Mitchell.

Lazell visited Guana regularly over the next several years, conducting fieldwork with the aid of the managers, Mary Randall and her successor John Damron. Lazell also continued to build a portfolio of published papers and testimonials noting the disastrous effects of feral competitors and predators on Stout Iguanas and their habitat. Major contributors were the late Dr. William MacLean (University of the Virgin Islands), Walter Phillips of Water Island, USVI, Dr. Robert Chipley, and Nick Clarke, former Director of the National Parks Trust, BVI.

In 1984, the Jareckis agreed to rid their island of sheep, provide a sanctuary for Stout Iguanas, and fund the relocation of flamingos. Their decision certainly was influenced by Lazell's efforts, but they also were drawn into wildlife conservation

through the interest their sons and nieces had shown. Today, Eugene Jarecki remains interested in conservation, Tom Jarecki works for the Environmental Defense Fund, and Lianna Jarecki is teaching biology at H.L. Stouff Community College on Tortola, BVI and is finishing her Ph.D. with a thesis on salt pond ecology.

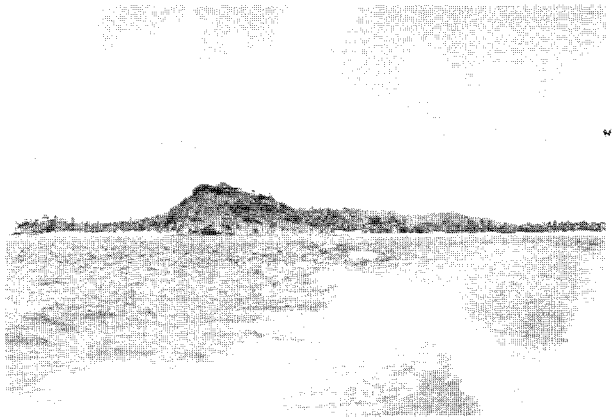
In July 1984, Lazell and four colleagues set off to Anegada in search of the first Stout Iguana destined for relocation to Guana Island. Lazell eventually captured a large, healthy, gravid female (SVL 46 cm) that was taken to Guana, where she was released on 29 July 1984. The other seven iguanas that comprised the founding stock (sex, SVL, and release date) were: male (41 cm; 19 July 1985), female (44 cm; 19 July 1986), female (22.4 cm, 27 July 1986), two females (33.5 and 43 cm, latter gravid) and two males (50.4 and 50.9 cm; 31 July 1986). Guana now had the foundation for a second population, but years would pass before the success of the relocation could be evaluated.

Lazell next set out to complete the species exchange plan. The Bermuda Aquarium, Museum, and Zoo (BAMZ) had both captive-bred and wild-stock flamingos and agreed to donate a number sufficient for establishing a population. Numi Mitchell (TCA) arranged the international transfer of the birds (BVI Agriculture and Fisheries Permit and veterinary certification of the birds' health, especially Newcastle's Disease). Numi and Glenn Mitchell (TCA) and James Conyers (BAMZ) transported the birds by jet from Bermuda to Tortola and then by boat to Anegada. The flamingos initially were released into a net holding pen at the salt ponds, allowing them to recuperate and

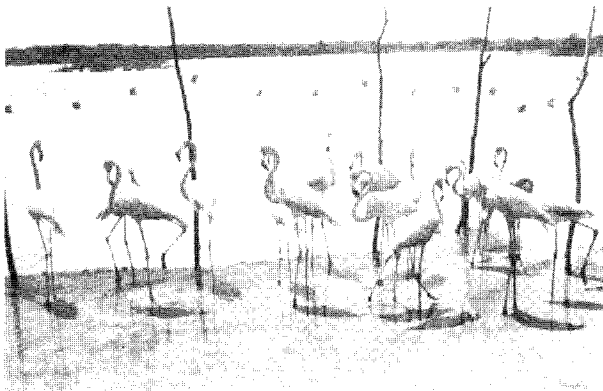
adjust to their new environment. On 7 March 1992, in a ceremony at the north end of the salt ponds, the Governor, the National Parks Trust, and the Anegada community celebrated the arrival of the first 18 birds. By 2002, the flock had multiplied to approximately 80 resident birds (Guana also supports six pinioned flamingos in a small salt pond, but they do not reproduce because the population density is too low).

### Necker

Necker Island, like Guana, is privately owned and exclusive, with a single luxurious resort, the Balinese Great House, situated on the highest point and overlooking the coral reef-studded waters of the Caribbean. The island supports dense tropical vegetation, composed of both native and non-native plants and enhanced by irrigation. The other half of the island is more typical of the region, with rocky terrain and small clusters of hardy trees, low shrubs, and dense stands of cacti. Designated a bird sanctuary, Necker is home to pelicans, doves, and hummingbirds.



Necker Island, BVI. high atop the island is the Balinese Great House.



Greater Flamingos (*Phoenicopterus ruber*) in holding pens shortly after their arrival on Anegada. Photograph by Numi Mitchell.

In 1994, Richard Branson, owner of Necker Island (30 ha), expressed an interest in establishing a third population of Stout Iguanas. Because the iguanas on Guana had enhanced the natural setting of the island and were well received by visitors, Branson was eager to expand the conservation effort. Lazell had worked previously on Necker and knew the island to be free of feral livestock and rats.

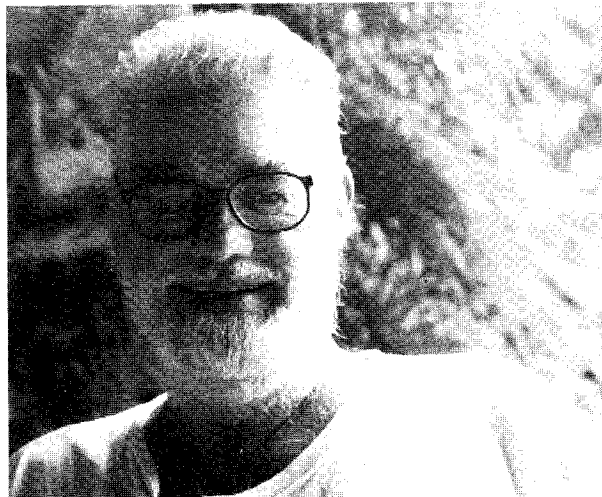
In October 1995, four hatchlings were taken to Necker and head-started for a year before being released. During that time, one female escaped, but was seen later and appeared to be gravid. In 2000, Lazell reported seeing the first hatchling and subsequent reports from the island indicated that Stout Iguana hatchlings were abundant. Although the population is still in its infancy, during the October 2002 population on Necker, founding stock, young adults, and hatchlings were recorded.



A Stout Iguana hatchling on Necker Island basking on the light sand walkway that leads to the beach. Small tail drags were numerous along these walkways.

### Today

Long after these second and third populations were established, their existence is not commonly acknowledged, little pertinent information is available, and some controversy remains regarding the



Dr. James Lazell on Guana Island, 2002.

circumstances under which they were established. In 2002, I was invited to participate in an assessment of the Guana and Necker populations. That survey, directed by Lazell and Mitchell, was conducted during "Scientists Month" from 4–29 October (each year, Guana hosts a large contingent of scientists who conduct research on the island).

After 14 hours of travel and delays, Guana was a little piece of paradise. At the dock, my gear was loaded into the Club's pickup and we proceeded up the steep, twisting road to the clubhouse. The Club overlooks the dense tropical vegetation of the island's southern end, the salt pond — home to the six flamingos, and the white beach of a little cove that merges imperceptibly with the crystalline waters of the Caribbean.



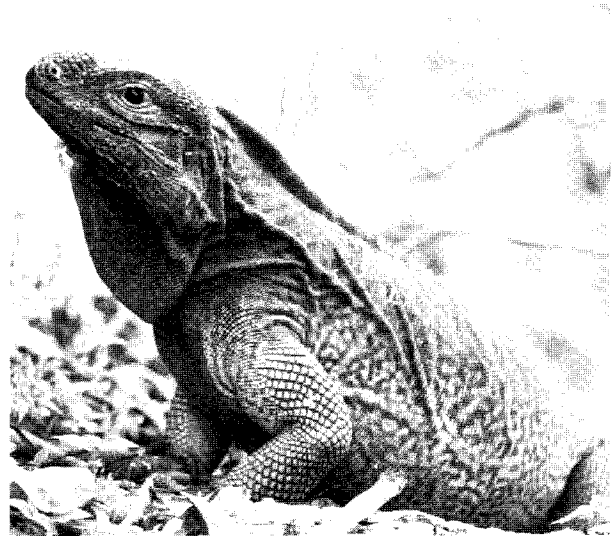
A southerly view of Guana Island from the Club. The salt pond with the six flamingos is located in the lower left and the beach and docking area in the center.

When I arrived at the patio, which overlooks the equally picturesque northern end of the island, it was alive with more scientific dialog than I could begin to imagine — scientists, some 20 of them, at lunch. After brief introductions, focus quickly returned to the population survey that was already in progress.

That same afternoon, we were issued several 2-oz syringe barrels loaded with white latex paint and began a survey of the Club's wooded perimeter and nearby support structures. Many Stout Iguanas, including the founders, live in close proximity to the Club. The weather was cloudy and damp from the morning's rain, which kept iguanas from venturing far to bask or forage.

The first sighting was somewhat unusual. We came upon four workmen digging a ditch next to a small structure while talking loudly to be heard over the radio playing in the background. Above them on a rock ledge, a large iguana lay casually, as if supervising their work. We marked the animal with paint, which did not appear to disturb it, and it remained nearby, seemingly unaffected by the intrusion. The remainder of the day included marking or sightings of younger adults and juveniles, but the weather was clearly hampering our efforts. The founding iguanas and other older adults were nowhere to be found.

The next day, Mitchell and I explored the area west of the main facility, accessed from the "Iguana Trail," while another team surveyed the southern area. The weather had improved, but remained partly cloudy and cool compared to typ-



This subadult Stout Iguana was foraging casually along the hillside near the Iguana Trail and allowed us to approach within 3 m. This animal was marked after the photograph was taken.



A hatchling Stout Iguana on Guana Island seeks refuge among the branches of a bush, reducing the likelihood of falling prey to a Racer, but increasing the chances of being spotted by a Kestrel.



Iguana Trail: a path originating at the lower Guana Club level and leading leisurely to the salt pond and beach below.

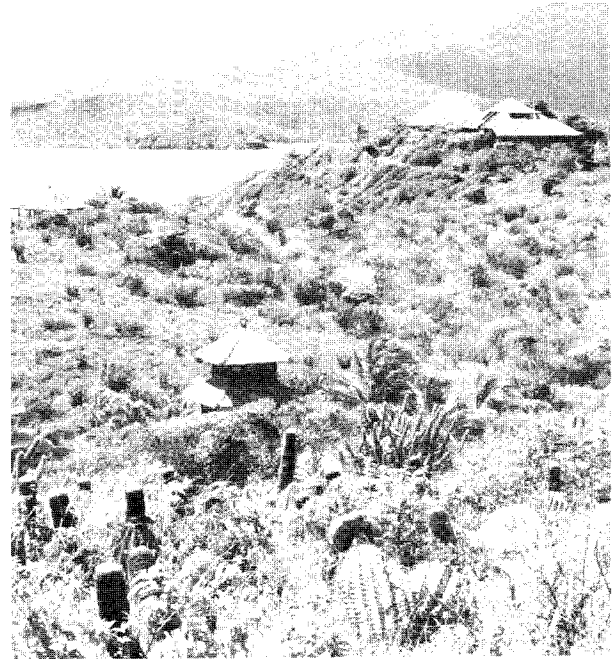


Guana Island's North Trail was created to minimize impact on the habitat, yet it provides hikers with fabulous views of the surrounding natural features. About 300 m beyond this point, an adult Stout Iguana was sighted thundering off into a cactus thicket.



ical conditions. Our first marking was a subadult on a steep wooded slope not 50 m from the trail's entry point. Like our first iguana on the previous afternoon, it was rather nonchalant about our presence.

That afternoon, we focused our attention on the northern section of the island where iguanas were not known to occur. Tail-drags are common on trails in the area south of North Beach, but they abruptly disappear to the north of a line roughly parallel with Crab Cove. The trail eventually splits into two routes, and Mitchell and I separated to cover more ground. About halfway between Crab Cove and Chicken Rock Steps, I observed one large, unmarked adult, who, unlike others we had observed, responded to the intrusion by quickly thundering off into a cactus



A southwesterly view of Necker Island showing the Balinese Great House (upper right) and the retreat quarters in the pagoda styled structure (foreground). Stout Iguanas were sighted within this area.



A southerly view from the north side of Necker Island reveals habitat more typical of the region, with rocky terrain and small clusters of hardy trees, low shrubs, and dense stands of cacti.

thicket. We saw no other iguanas or tail-drags, but did see some scat.

The survey continued and the weather improved each day, as did the frequency of iguana sightings. In addition to the population size estimate (see "Assessment" on p. 49), we recorded three incidents of predation on juvenile Stout Iguanas, two by Racers (*Alsophis portoricensis*) and the other by a female Kestrel (*Falco sparverius*).

Early on the morning of 14 October, ten of us left Guana by boat for Necker Island to assess the third population of Stout Iguanas, only seven years after the initial four hatchlings were released. The survey was limited to two days, and the team members quickly dispersed upon arrival.

Mitchell and I began our survey at a location near the main facilities where iguanas are fed twice a day. The ground and trails showed many signs of tail-drags clearly produced by individuals of vastly different sizes. We saw several iguanas in the thick shrubs around this area. From there, I worked the very dry northern section of the island and saw

only one drag and one seat. Mitchell sighted a few animals as she worked an area near where the iguanas are fed.

Others on the survey team successfully marked several individuals and recorded sightings of hatchlings along the pathways around the maintenance and support facilities. Two Racers also were observed in the same area.



Racers on Necker Island commonly feed on juvenile Stout Iguanas.

The next day, starting where the iguanas are offered food, we saw two of the founding iguanas. A conservative estimate placed these animals at about 47 cm SVL and well over 5 kg. Both appeared in excellent health, alert, and with coloration of rich brown above blending into turquoise flanks. We spent our remaining time around the nursery and beach facilities and saw several iguanas, including a subadult and hatchlings. As on Guana, the Necker iguanas appeared to concentrate near the developed areas.

In stark contrast to the boisterous excitement that characterized the boat ride to Necker, we quietly sought a comfortable spot for the return trip. Although tired from the day's hard work in blaz-



One of the four founding Stout Iguanas on Necker Island (shown near the feeding area) was hiding behind a clump of debris, straining to see if his morning serving had arrived.

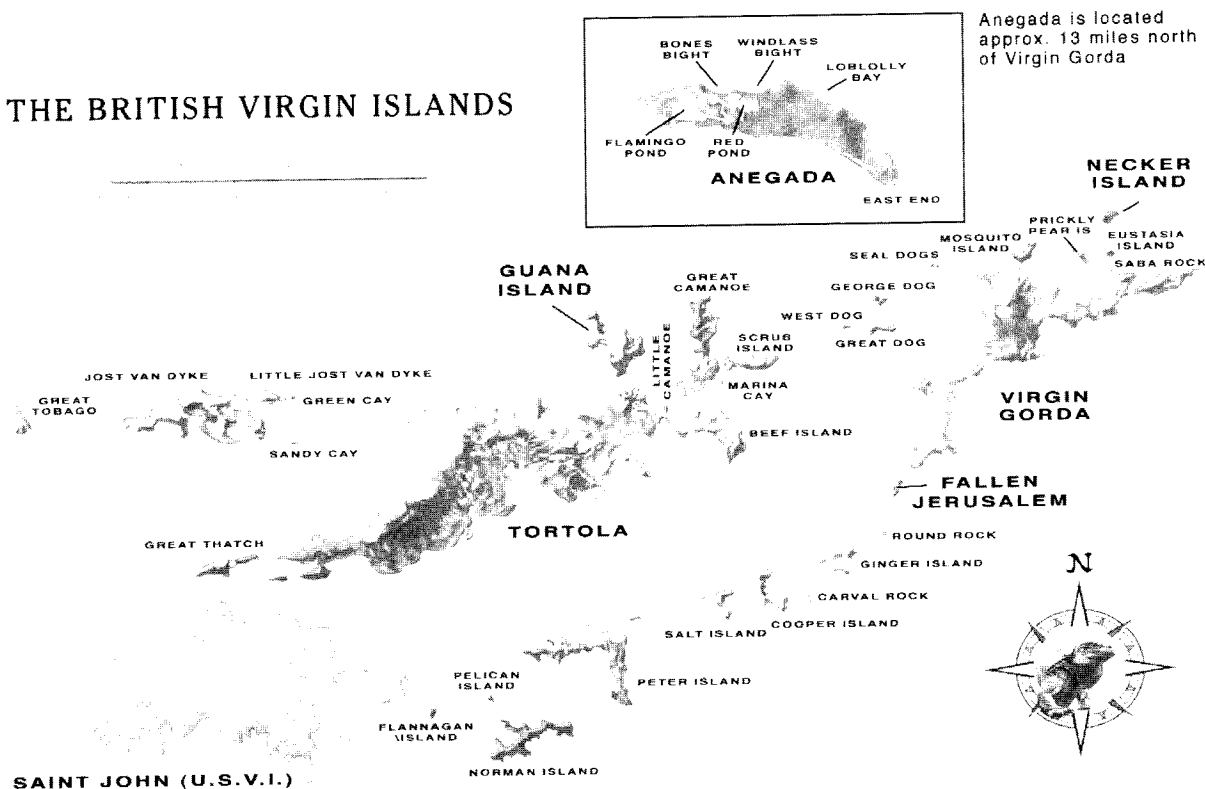
ing sun, we had time to reflect on events that had led us to this point in time and space.

The absence of committed, long-term funding continues to impede efforts to secure the species' survival on Anegada. Compounding loss of habitat is ongoing development. Consequently, Stout Iguanas are fighting for survival, suffering simultaneously from habitat degradation and predation on juveniles. Some fear that the upcoming assessment will determine that the Anegada population has declined to critically low numbers and may be functionally extinct in the wild. However, I believe, we all shared a warm feeling knowing that the outlook for Stout Iguanas had improved considerably through the efforts of a few very special people.



This lightly wooded area near a salt pond on Anegada shows vegetation heavily damaged by feral animals seeking shelter from the sun or areas to rest. Habitat such as this has no chance of recovery while feral animals are allowed to roam free.

## THE BRITISH VIRGIN ISLANDS



Anegada is located approx. 13 miles north of Virgin Gorda

### Acknowledgements

I thank James Lazell and Numi Mitchell for the invitation to participate in the Guana and Necker island population assessments, and Henry and Gloria Jarecki and Richard Branson for their hospitality and enduring commitment to ensuring the survival of Stout Iguanas. Allison Alberts, Rick Hudson, and Glenn Gerber have been instrumental in all my conservation efforts, and my wife Sandy has her sleeves rolled up right beside me. This article has benefited from comments by Gad Perry and Robert Powell.

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