

Sun, Students, and Scratches: Research on Allen's Cays Iguanas

Samantha C. Larimer^{1,2} and Stesha A. Pasachnik¹

¹Department of Biology, Earlham College, Richmond, Indiana 47374

²Current address: Department of Psychology, Cornell University, Ithaca, New York 14850

0730 h, temp 72°F, wind NE at 15 knots,
seas 2–3 feet

A group of Earlham College students yawn, rub their eyes, and awaken to the aroma of breakfast aboard the *Bahamas Star*. The boat has completed the five-hour journey to a set of remote islands located in the northern portion of the Exuma Island chain of the Bahamas. Here students will learn the essentials of herpetological fieldwork while working with the endemic iguanas.

Characteristic of lizards in general, the iguanas do not start their day until the sun's rays warm the sand on this group of three islands, known as the Allen's Cays. Consequently, the students' day will follow the same pattern, initially by waiting for the first iguana to make its way onto the beach to

bask. A leisurely breakfast is followed by the application of sunscreen and the packing of personal gear: sunglasses, more sunscreen, a towel, durable shoes, snorkeling equipment, Joy dishsoap (for an ocean-friendly scrub), Neosporin for scratches (on people and iguanas), photocopied maps of the island, and a Sharpie. Also loaded into the transport dinghy are rulers, scales, PIT-tagging equipment, large scissors, nooses, nets, pillowcases, and bait. These are the tools that the crew, headed by Dr. John. B. Iverson, will use to capture and examine *Cyclura cyclura inornata*.

Dr. Iverson began this study in 1980, a year in which some of the students who are currently participating in the adventure were not yet alive, and the rest were too young to have relevant recollec-



Figure 1. *Cyclura cyclura inornata* on the beach at Allen's Cays (photographs by Lynne Pieper, May 2001).



Figure 2. John Iverson measures an iguana; size is just one bit of data he and the students gather for each individual (photograph by Lynne Pieper, May 2001).

tions. In this ongoing natural history study of the endangered iguanas (C.I.T.E.S, Appendix 2), Earlham College students annually get an opportunity to be a part of this important research endeavor, learning about the iguanas whose story they're helping to document. Issues regarding this species' habitat, learning about other native species, the "challenge" of living on a boat in the Caribbean, and tourism are all parts of this expedition to the Exumas.

Cyclura cyclura inornata is a large iguana, reaching more than 120 cm in total length and often living for more than 30 years. Breeding populations, until recently, have occurred only on Allen's Cays. Here, they are found predominantly on Leaf Cay (4 ha) and U Cay (3 ha), although 11 individuals have been recorded from Allen's Cay (7 ha) (Iverson, 2000). The latter are all at least 10 cm larger than the largest individuals on the other islands. This is not only an amazing sight to behold but also a phenomenon yet to be

explained, although one may speculate that a difference in diet and/or reduced intraspecific competition might play a role. Between 1988 and 1990, eight individuals were transferred to Alligator Cay (1.8 ha), located in the Exuma Cays Land and Sea Park, Bahamas. This was done as a safeguard against the Allen's Cays population being destroyed by a stochastic event such as a hurricane, an epidemic, or the introduction of a feral mammalian predator. Since their introduction, these individuals have been very prolific and were, at last count in 1998, close to carrying capacity (Knapp, 2001).

For 21 years, Dr. Iverson has been taking groups of students to the Exumas from the small liberal arts college in Richmond, Indiana, where he teaches biology. Collectively, these expeditions have been able to gather data essential to understanding the life history and survival of this species. Eventually he would like to be able to document life expectancies, age classification, mating schedules, reproductive parameters, causes of death, and the means of their prevention. Basically, he wants to know just about everything one can learn with a minimum amount of intrusion. As part of this long-term data-collection project, temperature recorders (tidbits) are placed on the island in various habitats to monitor year-round environmental conditions. Dr. Iverson recently (June 2001) launched a more intensive study of the iguanas' reproductive behavior and capacity by spending the month-long mating season on the islands.

0830 h, and temps have risen

Iguanas become visible as dark masses peppering the sandy shore. The crew is ready for the day, and 11 former or current students and Dr. Iverson head to land to begin their work. Some members wait for a ride in the dinghy; others, eager to begin, load their bags into the boat and plunge into the water to swim the 150 meters to shore. Fifteen minutes later, catching begins in earnest. Students work quickly, walking the beach singly or in pairs, and looking especially at sites where iguanas aggregate while waiting for tourist handouts. Many of these iguanas have become accustomed to the tourists who travel in boatloads to see them, leaving their vessels for 10 minutes in order to throw some food scraps to these fascinating creatures before taking off for another island.

This feeding obviously is not a natural event, and its effects are something that Dr. Iverson hopes to someday understand. The massing behavior triggered by these handouts appears to have eliminated much of the territorial behavior that probably characterized the iguanas' ancestors. Also, the food, though easy to obtain, is not kind to these animals' digestive systems, often passing through their guts less completely digested than their normal diet of leaves and fruit (J.B. Iverson, unpubl. data). Whether this altered diet has an effect on the life span of this species is something that recently collected data comparing iguanas from different sites will hopefully be able to determine. Because limited areas of each island receive visits from tourists, detailed locality data will allow comparisons of growth rates between individuals receiving altered diets and those that are not affected by tourism.

In the short term, tourists are both helpful and a hindrance to the researchers. The familiarity of the iguanas with humans makes them initially easy to capture. Many can be approached easily, and the friendliest individuals can be captured with a sweep of the net. Others are a bit more cautious, and need to be lured with bait. Small rocks or shells found on the beach are sometimes enough, the falling objects possibly mimicking ripe fruit falling from a tree. For the most wary individuals, leftover food from the boat works well. Orange peels with their strong citrus smell and bright orange coloration are favorites; however, grapes, apples, bread, and lettuce all work well. More renewable than the food are "swing baits," which were invented by Dr. Iverson and his crew a decade ago. Large red Legos® tied to string can be tossed repeatedly to fall with just the right force to interest an iguana, and the red color is also thought to



Figure 3. Too heavy for the scales, handling this huge iguana, caught after hours of stalking by boat Captain Bruce on Allen's Cay, required two people, in this case John Iverson and Geoff Smith. For unknown reasons, iguanas on Allen's Cay tend to grow much larger than those on Leaf or U Cays (photograph by Lynne Pieper, May 2001).



Figure 4. Students Colin Meeks and Stephen Jones “touch, catch, chase, and harass” a young iguana, ignoring the sign in the background that prohibits such activities — but it’s all in the name of science (photograph by John Iverson, March 2000).

excite them. An added advantage of the swing baits is that they can be pulled in slowly, luring reluctant individuals from the bushes to a net lying on the ground, which is flipped over the distracted lizard. The struggling iguana is then extracted from the net. This is often a two-person task, especially for larger individuals, and painful scratches have been known to result from the effort. Eventually, the lizard is placed into a pillowcase, which is tied and placed in the shade until processing. Variations on the catching theme are numerous, with each student developing his or her own technique over the course of the week. Large nooses of heavy cord attached via fishing swivels to extendible golf ball retrieving rods are sometimes more successful on particularly cautious animals. Their curiosity at the swinging cord often causes them to sit patiently while the noose is adjusted. Occasionally the animals will virtually noose themselves as they attempt to bite the cord.

Regardless of capture technique, the bagged *Cyclura* are taken to a workstation where they are processed. Each lizard is weighed, sexed, measured (both tail and snout-vent lengths are recorded), marked, and released. Marking is done in a variety of ways. All captured iguanas are toe-clipped and

many, depending on size, are PIT-tagged. Passive Integral Transponders are tiny glass beads with wire coils inside. They are injected subcutaneously, allowing the animal to be identified with the sweeping of a reader which shows an identification code, much like the system used by supermarkets to ring-up prices on groceries. Together, these two methods of marking provide very reliable identification (Iverson, 2000), even allowing dead and decaying animals to be recognized. Prior to release, the iguanas are marked temporarily with non-toxic paint. This identifies them as previous captures and eliminates wasted time chasing animals for which data have already been recorded.

The response of tourists to this fieldwork varies from wanting to be a part of the effort to extreme anger. A few folks become quite offended by the marking of individuals, possibly because it destroys otherwise perfectly natural looking pictures. However, because they too want to help preserve these magnificent animals, others comment on the researchers’ intrusive methods, and cite signs on the islands that threaten dire consequences to those who interfere with these vulnerable creatures. Dr. Iverson, in fact, was instrumental in putting up the very signs that the tourists quote,



Figure 5. After more than an hour of trying to coax this iguana out of the brush using every type of bait available, student Chaundra Schofield was on the verge of giving up when the previously reluctant beast came running down to eat a grape out of the hand of a newly arrived Italian tourist. A quick sweep of the net and two people to help detangle it, and the year's largest iguana from Leaf Cay was in hand (photograph by Samantha Larimer, May 2001).

and the research he is undertaking has been approved by all of the appropriate permit-granting agencies. Still, we were pleased that tourists acknowledge the protection afforded these animals and are willing to take action.

Although many people encountered in the field are doing what they can to help protect these animals, many others are still causing harm, sometimes unknowingly. Humans are the only significant threat to this species, whether it is in the form of feeding by tourists, poaching, or illegal exploitation for international trade. Each action has its own serious effects. This species is protected under national Bahamian Law, but enforcement is lacking because no warden works in the area and these islands are extremely secluded (Iverson, 1999). As



Figure 6. Students James Rose and Brendan Gallagher mark an iguana with car touch-up paint to avoid recapturing the same individual later that trip. The paint is eventually shed with the skin and causes no permanent damage (photograph by Lynne Pieper, May 2001).

for the future, conservation plans include additional studies of the introduced individuals on Alligator Cay and possible captive-breeding programs at the Ardastra Zoo in Nassau and the Nature Centre Different on Abaco (Iverson, 1999). These are hopeful prospects, but actions taken by individuals are even more important for the preservation of this species. Taking time to report illegal treatment of this species and educating oneself and others are methods by which everyone can help save the endangered Allen's Cays Rock Iguanas.

1800 h, temperatures are dropping

The crew piles into the dinghy to return to the boat for dinner. Many have spent the entire day on the island and this will be the first time since breakfast that they will be back onboard. After dinner,



Figure 7. An iguana, excited by a rock that fell onto the sand, comes running to investigate, only to fall prey to a net lying on the ground near the well-placed stone (photograph by Samantha Larimer, May 2001).

students gather on deck to listen to Captain Ron, John, and alumni tell stories of past trips, laughing and gasping appropriately. Although most students participate in only one week of this long-term study, these stories allow them to grasp all that goes on in a research project of this intensity and duration. This undoubtedly is a new concept for some, as each party is composed of a wide age-range of individuals with varied interests and backgrounds in science. For some, this will be their only exposure to science-in-action (as opposed to merely learning about it from books or television).

Besides the interesting stories, students lounging on deck also entertain themselves with good books, decks of cards, or by recording the day's experiences in their personal journals, jotting down recollections and impressions of the day's exciting events. The iguana-catching process itself is thrilling. It gives students an opportunity to relive

their childhood fantasies of exploration and adventure, their survival dependent upon outsmarting the wild animals they stalk. However, students do more than work, taking occasional short breaks to explore tide pools, go snorkeling, or try their luck at retrieving coconuts from trees. Finally, with heads filled with images of the day's experiences and eagerly anticipating tomorrow, the students make their way to the bunks to rest in preparation for the next day's exhilarating activities, dreaming about that one iguana that just couldn't be caught, new capture techniques, a section of the island yet to be explored, whether or not enough iguanas can be captured to shatter last year's record, ...

Note: Stesha Pasachnik and Samantha Larimer were participants on trips in March 2000 and May 2001, respectively. They thank Bob Powell and John Iverson for comments on this paper, and the latter for making such trips available to students.



References

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