

THE TROUBLE WITH 'LEWISI

BY R. EHRIG

The Grand Cayman Blue Iguana, *Cyclura nubila lewisi*, is one of the rarest and most beautiful lizards in the world. It is native only to the island of Grand Cayman, Cayman Islands. Already very rare when first described in 1940 (Grant 1940), the Blue Iguana has continued its decline ever since. *Cyclura nubila lewisi* is under intense pressure by man through the severe alteration of habitat and continued presence of introduced feral predators.

C.n. lewisi is a large species of *Cyclura*. It is known to reach a total length of 5.5 ft.(1.66m) (Noegel 1990). Males are larger than females and have a larger head and taller crest. Schwartz and Carey (1977) reported their largest male SVL at 515mm and largest female SVL at 410mm. Adults are dorsally bluish gray to bright blue anteriorly, ranging to blackish posteriorly. The head is bright blue or powder blue. This is the most distinctive feature of this iguana. The Grand Cayman Blue Iguana becomes a more intense blue as it matures.

The total current wild population is estimated at 25-50 individuals restricted to the East End District. This is the eastern half of the island of Grand Cayman. It is also the least settled. *C.n. lewisi* is known to occur at two sites; (1) the seaside of the Queens Highway, near the northeast corner of the island, and (2) adjacent to an active rock quarry near the center of the East End District. A 4-5 year old iguana was road killed on the Queens Highway in the fall of 1991 (see Iguana Times, Vol. 1, No. 3). Several others are known to have been killed there in the last decade (Montanucci pers. com.) This area has some of the best iguana habitat left on the island but also some of the most dangerous due to the highway.

Some reproduction is still occurring in the wild, as evidenced by sightings of subadult and even hatchling iguanas. The Cayman Turtle Farm has a young iguana caught in East End in 1989 which was probably born in the wild in 1988.

Until the early 1980s, the East End was a somewhat isolated place. The construction of the Queen's Highway changed that forever and opened

up many areas to development. Several secondary roads were constructed into some of the last iguana habitat. This resulted in increased sightings and more captives. Many large areas were cleared of native vegetation for agriculture and rock mining operations.

In addition to intense development pressure, feral cats and dogs pose a great threat to the remaining wild population of *C.n. lewisi* (Montanucci 1990 pers. com.). Caymanian farmers have been known to trap and kill iguanas. In recent years traps have been found (Avery 1987), some with iguana remains inside them (Burton 1991 pers. com.). In March 1991, I was told by a Caymanian that, "he could get an iguana whenever he wanted."

In 1990, the Lizard Advisory Group (LAG) of the American Association of Zoological Parks and Aquariums (AAZPA) designated *C.n. lewisi* as a species of high priority for conservation and captive management. A number of American zoos agreed to devote considerable space and resources for captive breeding of this rare iguana. The National Trust for the Cayman Islands embarked on a captive breeding program with a substantial budget for a public information campaign and construction of captive enclosures. It appeared that the Cayman Blue Iguana was on the road back from extinction, but this is when things started to get complicated.

In August, 1990, Edward Louis and Denise Garcia, graduate students under the supervision of Dr. Scott K. Davis (Texas A&M University) went to Florida to collect blood samples for a genetic study. DNA was isolated from the blood samples, and restriction endonuclease analysis of the mitochondrial DNA (mtDNA) revealed genetic markers which differentiate the three subspecies of *Cyclura nubila*. Preliminary results confirmed what had long been suspected by several parties, that some of the captive population were hybrids between the two Caymanian subspecies. In early 1992 additional blood samples were taken on Grand Cayman and on Little Cayman. The iguanas kept at the Trusts breeding facility, the Cayman


Turtle Farm, and several privately held animals were sampled. Six Little Cayman Rock Iguana, *Cyclura nubila caymanensis* kept at several locations on Grand Cayman were also sampled. On Little Cayman, three additional iguanas from the wild population were sampled. The recent samples have allowed a definitive assessment of the genetic background of all iguanas tested. The results indicated that the majority of iguanas in captivity in the United States are hybrids between the two subspecies. All of the pure *C.n. lewisi* are the offspring of one female.

On Grand Cayman, all the wild caught iguanas are pure *C.n. lewisi*. The original pair sent to the Cayman Trust from Florida in 1990, and all the 1990 and 1991 hatchlings are hybrids. Three subadults sent to the Cayman National Trust from Florida in 1991 are also *C.n. lewisi*. The Trust also owns two wild caught pairs, so despite all the initial setbacks there exists a large potential gene pool in captivity on Grand Cayman.

The problems for future captive breeding of *C.n. lewisi* in the U.S.A. are substantial. Before any serious breeding is attempted, many of the iguanas in captivity will need to have their genetic status verified. The vast majority of animals in U.S. zoological collections that have been blood typed have been identified as hybrids. A small number of animals in zoos have yet to be tested. An unknown number of animals are in private hands and few of these iguanas have had blood analysis. Cooperation between a number of individuals will be instrumental in identifying the true *C.n. lewisi*. It seems certain that 75% or more of the animals in the U.S. will be identified as hybrids when the blood analysis is completed.

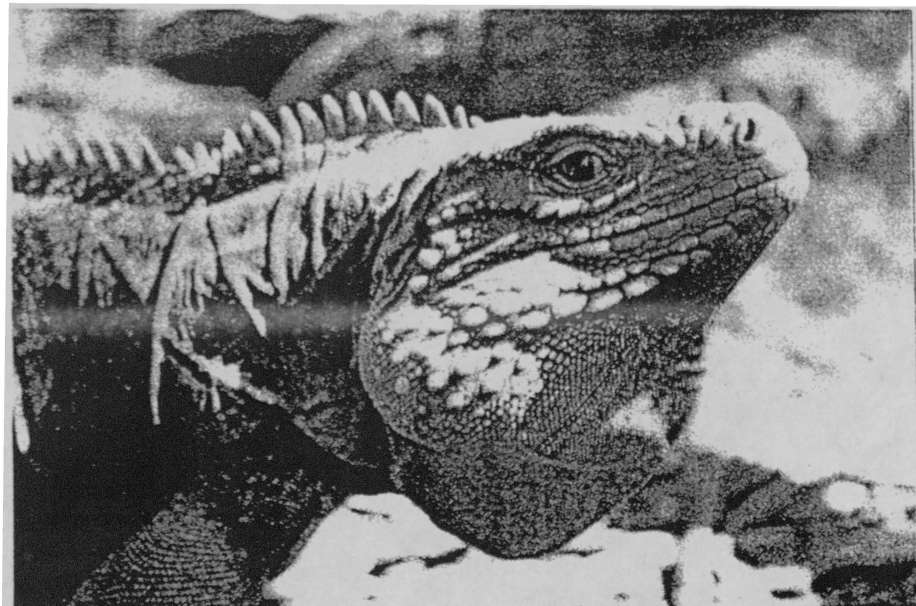
All early breeding in Florida (early to mid 1980's) was done with genetically contaminated animals. The hybrid female among the founder stock of *C.n. lewisi* has been more prolific than the pure female. The hybrid female produced earlier and laid larger clutches. Her offspring have also reproduced in recent years and have complicated the problem.

The pure female has produced offspring with 2-4 wild caught males. Is this sufficient genetic diversity for a captive population? Many questions need to be addressed before a captive population can be effectively managed.

Future articles will address morphological differences between hybrids and purebreds. 

Literature Cited

- Avery, R.A. 1987. The Present Status of the Land Iguana *Cyclura nubila* in the Cayman Islands. Report to the Portfolio of Development and Nat. Res. 7pp.
- Burton, F. 1991. Personal communication. Mosquito Research and Control Unit, Box 486, Grand Cayman, BWI.
- Grant, C. 1940. The herpetology of the Cayman Islands. Bull. Inst. Jamaica, Sci. ser. 2, 1-65.
- Montanucci, R.R. 1990. Personal communication. Clemson University. Clemson, South Carolina 29634.
- Noegel, R., and Moss, G. 1990. Grand Cayman Blue Iguana *Cyclura nubila lewisi*. Report, unpublished. 12pp.
- Schwartz, A., and Carey, M. 1977. Systematics and Evolution in the West Indian iguanid genus *Cyclura*. Stud. Fauna Curacao Caribb. Is. 173, 16-97.
- Schwartz, A., and Henderson, R.W. 1991. Amphibians and Reptiles of the West Indies: Descriptions, distributions, and natural history, p.396-398.



Cyclura nubila lewisi
x caymanensis.
Photography: R. Ehrig