GILBERTO SALAZAR

The Nature Reserve in the Motagua Valley is meant to protect a variety of endangered animal species as well as their endangered semi-dry tropical forest habitat.

CONSERVATION UPDATE

Project Heloderma and Project Palearis: Progress Toward an *In-Situ* Reproduction Center

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The Guatemalan Beaded Lizard (*Heloderma horridum charlesbogerti*) and the Guatemalan Black Iguana (*Ctenosaura palearis*) are endangered species endemic to the semi-dry forest remnants of Guatemala's Motagua Valley. Based on research undertaken by Daniel Ariano, a species recovery plan for the Beaded Lizard was created in December 2003. Known as Project Heloderma, the project is being implemented by Organización Zootropic, in collaboration with local and international partners, the International Reptile Conservation Foundation (IRCF) and ZooAtlanta. Project Palearis was created by those same partners in September 2006 to evaluate the conservation status of the Black Iguana and undertake any necessary protective measures.

STEPHANIE SCANLIN, ZOOATLANTA

DANIEL ARIANO

The Guatemalan Beaded Lizard (*Heloderma horridum charlesbogerti*; top) and the Guatemalan Black Iguana (*Ctenosaura palearis*; bottom) are endangered species endemic to the semi-dry forest remnants of Guatemala's Motagua Valley.

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DANIEL ARIANO

The location of the Motagua Valley in the rugged highlands of Guatemala.

For both Project Heloderma and Project Palearis, as with conservation efforts for any species or habitat, progress is ultimately dependent on the ability to gain and maintain local community support for the program. Of the many tools used to gain support, educational programs are one of the most powerful and effective. These programs serve to bring the vision and awareness of the conservation program goals directly to local inhabitants and community leaders. The aim of this particular educational program is to visit each of 20 village schools surrounding Beaded Lizard habitat in the Motagua Valley each month.

A grant from the Disney Worldwide Conservation Fund provided funding for educational programs during the 2007–8 and

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An overview of the Motagua Valley.

2008–9 school years. The program is based on ten different modules (full-day presentations for each module) and each school is exposed to all ten modules during a single year. The full program of modules teaches many aspects of regional conservation. These include: Beaded Lizard and Guatemalan Black Iguana conservation, general conservation of the region's flora and fauna, waste management, and water recycling. Each program or presentation is accompanied by live animals, interactive materials that illustrate the particular concept of the module being taught, and a questionnaire to evaluate the effectiveness and need for that module.

One of the main villages within critical Heloderma habitat is El Arenal. The villagers have been working with Zootropic since 2003, and now work with Projects Heloderma and Palearis. In December 2008, a small Christmas party was held by Project Heloderma for the villagers of El Arenal as a way of thanking them for all their help and assistance with our efforts.

Other vital aspects of the conservation program include research, the establishment of protected areas, and captive breeding. The research program covers studies performed with radiotelemetry to learn more about the ecology of the species, as well as analyses of major threats facing each of the species. To date, research has conclusively identified three primary threats to the remaining population of *H. h. charlesbogerti*. They are:

1. Agricultural development of remaining dry forest remnants and other practices and efforts that lead to development in pristine wildlife habitat: The remaining habitat of *H. h. charlesbogeti* within the Motagua Valley is fragmented, consisting of small patches of dry forest and a few significant areas of mixed (= patch) forest. The greatest loss of habitat is to subsistence crops, primarily maize, which is grown by small farmers who rent undeveloped patch forest from larger landowners. The effects of destroying critical remaining habitat are two-fold: The forests are cleared to grow maize, and the land is subsequently used to graze cattle.

2. Needless killing of *H. h. charlesbogerti* that is based on fear and superstition and/or ignorance attributable to inadequate awareness education: Historically, myths about *H. h. charlesbogerti* have been passed from generation to generation. These myths, along with the reputation of *Heloderma* for being extremely poisonous, are deeply rooted in local communities, and even in communities outside the animal's range. This results in animals being killed whenever they are encountered, undoubtedly contributing to the decline of the species at the same time as development proceeds in its range.

3. Illegal extraction and exploitation of wildlife from the Motagua Valley: Illegally collected lizards are sold to private collectors, zoological institutions, and taxidermists. The elevation of this species to CITES I does provide some international protection; however, illegal trafficking remains a significant problem. Ariano estimated that approximately 35 *H. h. charlesbogerti* were taken from their habitat and sold during the 1990s to foreign or local collectors. This estimate was determined by interviewing local people within the range of the species, and reviewing the complaint registry specific to illegal extraction.

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A grant from the Disney Worldwide Conservation Fund provided funding for educational programs during the 2007–8 and 2008–9 school years. The educator pictured here is Antonio Urbino.

GILBERTO SALAZAR

ANTONIO URBINO

Villagers in El Arenal (top) have been working with Zootropic since 2003. In December 2008, Project Heloderma held a small Christmas party for the villagers of El Arenal to thank them for their support.

Another component of the research program involves determining and characterizing actual and potential habitat of *C. palearis*. To this end, information was compiled for specimens preserved in national and international collections. These data were used to produce a map to show the actual and potential distribution of the species in the Motagua Valley. Our investigations also have revealed that poaching is a serious threat to the survival of the Guatemalan Black Iguana. Whereas the local people may occasionally take one or two animals for food, much larger numbers are collected and sold into the pet trade.

In 2007, to inaugurate the protected areas program, we were able to purchase 139 acres within the Motagua Valley thanks to the fund-raising efforts of Zootropic, the IRCF, and ZooAtlanta. The reserve facilitates conservation of vegetation and wildlife, helps conserve streams by protecting trees along the shores of rivers and small streams, and ensures the sustainable growth of wood and timber by preventing illegal logging. Most of all, it provides the Beaded Lizards, Black Iguanas, and other wildlife that inhabit the area an opportunity to exist, assuring them food and shelter. We hope this purchase is the first step toward repopulating surrounding areas with these amazing reptiles, which have been on the verge of extinction. Project Heloderma continues to assess other properties for possible acquisition.

A New Threat Arises

In late 2008, the reserve and its wildlife faced a significant new threat. An open-cast (strip) mining operation for copper, iron, lead, and manganese was proposed for the areas surrounding the reserve. In Guatemala, proposed mining operations require an Environmental Impact Study in which the applicant presents an analysis of potential environmental damage and proposes mitigation measures. This study was presented on 30 September 2008.

In the interim, Project Heloderma asked for a review of the project and presented what is known as Critical Opposition. We found substantial inaccuracies in the environmental impact study, which stated that: (1) The area surrounding the reserve for which the project was proposed lacked any type of forest cover and its main use was as grassland; and (2) The proposed mining would not

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Protected land in the Motagua Valley.

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Much of the terrain in the protected area is rugged, but portions with less relief had been vulnerable to clearing and development.

affect any animal species, particularly no endangered species, since none were present in the area.

Since Project Heloderma had been conducting research in forestry, biology, and ecology within the area, we were able to present scientific evidence of forest variation and species richness in the reserve and its surroundings. As part of the awareness programs in the area and as a means for letting the mining companies know that the area is critical for the conservation of various species, the perimeter of the reserve was clearly defined. The mere suggestion of mining triggered an escalation in land prices, which has prohibited Project Heloderma from continuing in its efforts to acquire conjoining and other property to expand the protected area.

In February 2009, we were pleased to hear that the mining company had announced that it would be leaving the area, negatively affecting only a small portion of the forest. However, some time will pass before real estate prices settle back to their original value. Project Heloderma will continually monitor real estate opportunities as prices fall.

Captive Breeding

Part of the original charters for both Project Heloderma and Project Palearis involved the development of a captive breeding and headstarting facility to help restore populations of Beaded Lizards and Black Iguanas. We are proud to announce that the first *in-situ* captive reproduction/headstart facility for both endangered species is slated to be in place by the end of 2009. Construction of the center is partly funded by the Tropical Forest Conservation Fund (FCA), which will act as manager of the funds generated by the program "Debt for Nature Swap" between the U.S. government and Guatemala. Other funds derived from international contributions through the efforts of the IRCF and ZooAtlanta will supplement the governmental efforts.

The Heloderma Breeding Center will be designed by Project Heloderma partners, which include civil engineers, forest engineers, and biologists. The center is part of the National Strategy for the Conservation of the Beaded Lizard, which includes reproduction *in-situ* and *ex-situ* as a vital component in the effort to conserve this species. The structure will be built on a quarter-acre site of degraded habitat that is part of the Projects' protected land located at the property's entry point. The cost of construction is estimated at US $25,000.

The center will provide Project Heloderma and Project Palearis with a physical location to implement the study of captive husbandry and reproduction. Current plans are to devote 80% of the breeding area to *Heloderma horridum charlesbogerti* and 20% to *Ctenosaura palearis*. Along with the reproductive facilities, the center will serve as the base for the reserve's permanent staff and as a reception area for eco-tourists and visiting scientists. In order to meet these needs, the center will have a guest room, two bedrooms, a laboratory, a reception area, a bathroom, and reproductive pens for Beaded Lizards and

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The Heloderma Breeding Center will be built on a quarter-acre site of degraded habitat that is part of the Projects' protected land located at the property's entry point.

BRAD LOCK, ZOOATLANTA

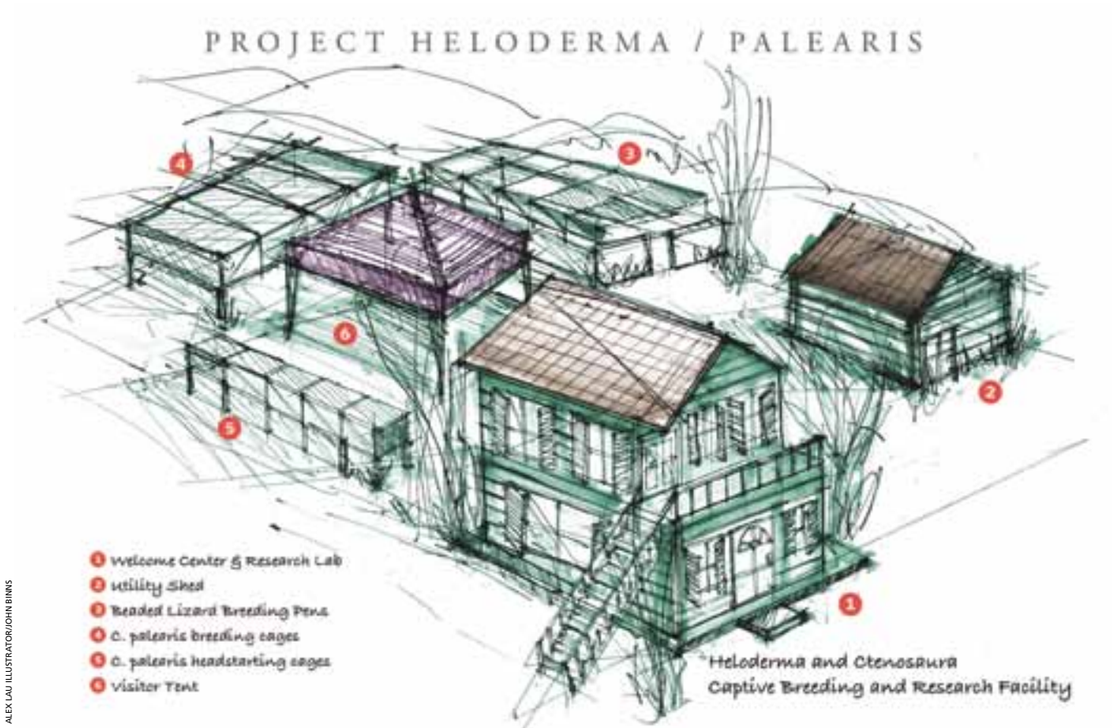
Breeding and husbandry lessons learned at ZooAtlanta will be implemented when the new facility becomes operational.

caged enclosures for Black Iguanas. However, the cost of breeding enclosures is not covered by current expense estimates. Each of the ten enclosures is expected to cost $600.

The 5 X 2-m wire mesh enclosures for *Heloderma* are to be constructed along a dry gulley alongside the station, an area that mimics the microhabitat used by Beaded Lizards during the breeding season. The pens will provide ample shelter, trees for climbing, and natural vegetation, such as *Hechtia guatemalensis* (a ground bromeliad). The tops of the pens will be open, allowing exposure to natural sunlight, as well as the prevailing photoperiod and temperatures. Each pen will be situated so that inhabitants will have no visual contact with their neighbors until the onset of the breeding season. We hope all of these factors will combine to promote breeding behavior.

Construction Options

The two options considered for the construction were mampostery (a type of stone and mortar construction adapted from Spanish building methods) and the use of lignified (compressed) wood. After reviewing bids from three different companies, we found the most attractive and cost-effective option was construction with lignified wood. The proposal by Casas Tipo Canadiense (www.casastipocanadienses.com) fits within the budget (US$21,098) and is a hybrid between two different designs, the Tipica 5B & Tipica 10. These designs include two rooms, a laboratory, one bathroom, and a reception area. A guest room and another bathroom will be added later. The price given by the company is for design, construction, and materials. However, electrical installation, interior walls, and other details are not included. This type of construction is in harmony with the landscape, and provides Projects Heloderma and Palearis with a top-of-the-line, modern center that imposes a minimal visual impact on the surroundings. The Breeding Center will be a world-class attraction, generating substantial scientific interest and a positive economic impact on the area.



ALEX LAU ILLUSTRATOR/JOHN BINNS

In addition to reproductive pens for Beaded Lizards and caged enclosures for Black Iguanas, the center will serve as the base for the reserve's permanent staff and as a reception area for eco-tourists and visiting scientists.