Value-added Conservation Science: Outreach Activities that Support Conservation of the Anegada Iguana

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Photographs by the authors unless otherwise indicated.

The recovery of the Anegada Iguana (*Cyclura pinguis*) depends on the diligent work of many natural resource managers and biologists as well as a commitment from the residents of Anegada. That the species' recovery program continues to include outreach activities aimed at increasing local knowledge of and support for conservation activities should not be surprising.

"Value-added" is an economic term that refers to increasing a product's value and thus the revenue from it. Outreach is a "value-added" activity because it increases the value of the research. Transmitting results of conservation and research programs to the public increases the conservation programs' "revenues" or effectiveness.

Designing and implementing outreach activities on Anegada is truly a unique experience. With a total of about 100 full-time residents on the island, one can accomplish activities that reach all or most residents.

The best method for determining the direction of an outreach program is to carry out a social survey to understand the outreach needs as they relate to conservation goals. We administered a general survey on Anegada in July 2003 and a second, specific survey targeting teachers in October 2004.

CLINTON "LEE" VANTERPOOL

Lee Pagni interviews a resident of Anegada for the 2003 social survey.

The first survey assessed local support for and understanding of various conservation activities relating to the Anegada Iguana. As would be expected, 94% of the respondents (N = 34) supported the headstarting program begun in 1997. Somewhat of a surprise, however, was the strong majority of respondents (89%) who supported cat eradication. With this and other data about local perceptions of the conservation program, we developed a plan for outreach. In the last two

ANEGADA WILDLIFE NEWS

Welcome to the first issue of Anegada Wildlife News!

Upcoming Events

CYCLURA CYCLE

SPECIAL ANNOUNCEMENT!

The first issue of the "Anegada Wildlife News" was distributed in Fall 2004. The newsletter serves the important purpose of keeping residents informed about the recovery process.

The only school on Anegada has approximately 40 students and seven teachers.

A ZooCorps member makes sure she has the genetic sequence correct for her necklace.

years, a variety of outreach activities that support Anegada Iguana conservation have been implemented on Anegada and in the United States. These activities not only add value to the research, but also are ultimately vital to garnering public support for the conservation and research programs.

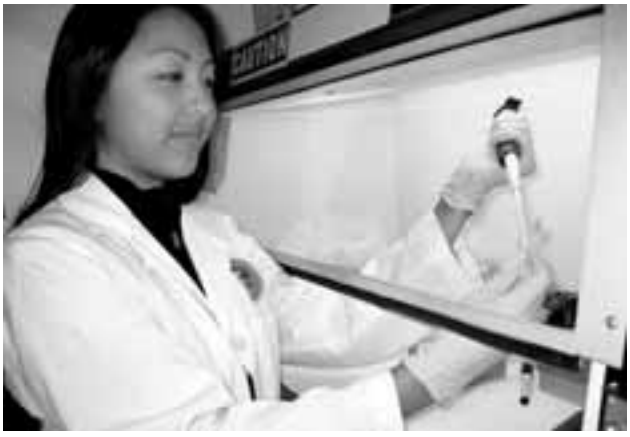
Acting Local

One of the most important lessons learned from the social survey was that Anegada residents held a good deal of misinformation about the iguana restoration program. To help counter this and to attempt to inform all residents about current iguana conservation activities, we created a newsletter. Data from the survey and other interviews told us what type of information residents were interested in knowing. In August 2004, the first edition of the "Anegada Wildlife News" was delivered to residents and schoolchildren throughout the island. The newsletter's fun design, wealth of images, and popular crossword puzzle made it a hit with locals.

The second survey, a teacher assessment given to all seven teachers at Anegada's only school, helped us develop a plan for engaging teachers and students in conservation education activities. The second-most requested outreach activity as determined by the survey was talks by scientists for the students. To meet this need, talks have been scheduled throughout the year. In February 2004, Kelly Bradley gave a presentation to the secondary students at the Anegada School, introducing them to radio-telemetry and its utility for understanding the habitat requirements of iguanas.

Results of the 2003 survey indicated that the headstart facility is a focal point for locals and tourists wanting to learn more about the Anegada Iguana. In order to engage this interested audience, we developed plans to create a series of interpretive materials that allow a self-guided experience at the facility. The first sign developed was the result of a genetic study (see below) and will be integrated into other self-guided materials that explain all the activities involved in the recovery of the species.

Making a full circle connection; ZooCorps members learned about Anegada Iguana genetic studies, then made necklaces for students on Anegada using a sequenced gene from iguanas.



Jennie Lau of the Zoological Society of San Diego's Conservation and Research for Endangered Species (CRES) Department prepares genetic samples as part of the Anegada Iguana genetic study.

J.J., a member of ZooCorps, works on the "genetic jewelry" that will be given to a student on Anegada.

ZooCorps members made this display and used it to help explain the Anegada Iguana's genetic status to guests.

Thinking Global

To add more value to conservation and research programs, we must remember that people living around the world are interested in programs that protect our collective natural heritage.

A grant from the Institute of Museum and Library Services helped the San Diego Zoo carry out a comprehensive genetic study on the Anegada Iguana. The study helped determine how close the relationships were among the six iguanas in the Zoo's collection and measured genetic diversity within the wild population. The grant also helped fund outreach activities that add value to this important research.

At the San Diego Zoo, a group of 13–16 year-old volunteers called ZooCorps taught guests about the role genetic research plays in the restoration of the Anegada Iguana. Volunteers were taught about microsatellites and how these non-coding genes are used to give an estimate of genetic diversity within the population. ZooCorps members then set up a booth in front of the Anegada Iguana exhibit for two weekend days and taught guests about what is being done to protect the species. To reinforce the concept of genetics, ZooCorps members led guests in making necklaces out of four differently colored beads representing the four genetic base pairs. At the end of this program, ZooCorps members made necklaces for the students on Anegada, including with the necklace a personal note to the Anegadian students.

From the genetic study, an educational activity was developed to help middle and secondary school students understand more about microsatellites and how they are used to determine the proximity of relationships. This study was a collaborative effort between geneticists and educational specialists at the San

One of the goals of outreach is to involve local residents in all parts of the research. Here Camilla Serieux, a resident of Anegada, helps release a headstarted iguana back to the wild.

Diego Zoo. The lesson introduces students to concepts of genetic conservation and involves three increasingly difficult activities. The final activity relates directly to the research project and has students determine the paternity of six iguanas, given one female and two possible sires, each with a contrived set of determined microsatellite alleles at two loci. To distribute the lesson as widely as possible, it resides on the San Diego Zoo's web site (www.sandiegozoo.org) and is indexed for internet search engines using keywords such as curriculum and microsatellite.

Several other outreach activities have been developed for this project. These include a graphic panel explaining the plight of the Anegada Iguana and how genetics are being used in conservation efforts. The sign will be placed in the Anegada exhibit at the Zoo. Dr. Oliver Ryder, head geneticist at the Zoological Society of San Diego's CRES (Conservation and Research for Endangered Species) added further value to the study by presenting the results at a local event highlighting the Society's work to conserve endangered species. Finally, updated information on the project can be found on the San Diego Zoo's "Helping Wildlife" section of their website.

Continuing the Connection

This program of adding value to the conservation and research activities will continue with several activities planned this year on Anegada. In May, Kelly Bradley will deliver the gene necklaces made by ZooCorps members to students at the Anegada School. Along with the necklaces, Ms. Bradley will give a presentation on genetic research as related to the Anegada Iguana. We also are working on the second edition of the "Anegada Wildlife News." With the help of a journalism mentor from the British Virgin Islands Department of Sports and Youth Affairs, we hope to have students from the Anegada School research, write, and help produce the upcoming issue. Also this year, we will produce new interpretive materials for the headstart facility in order to help visitors better understand the amount and type of work that is going into the conservation of the Anegada Iguana.

The Anegada Iguana recovery program demonstrates how conservation and research can be combined into engaging outreach programs. One research project, such as the genetic analysis, can serve as content for numerous educational activities and materials that help engender support for conservation locally, and patently connect others to conservation globally. Clearly, outreach adds value to conservation science and plays an important role in the recovery of the Anegada Iguana.

The Settlement is Anegada's main population center. With about 100 full-time residents on the entire island, Anegada offers unique opportunities for outreach.

GENES AND CONSERVATION

The use of molecular genetics in the management of captive populations of endangered species helps maintain healthy living collections that can become the foundation for successful breeding programs. Collection of studbook information and determination of accurate pedigrees are crucial for successful management of animals in captivity, but this information may not be available, especially for animals caught in the wild. The San Diego Zoo's collection contains three male and three female potential founders of the critically endangered Anegada Iguana (*Cyclura pinguis)*, the only captive individuals of breeding age in the world. These specimens came to the zoo with questionable backgrounds. Through examination of DNA microsatellite variation, the zoo's genetics research team has been able to evaluate the relatedness of the captive population by comparing them with wild iguanas on Anegada. Based on genetic data, Apparently, of our six captive adults, three pairs of animals are related (two of the males, two of the females, and one male-female pair), but are otherwise unrelated to one another. This information is now being used to design a captive management plan that maximizes genetic diversity in the captive collection. Future pairings will focus on minimizing reproduction among related individuals and maximizing the retention of genetic diversity within the group. In addition, our genetic work has shown that the wild population on Anegada, although highly endangered with a remaining estimated wild population of only a few hundred individuals, does not appear to be inbred when compared to other species. This finding bodes well for the future, and provides a valuable baseline for monitoring the genetic health of the wild population over time. We are grateful to the Institute of Museum and Library Services (IMLS) for funding this research.