

**HC217 Behavioural interactions and ecology of a critically endangered spiny tailed iguana
(*Ctenosaura melanosterna*) in the Cayos Cochinos, Honduras**

Dr Steve Green, Operation Wallacea

Global declines in reptile populations are similar in their taxonomic breadth, geographic distribution and severity as those experienced by amphibians, and constitute a worldwide crisis. Such declines have been attributed to a number of causes including; habitat loss and degradation, introduced invasive species, environmental pollution, disease and parasitism, unsustainable use and global climate change, as well as enigmatic decline. Although many declines are likely to be the result of a cumulative effect of two or more of these causes, habitat loss and degradation are often perceived to be the greatest threats to populations. In contrast, the impact of exploitation of reptiles for food, wildlife products and the live animal trade are often overlooked as significant causes of population decline.

Human use and consumption of wild animals, including reptiles, is an integral part of many cultures. However, harvesting must be carried out at a biologically sustainable level in order for both the species and the practice of sustainable use to persist long-term. Article 2 of the Convention on Biological Diversity (CBD) defines sustainable use as “the use of components of biological diversity *in a way and at a rate* that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations”. It is clear that for many populations of reptiles, exploitation has been unsustainable and a major cause of their declines.

The Spiny-tailed iguana (*Ctenosaur melanosterna*) is endemic to Honduras and is found only in the Rio Aguan Valley and the Cayos Cochinos archipelago. The species has been unsustainably exploited for food and for the pet trade and is now classified as critically endangered by the IUCN. *C. melanosterna* is in rapid decline within its mainland range and, thus, the Cayos Cochinos may represent the last viable population of this species.

The Cayos Cochinos was declared a protected area in 1993 and in 1994 the Honduran Coral Reef Foundation (HCRF) was established to facilitate the protection, restoration and sustainable management of the area under the legislative decree 1928-93. Within the Cayos Cochinos, *C. melanosterna* is found only on the two largest islands, Cayo Cohino Grande (CCG) and Cayo Cochino Pequeño (CCP) (also commonly known as Cayo Mayor and Cayo Menor respectively).

The largest population of *C. melanosterna* is found on CCP where the species can be seen at high densities, especially around the research station where the population has become habituated to the presence of humans. On CCG the population appears to be smaller, which may be in part due to continued exploitation by local communities. The continued illegal exploitation of *C. melanosterna* within the Cayos Cochinos is evident and remains a real problem for the conservation management of the species.

The *C. melanosterna* population around the research centre on CCP has been the subject of a long-term study where a large percentage of individuals have been captured and marked with passive integrated transponder (PIT) tags. Individuals are also marked with numbers on their

sides for easy visual identification. The study has been ongoing for 5 years and short biographies of many of the animals are known (changes in home range, associations with other animals etc). Possible studies may include home range and behavioural analyses of specific individuals around the research centre.

Male Ctenosaurs defend territories from other males, within which a number of females will live. Generally, larger males will have the largest territories and access to the greatest number of females. Females will also fight amongst themselves for access to resources within the territory. Students may choose to investigate how Ctenosaurs allocate their time between various activities such as feeding, territorial behaviour and thermoregulation.

Animals will also be captured using a noose and pole in order to measure and weigh them. Captured individuals will be scanned for the presence of a PIT tag in order to identify if they have been captured previously and to obtain data on annual growth rates and record measures of health such as body condition and ectoparasite load. This information can also be related to behavioural data collected.

Although the population around the research centre has been well studied, little is known about the number of animals within the interior of the forest (which makes up the majority of the island). The forest population are not habituated to the presence of humans and, thus, studying them is much more difficult than the research station population. However, transects and distance sampling could be utilised to attempt to estimate population size within the interior of the forest on CCP.

It is also possible that funding may become available for a radio-telemetry study. In the event that funding is obtained, radio transmitters will be attached to a number of animals which will then be radio-tracked in order to gain a better understanding of their home range sizes and behaviour. Radio transmitters will be fixed onto the side of the animals using a strong adhesive (initial trials show that this does not harm the animal and the radio will generally fall off on its own within a couple of weeks).

Suggested Reading

Bermingham, E., Coates, A., Cruz, G., Emmons, L., Foster, R. B., Leschen, R., Seutin, G., Thorn, S., Wcislo, W. & Werfel, B. 1998 Geology and terrestrial flora and fauna of Cayos Cochinos, Honduras. *Revista De Biologia Tropical* **46**, 15-37.

Buckley, L. J. & Axtell, R. W. 1997 Evidence for the specific status of the Honduran lizards formerly referred to *Ctenosaura palearis* (Reptilia: Squamata: Iguanidae). *Copeia* **1997(1)**, 138-150.

Gibbons, W. J., Scott, D. E., Ryan, T. J., Buhlmann, K. A., Turberville, T. D., Metts, B. S., Greene, J. L., Mills, T., Leiden, Y., Poppy, S. & Winne, C. T. 2000 The global decline of reptiles, déjà vu amphibians. *BioScience* **50**, 653-666.

Gutsche, A. & Köhler, F. 2008 Phylogeography and hybridization in *Ctenosaura* species (Sauria, Iguanidae) from Caribbean Honduras: insights from mitochondrial and nuclear DNA. *Zoosyst. Evol.* **84**, 245-253

- Hasbun, C. R., Gomez, A., Köhler, F. & Lunt, D. H. 2005 Mitochondrial DNA phylogeography of the Mesoamerican spiny-tailed lizards (*Ctenosaura quinquecarinata* complex): *historical biogeography, species status and conservation*. *Molecular Ecology* **14**, 3095-3107
- Knapp, C. R. & Owens, A. K. 2005 Home range and habitat associations of a Bahamian iguana: implications for conservation. *Animal Conservation* **8**, 269-278.
- Pasachnik, S. A., Fitzpatrick, B. M., Near, T. J. & Echternacht, A. C. 2009 Gene flow between an endangered endemic iguana, and its wide spread relative, on the island of Utila, Honduras: when is hybridization a threat? *Conservation Genetics* **5**, 1247-1254.
- Pasachnik, S. A., 2010 Conservation genetics and the *Ctenosaura* palearis clade. Unpublished PhD diss., University of Tennessee.
- Pasachnik, S. A., Echternacht, A. C. & Fitzpatrick, B. M. 2011 Population genetics of the Honduran spiny-tailed iguana *Ctenosaura melanosterna*: implications for conservation and management. *Endangered Species Research* **14**, 113–126.
- Wilson, L. D. & Cruz Diaz, G. 1993 The herpetofauna of the Cayos Cochinos, Honduras. *Herpetological Natural History* **1**, 13-23.
- Wilson, L. D. & Hahn, D. E. 1973 The Herpetofauna of the Islas de la Bahía, Honduras. *Bulletin Florida State Museum* **17**, 93-150.
- Wilson, L. D. & McCranie, J. R. 2004 The Conservation Status of the herpetofauna of Honduras. *Amphibian and Reptile Conservation* **3**, 6-33.