



FIELD REPORT

Marketing title

Costa Rican Sea Turtles

PI name

Dr. Frank Paladino

Research site/ region

Playa Grande, Playa Ventanas, Playa Carbon, Playa Langosta and Tamarindo Estuary adjacent to the Goldring Marine Biological Laboratory, Guanacaste, Santa Cruz, Costa Rica

Country

Costa Rica

Research site latitude/ longitude

10.5 N 85.8 E

Protected area sta

National Park "Las Baulas De Guanacaste"

Date field report completed

July 2010

Period covered by this report

October 2009 - March 2010

Report completed by

Tera C. Dornfeld, Dr. Frank V. Paladino

Dear Participants,

The Costa Rican Leatherback sea turtle research project experienced a great field season thanks largely to the help and dedication of Earthwatch volunteers. This season registered a total of 41 individual females nesting on the beaches of Playa Grande and Playa Ventanas, Costa Rica. We encountered a female turtle, originally PIT tagged in the 1993-1994 season return to nest in her seventh nesting season! This is the greatest number of remigrations to our nesting beach we have ever seen! We also saw the return of turtles that had carried data-collecting transmitters. It was wonderful to see these turtles, which had taught us so much about the migratory paths of leatherback turtles, returning to the beach to nest successfully. We saw great hatchling production on the beach in our in situ nests and from our beach hatchery. Our beach hatchery serves to augment hatchling production by providing safe refuge to nests that may have otherwise been lost due to tidal inundation or pedestrian traffic. Volunteers were instrumental in this success by aiding in nightly beach patrols to encounter and scan nesting females for PIT tags. Further, volunteers aided by guarding nests in the hatchery and welcoming new hatchlings safely into the world. We would like to thank volunteers from all of our Earthwatch expeditions for allowing us to continue our mission of beach conservation and turtle monitoring.

Sincerely,

The *Costa Rican Sea Turtles* team

SECTION ONE

Top highlight from the past field season

The top highlight would have to be the turtle registered nesting on Playa Grande in her seventh nesting season. It was amazing to see that this animal had survived in the ocean, despite the growing peril of a pelagic existence and to see that she was faithful to our beach, returning year after year to nest.

Non-technical overview of results

Research completed in the Leatherback Sea Turtle research project is instrumental in adding data to the scientific world. We believe that data collection and dissemination are the keys to conservation and worldwide protection. We feel you must understand the animals that you wish to protect in order to properly design protective measures. It is the help of Earthwatch volunteers that allows for our scrupulous data collection.

Acknowledgements

We wish to thank all of our hard working Earthwatch volunteers for filling our beach walks with lively stories, adding renewed enthusiasm to our project every 9 days, and walking with us, rain or shine, to collect our turtle data. We also wish to thank the park rangers of MINAET (Ministerio de Ambiente, Energía y Telecomunicaciou) for their tireless commitment to working every single night on the beach to ensure our safety and the safety of every single nesting turtle. We wish to thank the field team for dedicating five months of their lives to our cause and to Drexel and Purdue University for supporting our research.

SECTION TWO: TECHNICAL RESULTS

REPORTING ON RESEARCH OBJECTIVES

Objective 1

Develop and maintain a long term population data base for the reproduction and genetics of endangered Leatherback turtles nesting on the beaches in this National Park Complex.

Progress report on objective 1

We have continued with another successful year of data collection to add to our ongoing work. This data will be used to augment publications currently in progress for subsequent dissemination into the scientific community.

Objective 2

Understand the behaviour in the water for adults and hatchlings as well uncover their migratory routes, impacts of human activities and pollution of these animals both on land and in the water

Progress report on objective 2

We have published the results of tracking over 50 leatherback females over the past 5 years and found an important migratory corridor that extends from Playa Grande to the Galapagos. We have also used these tracks to assess the interaction of Fisheries and leatherbacks during their migration and foraging activity in the Ocean.

PARTNERSHIPS

We have established a partnership with the Ministry of the Environment (MINAE) in Costa Rica and support the reforestation of the park lands as well as the enforcement of the laws and regulations in the National Park. We have partnered with Conservation International, TOPP (Tagging of Pacific Predators) Program, MINAET (Ministerio de Ambiente, Energía y Telecomunicaciou) and the Governments of Costa Rica, Panama, Columbia and Ecuador to establish the first major Marine Protected Area (Eastern Pacific Seascape Initiative and Protected Area). This treaty provides protection for Leatherbacks in these EEC (European Economic Community) zones adjacent to these countries.

PROJECT DEVELOPMENT

We will be adding an Olive Ridley (*Lepidochelys olivacea*) monitoring component to the project. This will serve to characterize previously undiscovered nesting of an endangered sea turtle species (Abreu-Grobois, A. and Plotkin, P. 2008. *Lepidochelys olivacea*. In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3. <www.iucnredlist.org>.) within the National Park. This project will also allow Purdue University master's students opportunity to design research projects and earn their master's degrees.

New objective 1

Olive Ridley Population Study

Methods

Monitor nesting olive ridleys

New objective 2

Olive Ridley Nest Pathogen study

Methods

Study microbial component of olive ridley nests

DISSEMINATION

Printed:

Santidria, P., Tomillo, N., Paladino, F.V., Suss, J.S., Spotila, J.R. (2010) Predation of Leatherback Turtle Hatchlings during the Crawl to the Water. *Chelonian Conservation and Biology* **9(1)**: 000-000

Tomillo, P.S., Suss, J.S., Wallace, B.P., Magrini, K.D., Blanco, G.B., Paladino, F.V., Spotila, J.R. (2009) Influence of emergence success on the annual reproductive output of leatherback turtles. *Marine Biology*. *Published online* DOI 10. 1007/S00227-0 09-1234-x

Sieg, A.E., Zandonà, E., Izzob, V.M., Paladino, F.V., Spotila, J.R. (2010) Population level "flipperedness" in the eastern Pacific leatherback turtle. *Behavioural Brain Research*. **206**: 135-138

Bailey, H., Shillinger, G., Palacios, D., Bograd, S., Spotila, J., Paladino, F.V., Block, B. (2009) Identifying and comparing phases of movement by leatherback turtles using state – space models. *Journal of experimental Marine Biology and Ecology*. 10.1016/j.jembe.2009.12.020

Shillinger GL, Palacios DM, Bailey H, Bograd SJ, Swithenbank AM, et al. 2008 Persistent Leatherback Turtle Migrations Present Opportunities for Conservation . PLoS Biol **6(7)**: e171. doi:10.1371/journal.pbio.0060171

Reina RD, Spotila JR, Paladino FV, Dunham AE (2009) Changed reproductive schedule of eastern Pacific leatherback turtles *Dermochelys coriacea* following the 1997–98 El Niño to La Niña transition. *Endangered Species Research* **7**:155-161

Saba, V., Shillinger, G.S., Swithenbank, A., Block, B.B., Spotila, J.R., Paladino, F.V. (2008) An oceanographic context for the foraging ecology of eastern Pacific leatherback turtles: Consequences of ENSO. *Deep-Sea Research I* **55**: 646-660

Santidrian, P., Saba, V., Piedra, R., Paladino, F., Spotila, J. (2008) Effects of illegal egg harvest of eggs on the population decline of leatherback turtles in Las Baulas Marine National Park, Costa Rica. *Conservation Biology*. **22(5)**:1216-1224.

Santidrian Tomillo, P., Velez, E., Reina, R., Piedra, R., Paladino, F. Spotila, J. (2007). Reassessment of the leatherback turtle nesting population at Parque Marino Las Baulas Costa Rica: Effects of conservation efforts. *Chelonian Conservation Biology*. **6(1)**:54-62.

Digital:

We feel fortunate to now have a new website where frequent updates are made to describe research progress. <http://www.goldringmarinestation.org/Goldring/Home.html>

Presentations:

The influence of seasonal upwelling on the spatial and vertical distribution of sailfish in the Eastern Pacific Ocean. Samuel J. Friederichs, S. J Morreale & F. Paladino 2009. Presented at ASIH international meeting in Portland OR. June 2009.

OBSERVATIONS ON TRACES OF THE AMERICAN CROCODILE (*Crocodylus acutus*), FROM NORTHWEST COSTA RICA. CORY J. KUMAGAI AND JAMES O. FARLOW 2009. Society for Vert Paleont.

MS Theses completed (2)

The influence of seasonal upwelling on the spatial and vertical distribution of sailfish in the Eastern Pacific Ocean. Samuel J. Friederichs December 2009

INTRA-BEACH VARIATION IN LEATHERBACK TURTLE NEST ENVIRONMENTS: IMPLICATIONS FOR HATCHING SUCCESS AND EGG RELOCATION STRATEGIES

Kendra Garrett May 2009

Other MS students in the lab include: T. Dornfeld, K Gieras, J. Koval, E. Keene, C. Kumagai & S. Valentine

CAPACITY DEVELOPMENT AND EDUCATION

Both the Matapalo grade School and the Playa Grande Grade School have received software, books and computers from funds provided by us.

CONTRIBUTIONS TO INTERNATIONAL CONVENTIONS, AGENDAS, POLICIES, MANAGEMENT PLANS

The Eastern Pacific Seascape Initiative (see above) Marine Protected Area delineated by work published from our research with a treaty between 4 countries designed to protect the Leatherback Migratory Corridor in the Exclusive Economic Zones EEZ of Panama, Costa Rica, Ecuador, Columbia.

ACTIONS OR ACTIVITIES THAT ENHANCE NATURAL AND SOCIAL CAPITAL

The team defended the National Park Law that was in Jeopardy, resulting in the Costa Rican Congress not downgrading Baulas Park to a refuge in recent meetings. The subject is not closed and will be re-addressed in future meetings, but the Park is safe for now.

LONG TERM IMPACT OF PROJECT

The leatherback sea turtle (*Dermochelys coriacea*) listed as Critically Endangered by the IUCN is a charismatic mega fauna and has experienced exponential population decline in the eastern pacific. The population nesting within Parque Nacional Marino las Bauas represents the fourth largest nesting assemblage in the world yet registered only 41 nesting females this past nesting season. The population's small size demands fervent conservation work both on nesting beaches, realized by this Earthwatch project, and further protection at sea. Our work can serve to protect this important nesting beach and insure safe hatchling development and dispersal to sea.

Taxa of conservation significance enhanced, restored or maintained

By patrolling nightly this nesting beach we are able to preserve it for nesting turtles and ensure that night after night turtles may arrive to safely deposit their eggs. This patrolling serves to protect nesting turtles from terrestrial predators and poaching. This protection is absent on many other nesting beaches and we feel our work helps to eliminate these threats. Our daytime work on the beach helps to guard nests from the attacks of local dogs.

Habitats enhanced, restored or maintained

Marine environments of Playa Carbon have been preserved and mapped for animals living there. University classes as well as volunteers have snorkelled documented and listed.

Ecosystem services enhanced, restored or maintained

Parque Marino Las Baulas. Habitats and Vegetation restored.

Cultural heritage enhanced, restored or maintained

The folk dance troop and marching band from the Matapalo School were supported. If you would like a video of their performance please contact me.

Livelihoods enhanced, restored or maintained

Our work has helped to train community members, formally making a living by poaching and selling eggs, as tourism guides. In this manner we are helping to reverse the drastic population decline seen when nearly 100% of eggs on the beaches within the National Park were lost to poaching. Guides demonstrate the amazing nesting process to tourists and help spread the message of conservation.