



Nature Seekers

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Be a Nature Seeker and Help Preserve our Wildlife

Dear Volunteer,

Nature Seekers and WIDECASST would like to thank you for your valuable contribution to the Trinidad Leatherback project in 2003. The results of this year's project far exceeded our expectations. As we assess all that was accomplished this year we are extremely grateful to you for all your hard work and flexibility as we move the conservation and research program to a new level.

Some highlights of this year's project were:

- (a) Nocturnal patrol of more than 900 km of beach.
- (b) Monitored and recorded data on 1456 leatherback sea turtles.
- (c) Flipper tagged more than 831 nesting female leatherbacks.
- (d) Developed and implemented a new library database for Nature Seeker's community library.
- (e) Maintained the Trinidad tagging database.
- (f) Set a new record for number of turtles tagged in one night.
- (g) Had a great time!

Please accept this brief summary report of your accomplishments this year, and consider coming back to help us again!

Sincerely,

Scott A. Eckert, Ph.D.
Dennis Sammy

SUMMARY RESEARCH REPORT

Principal Investigators:

- (1) Dr. Scott A. Eckert, Ph.D.
- (2) Dennis P Sammy.

Position / Title:

- (1) Director of Science, WIDECAST
- (2) Nature Seekers

Affiliation:

- 1) WIDECAST: Wider Caribbean Sea Turtle Conservation Network at Duke University.
- (2) Nature Seekers

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Project Title: Leatherback Sea Turtle Conservation & Community-Based Tourism

Description of Research Site: Matura Beach Protected Area, Trinidad, West Indies

Trinidad is the southernmost island in a chain of islands stretching from Florida to Venezuela and enclosing the Caribbean Sea. The island of Trinidad is geographically and ecologically tied to South America and is located within the influence of the Orinoco river, making it one of the most productive marine ecosystems in the Caribbean. As a relatively wet tropical island, the fauna and flora composition of Trinidad is also more closely linked to S. America than other islands in the insular Caribbean. Trinidad supports the 2nd largest nesting colony of the leatherback sea turtle in the world.

Team Dates In Field:

Team I:	April 14 – 25, 2003	(8 volunteers)
Team II:	No team	
Team III:	May 12 – May 23, 2003	(7 volunteers)
Team IV:	May 26 – June 6, 2003	(11 volunteers)

HIGHLIGHTS

While it is commonly recognized throughout the scientific and conservation communities that leatherbacks are "Critically Endangered" (as defined by the IUCN, this means that the species has exhibited a global population reduction of greater than 90 % within 3 generation times), quantified data on population sizes or status are lacking. Furthermore, the leatherback sea turtle has the widest bio-geographic range of any species of reptile, and its pelagic nature and relatively limitless capacity to range the world's oceans has made proper assessment and monitoring exceptionally difficult. However, like all species of sea turtle, leatherback females return to their natal regional beaches to reproduce where they can be counted. Such assessment methods form the basis for all population estimates or population trends of this species, and thus accurate population censuses are important in managing or restoring this species.

Leatherback sea turtle populations in the Atlantic Ocean nest in 2 – 3 major colonies as well as series of small colonies located in the tropics. Trinidad currently supports the 2nd largest nesting assemblage of the leatherbacks, with nesting beaches centered at Matura Beach on the east coast and Grande Rivera Beach on the north coast. However despite over 12 years of dedicated conservation activities by the Matura based organization Nature Seekers and Government wildlife agents, a quantified population size or trend has yet to establish. The primary challenge to gaining such important information on the species at Matura has been the large size of the population (>3,000 leatherbacks nesting annually over the last 5 years) the length of 8 km long nesting beach, and the limited number of personnel available to patrol this beach at night to monitor the nesting.

One of the primary methods of censusing nesting sea turtle populations is through the use of nocturnal patrols and identification marking of nesting females. Such a technique requires almost continuous nocturnal patrol of the nesting beach. In 1999 Nature Seekers initiated an identification tagging program with a goal to annually mark as many turtles each night as possible, and eventually use this information to quantify the number of turtles nesting annually on this colony. As noted earlier, however the size of the nesting beach and lack of personnel to patrol the beach has meant that only 40% of the beach was covered, leading to minimum population size estimates, but not at a level of accuracy needed. This year with the support of 3 Earthwatch teams consisting of 26 volunteers, coverage of the nesting beach was dramatically increased. Volunteers patrolled more beach than had ever been covered previously, tagged 831 leatherbacks with one team establishing a new record for the number of turtles marked in one night (83) and established the patrol and data collection methods to be used in following seasons for determining population size. Next seasons teams will be increased to 8 with the expected result that more than 80% of all nesting turtles will be monitored.

The tagging of sea turtles at Matura also plays an important role in understand the full geographic range over which this species must be managed. The fact that the worst threats to Caribbean sea turtles transcend international borders (and waters), and thus are not within the control of any one nation, underscores the importance of such tagging efforts. The most prominent among these threats is incidental catch by artisanal and commercial fisheries. Tagging not only facilitates the identification of entangled and stranded turtles in Trinidad, but also provides valuable information when "our" turtles are captured in distant waters. In 2003, 3

leatherbacks that had been tagged while nesting at Matura Beach were recaptured off Nova Scotia, demonstrating the close linkage between the nesting colony in Trinidad and Canadian foraging grounds.

The largest leatherback population on Earth collapsed during the 1990's because, although Mexico was spending millions to safeguard critical nesting habitat on its own beaches, commercial fisheries in Chile and Peru were catching unsustainable numbers of large juveniles and adults. The population plummeted at an alarming 20% + per year until only a handful of breeding females remained. Mexican managers were unaware "its" leatherbacks were foraging in South America. By tagging the leatherbacks at Matura, we will better understand the global nature of the threats to sea turtles, as well as the migratory patterns of the turtles themselves.

In Trinidad, the tagging project provides a means of monitoring population trends, thus providing important feedback to managers at the local level. The tagging project also provides crucial data on nest site fidelity (helping us to define the optimal extent of the protected area), fecundity (helping us to predict the number of females from the observed number of nests), survivability and recruitment (important for measuring population stability), and other population indicators. Finally, the project provides a model to other communities in the Republic who would seek to undertake similar community-based conservation initiatives.

In addition to its scientific value, this project will help ensure the effective enforcement of existing laws, as well as influence the introduction of new and more effective legislation. Once scientific data is obtained that demonstrates the significance of Matura Beach to the leatherback population, managers can more effectively influence conservation legislation. Already, this project has brought great attention to the importance of this nesting colony and the major threats facing these endangered turtles. The data collected by Nature Seekers has been used frequently in the popular press and in discussions at higher levels of government.

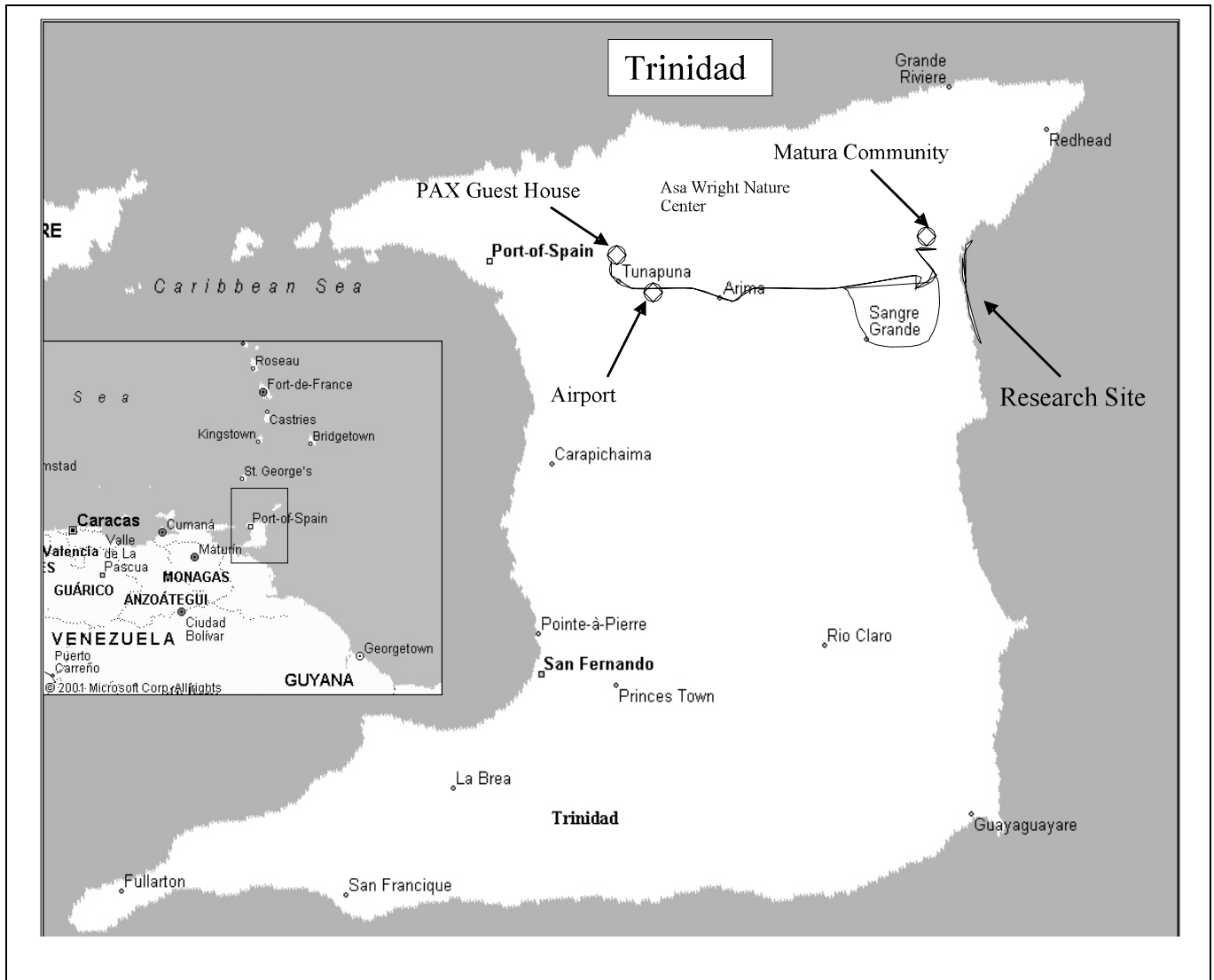
OBJECTIVES

Given the importance, on a global scale, of Matura Beach as a nesting site for leatherback sea turtles, there is a critical need to ensure maximum protection of the main nesting beach and to facilitate collection of population data. Nature Seekers by itself is unable to provide such coverage, due primarily to a lack in human resources. There is therefore a great need for people to patrol beaches and to assist Nature Seekers in carrying out other project activities. Earthwatch volunteers will allow Nature Seekers to expand the stretch of beach that it can monitor effectively.

The primary goals of the project are to determine:

- Population size
- Population status
- Distribution of nesting effort
- Habitat residency time
- Survival rates
- Reproductive life history

While the Matura Beach nesting colony is clearly one of the largest and most important in the Atlantic Ocean, a lack of complete beach coverage has hampered our ability to assess total population size. Thus, apparent changes in the number of turtles nesting over the last 5 years cannot be attributed to actual changes in population size. Rather these may be due to changing measurement effort as the coverage of the nesting beach fluctuates from season to season. With the assistance of Earthwatch volunteers we intend to standardize beach coverage and thereby insure a quantitatively rigorous evaluation of nesting colony size and status.



METHODS

During the turtle nesting season (March to September), Matura Beach is patrolled by foot nightly. The patrols have three objectives:

- (a) Protect nesting turtles from exploitation (Protection)
- (b) Tag animals and collect scientific data (Research)
- (c) Provide turtle watching eco-tours (Education)

Patrols start at 7:30pm and end about 3:30am. The beaches is divided among 5-6 patrol teams, . When nesting turtles are found, trained patrol members follow a standardized protocol for tagging the turtles and collecting morphometric data. All information is recorded on a standardized data sheet, which includes:

- Name(s) of the patrol members
- Date
- Weather
- Tide
- Time
- Turtle activity (i.e., approach, body pit, digging, egg laying, covering, returning)
- Curved carapace length
- Curved carapace width
- Zone (section of beach)
- Flipper tag number(s)
- PIT tag number(s)
- Number of visitors (that observed the turtle)
- Any physical description associated with the turtle

The data are entered into a custom Access™ database that allows for the summarization of the data on an annual basis. All activities and reporting procedures follow high professional standards (which has greatly contributed to the success and reputation that Nature Seekers has established through the years).

Tagging sea turtles is a crucial part of the research. Using an applicator (tag pliers), a uniquely numbered Monel metal tag is placed on the trailing edge of each rear flipper. Double tagging is a standard procedure, based on probabilities of tag loss. Tagging also includes the insertion of a uniquely coded PIT (Passive Integrated Transponder) tag into the shoulder of the turtle. Every effort is made to avoid disturbing turtles during the nesting and tagging process. Extra care is also taken on tag placement and sterilization. Most often tags are placed when turtles are in the process of dropping eggs. Metal tags are visually read; while PIT tags are read using electronic scanners. Curved carapace length and width are measured using flexible measuring tapes, and other standardized field methods are used in keeping with international protocols (Eckert et al., 1999).

VOLUNTEER TASKS and ACCOMPLISHMENTS

For this initial season (with Earthwatch volunteers), there were 26 volunteers divided between 3 teams: 8 volunteers in the first team, there was no second team, 7 volunteers in the third team and 11 volunteers in the fourth team. The teams worked well together with the capabilities of the volunteers far exceeding the program's expectation. While it was initially anticipated that Earthwatch team members might require that they be paired with experienced NS team members for all patrols, it soon became apparent that this was unnecessary. After initial training, small teams (2-3) of volunteers took complete responsibility for covering 1 – 2 km sections of beach, which sometimes entailed recording data on as many as 98 turtles in a single night! At times the turtles could be so dense that volunteers demonstrated their incredible capacity by collecting data on as many as 20 turtles simultaneously! The volunteers exhibited true teamwork, were passionate about the work and had a fun time working with each other.

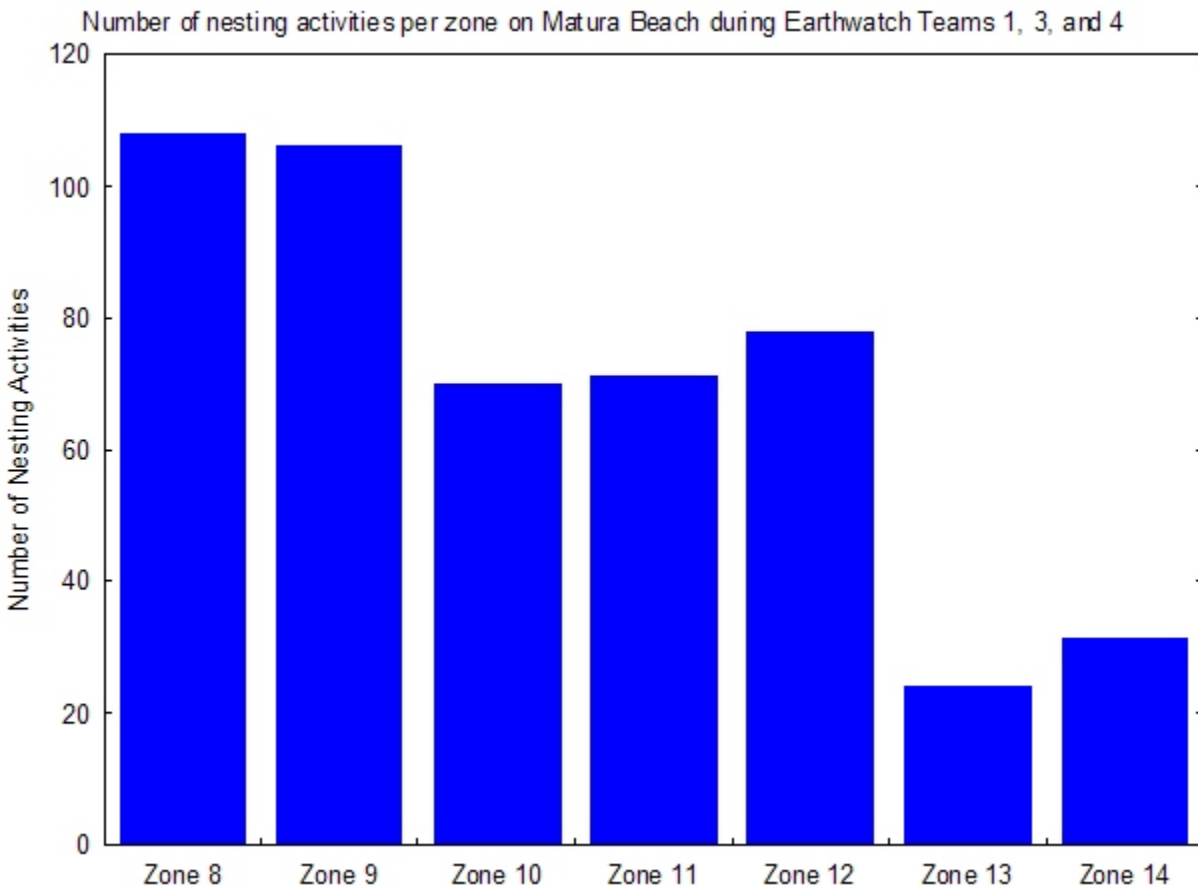
A total of 1456 turtles were processed by Earthwatch volunteers. Of that total 831 turtles were tagged for the first time on Matura beach by the volunteers. It is estimated that the volunteers maintained complete coverage of 5 km of the 8 km long beach logging a minimum 900 km of foot patrol during that time¹. The Principal Investigators, project staff, and Earthwatch volunteers participated jointly in all aspects of this project. Besides maintaining nocturnal patrols Earthwatch volunteers also

- (a) Attended regular training and information sessions provided by the PI's.
- (b) Relocated nests to safer sections of the beach assist with nest (egg) relocation when necessary.
- (c) Maintained the computerized sea turtle database.
- (d) Developed and maintained a new data base for the Nature Seekers community library.
- (e) Assisted with the project's daily management activities, (i.e. recharging equipment, cleaning, sorting tags, documenting lost tags, and preparing field gear bags for the next night).
- (f) Volunteers on team 4 also initiated new data collection procedures including an experiment to better define what time of night turtles preferred to nest.

¹ This value represents a minimum as it is based on a 1 hour patrol schedule. The reality is that the turtle density is so high that it is likely that the volunteers were actually moving from turtle to turtle continuously, and thus the beach coverage was much more frequent than once per hour and that true distance covered is probably triple this estimate.

RESULTS

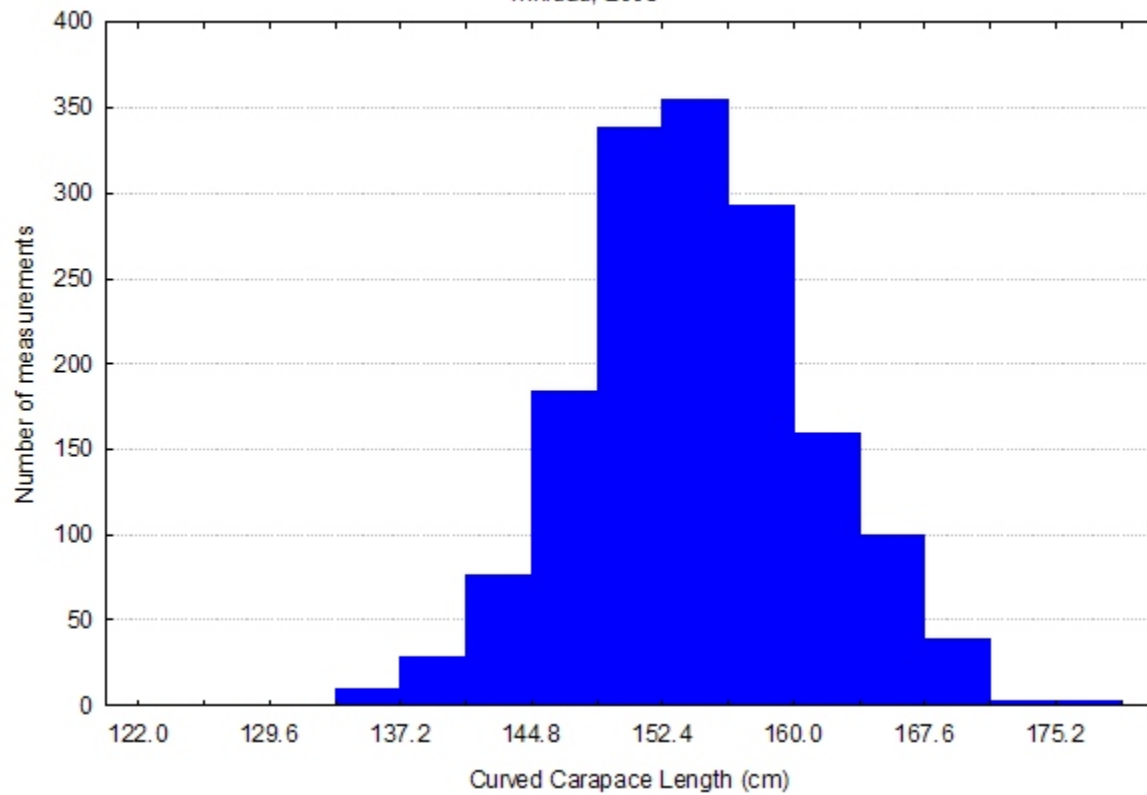
During the tenure of the 3 Earthwatch teams (Apr 14 - 24, May 13 - 23, May 26 - 5 June) and between zones 8 - 14 (where the Earthwatch teams patrolled), a total 1456 individual leatherback turtles were encountered while nesting or attempting to nest at Matura Beach. Leatherback nesting activity varied by zone and by team at Matura Beach. The highest number of nesting attempts recorded was in zone 8. This value represents a minimum number of leatherbacks nesting for the season. Of the leatherbacks that were encountered, 831 (57%) were not tagged. Of the 1456 turtles that were encountered by Earthwatch teams, 100 (7%) had lost all flipper tags but retained their PIT tags. Of the previously tagged turtles (625) it can roughly



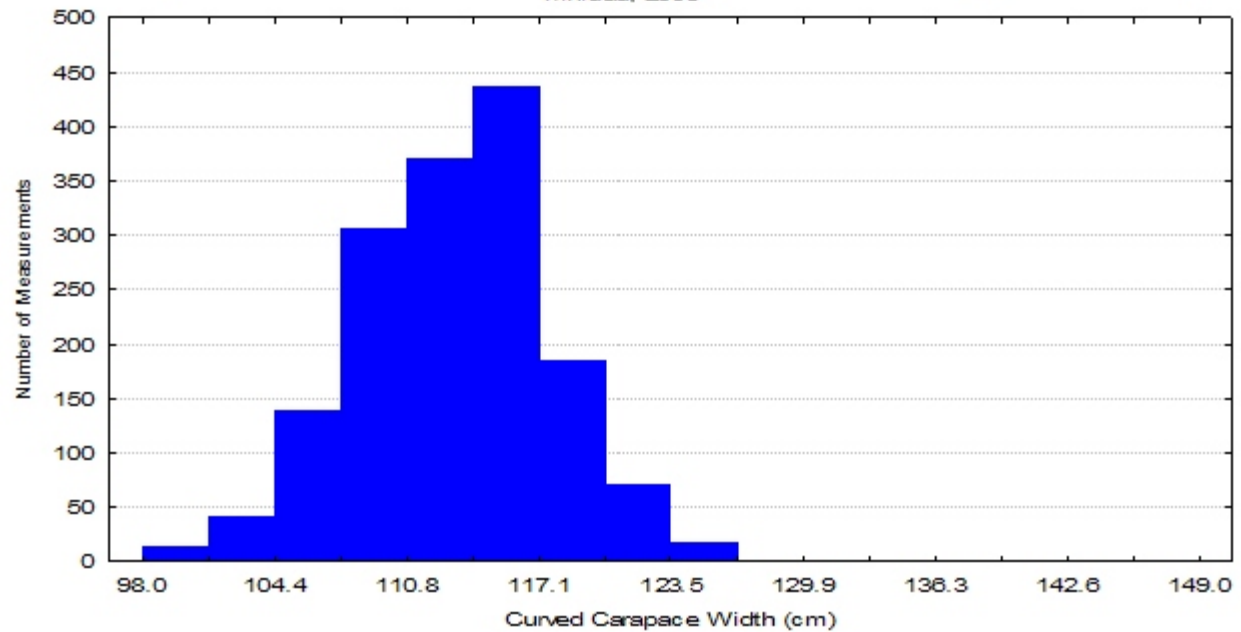
be estimated that 16% of turtles nesting at Matura and marked with flipper tags, will lose all of those tags before they return to nest in a subsequent nesting season, thus demonstrating the importance of continuing PIT tag use on this project.

The average size of a nesting leatherback in 2003 was 154.4 cm curved-carapace length (CCL) (sd = 6.88, range 122 cm - 179 cm, n = 1583 measurements) and 113.1 cm curved-carapace width (CCW) (sd = 4.93, range 98 - 143 cm, n = 1584 measurements). Distribution of carapace length and width approximate normal distributions

Curved Carapace Length (cm) of Leatherback Sea Turtles Nesting Between Zones 8 - 14 at Matura Beach, Trinidad, 2003



Curved Carapace Width of Leatherback Sea Turtles Nesting Between Zones 8 - 14, at Matura Beach, Trinidad, 2003



DISCUSSION

The 2003 Earthwatch Project at Matura Beach, Trinidad was extremely successful for a number of reasons. Most importantly, this season established the basis for integrating highly motivated Earthwatch volunteers into a village based conservation program. It is difficult to define in “real” terms the importance of this accomplishment. Instead of a more traditional approach of supporting a “scientist” driven Earthwatch project, the Matura Beach leatherback project is co-managed by the Nature Seekers and the Wildlife Section of the Forestry Division. Nature Seekers is a locally administered non-governmental organization whose mission is to conserve one of the world’s most important leatherback nesting beaches. The support of the EW volunteers enhanced the capacity of Nature Seekers to fulfill its mission a) by supplementing the Nature Seekers outreach and education programs through their work with the Nature Seeker’s community library b) by providing beach coverage, which allowed N.S. staff members to spend more time doing on-beach environmental education c) enhance the revenue stream by which the conservation work is supported both from direct contribution of EW funds as well as by freeing more NS staff from beach patrol to eco-guiding and d) vastly increasing the capacity of NS to collect important data on the leatherback nesting population which is critical to management of this nesting beach as well as to enhance the value of Nature Seekers to the Government of Trinidad, under whom they operate on Matura Beach with special (and unique) permission. Specific to this latter benefit (d), data collected by highly dedicated EW volunteers will provide the basis for the first statistically rigorous nesting population estimate of the Trinidad leatherback - a value that has eluded the program despite almost 13 years of hard work by NS.

Finally, because of the enhanced capacity granted to Nature Seekers, through the support of Earthwatch, Nature Seekers was able to serve as trainers for personnel from sea turtle projects in other parts of the world, including St. Lucia, Dominica; Papua New Guinea and Indonesia as well as from other nesting beaches on Trinidad and Tobago.

PUBLICATIONS

At this writing the nesting season is just finished, so additional data is still be entered and processed. Once this is accomplished, results of this work will be presented at the 24 Annual Symposium of Sea Turtle Conservation and Biology to be held in February 2004 in San Jose, Costa Rica. A scientific publication on the population status of the leatherback in Trinidad is also anticipated.

ACKNOWLEDGMENTS

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- (a) Suzan Lakhan, Marissa Ramjattan and other member of Nature Seekers
- (b) Institute of Marine Affairs, Mrs, Lori Leelum
- (c) Wildlife Section of the Forestry Division, Mrs. Nadra Gyan and Mr. Steven Poon
- (d) Canadian High Commission Wildlife,
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- (e) WIDECAST (\$8,664)

Equipment and Supplies: (\$5,024)

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