



Morning
Census
Protocol for:



**Marine Turtle Monitoring
Program 2006**

North Beach of Tortuguero

Caño Palma Biological Station
Tortuguero, Costa Rica

COTERC	GVI
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Daily Track Census Protocol 2006 North Beach, Tortuguero

Introduction

Marine turtles have been nesting on the beaches of Tortuguero for hundreds of years. Tortuguero was established as a National Park in 1970 with the purpose of protecting the lowland forests and unique wildlife. It is the world's most important nesting site for the Green Sea Turtle (*Chelonia mydas*) and one of the major nesting colonies in the Caribbean for the giant Leatherback Sea Turtle (*Dermochelys coriacea*)¹. Also nesting on these beaches are the Hawksbill Sea Turtle (*Eretmochelys imbricate*) and very occasionally the Loggerhead Sea Turtle (*Caretta caretta*).

As always, man poses the greatest threat to these majestic animals through the exploitation of eggs, meat and the destruction of habitat. As the town of Tortuguero and surrounding communities continue to grow and develop, the marine turtles' fight for survival is once again increasing and the need for human intervention and protection is even greater.

Whilst the protection in the Tortuguero National Park is contributing to the stability of the Green Sea Turtle population, many beaches surrounding the park are under going a high percentage of poaching. Caño Palma and GVI are monitoring the 'North Beach' to collect data on a 3 ¹/₈ mile stretch of unprotected beach to determine the rate of poaching. This data will then be shared with the CCC (Caribbean Conservation Corporation) to compare with the poaching rates on protected national park beaches.

Hypothesis

Poaching rates on the north beach are dramatically higher than those in the neighboring south beach and the National Park.

Project Aims

- 1) To determine the degree of threat posed on nesting marine turtles on the north beach of Tortuguero, Costa Rica.
- 2) To establish the proportion of different species nesting on the north beach.
- 3) Determine hatchling success and orientation

Methodology

Equipment needed:

Notebook and pencil, GPS, Skymaster, camera, dead turtle kit (notebook, tape measure and plastic gloves) and watch. Triangulation kit and compass.

¹J.R Spotila Sea Turtles a complete guide to their biology, behavior and conservation John Hopkins University Press, 2004

Please make sure that all necessary safety equipment is taken as is noted later in this document.

1. MORNING TRACK CENSUS

The project will be conducted during the main nesting seasons of the Leatherback Sea Turtle, which is from March to June, the Green Sea Turtle from June to November and the Hawksbill and the Loggerhead Sea Turtles from June to September.

The research is to be conducted on the "North Beach" which is located across the canal from the Caño Palma Biological Station. Mile markers have been set up starting at the mouth of the Tortuguero River (mile 0) and continuing to Laguna Cuatro (mile 3 ^{1/8}). Markers are set up every 1/8 of a mile (or every 200m). The survey will start early in the morning, usually around 5.30 and will consist of up to 5 people (minimum one RA).

Researchers will walk as a group starting at mile 0 and head north. They will look for turtle tracks and note the species of turtle and the night the track was made. The spatial distribution in the beach (distance to the northern mile marker) and for the nests, the vertical position (open area, border or vegetation), will be also recorded.

Tracks:

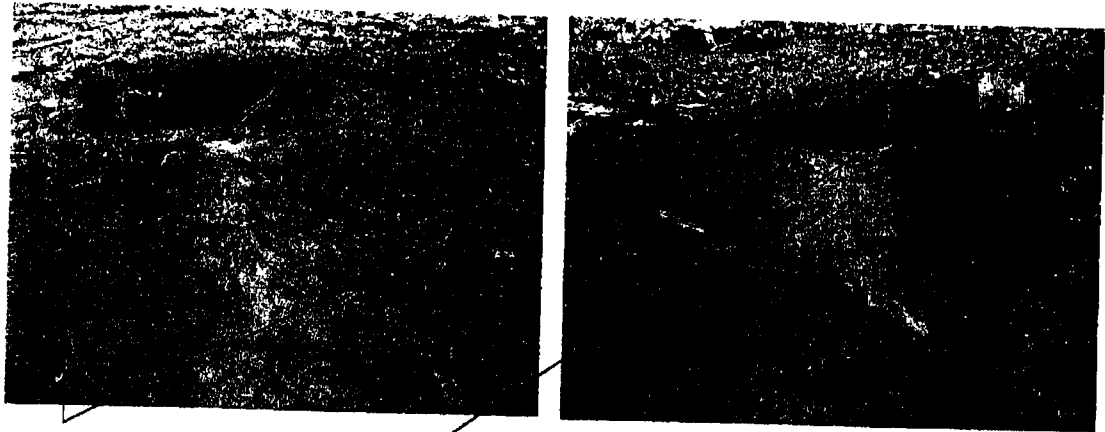
Lifted Turtle

When there are tracks coming out of the sea but not returning. There may be obvious disturbance in the sand to show struggle and/or horseshoe marks.



Half Moon

When the turtle comes up from the ocean it may or may not make a nest. The turtle doesn't begin the egg laying phase because she is disturbed and/or finds conditions unfavorable and returns to the sea.



Sand spray / largish body pit / deep body pit

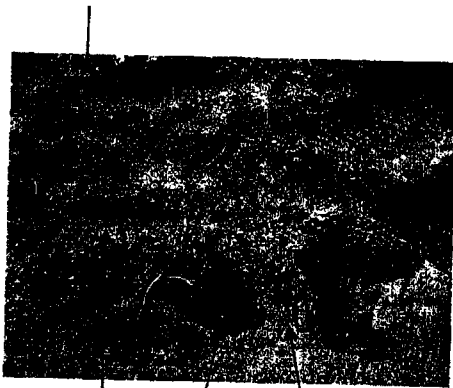
Nested:

Natural nest

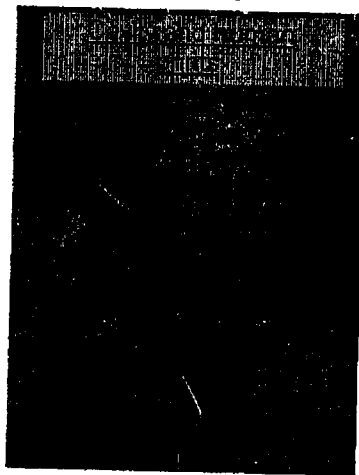
When there is two sets of tracks, a body pit, spray sand... Nest is in a good condition it's called natural nest.

Poached nest

When the turtle comes out and has successfully nested but the nest has obviously been disturbed. Researchers will need to record why they believe it is poached and this falls under the follow categories: 1) small holes pierced in the sand 2) tracks of human and/or animals around the nesting site 3) large hole dug in sand in search of egg cavity. 4) eggs shells left around the nest of recently eaten eggs 5) sand patted down indicating a covering of a raided nest. Note as many of the above indications as necessary to document the nest.



Prints, cavity and holes



Holes and patted down

Eroded nest

When the sea had washed a nest and there are evidences of erosion (Ej. Eggs on the sand or on the shore).

Predated nest

When the nests it have been dig by dogs, raccoons... The presence of crabs' holes it has also to be recorded.

Once the above has been established for a track the data should be recorded in the field note book and any extra observations noted in the comment section.

General Data Collection for track and nest surveys

The following data will need to be recorded before starting the survey:

- Date: DD/MM/YYYY
- Weather: Temp, % Humidity (using Skymaster) and rainfall data from the rain gauge placed at the beach. Ground state and cloud will need to be noted in the field.
- Researchers: Group initials (RA&EMs).
- Start and end time: 24 hour clock, Please write end time as the time you reach Laguna Cuatro, NOT the time you return to the station.

The following data will need to be recorded when a track is found:

- Number of half moons and attempted nests and the respective specie.
- Number of natural, eroded, predated and poached nests and their respective species, as well as the reasons.
- Mile marker: Record in the field as passes before the northern mile marker, convert to meters (if it's necessary when back at station) of all tracks, and for the nests also the GPS position.
- Vertical position of all tracks: Open area, Border or Vegetation.

If there is no tracks during the morning census it have to be recorded, number of tracks = 0.

Upon returning to the station the data should be written up and later entered into the computer database.

If you are unsure for any reason or researchers disagree on a track ID either take notes and photos and ID later on returning to the station or write unknown and move onto the next track. Please don't guess as to the type of track as it will affect the efforts of previously collected data.

2. DEAD TURTLES OR TURTLES BODY PARTS

Stated when a dead turtle or parts are found on the beach. Note the specie, size, sex, state of turtle and estimate time dead. Look for obvious signs of an unnatural death i.e.: harpoon marks in head or trauma to shell or limbs, *photos should be taken for files*. Open the mouth and examine the interior as well as the neck. Check for identification tag in all flippers and record.

3. NEST EXCAVATIONS

During the leatherback season all leatherback, hawksbill and loggerhead nests will be marked for excavations. During the green turtle season, in principle one nest per shift during the nocturnal surveys will be marked (during a quiet season, however, more than one nest may be marked per night). Flagging tape will be located in the vegetation at 3 points (North, South & Center (vegetation)). During all morning censuses the nests will be checked for any signs of illegal harvest, predation by dogs or crabs or erosion.

Once it is time to excavate the nest the following procedure is to be followed: All nests are measured in two ways, one being from the surface of the sand to the first encounter of eggs, the second from the first egg to the bottom of the nest (see example page from field book).

The egg chamber will be emptied out and the remains divided into three groups: all whole eggs that have not hatched; all hatchlings (dead or alive) remaining in the nest; all eggs shells. The unhatched eggs will be opened to determine the state of the embryo. All pipped eggs will be counted also.

General Data Collection for Excavations

The following data will be collected for all excavations (see example of field book below).

- Researchers: Group initials (RA&EMs).
- Time: 24 hours clock
- Nest Code: Code given on nocturnal survey, if no code write a --- (dash) do not leave blank.
- Date Laid: Date the nest was laid (DD/MM/YYYY)
- Date Emerged: Date emerging tracks are found (DD/MM/YYYY)
- Date Excavated: Date of excavation (DD/MM/YYYY)
- Empty Shells: Number of pieces of shells with more of the 60% of the whole shell
- Number of yokeless eggs (only for Leatherback)
- Number of unhatched eggs without development divided into:
 - Without apparent development
 - With larvae
 - With fungi
 - Depredated Eggs (crabs, ants...)
 - Destroyed by other female
- Number of unhatched eggs with embryo divided into:
 - Stage I: less than 25% of the embryo development
 - Stage II: between 25 and 50%
 - Stage III: between 50 and 75%
 - Stage IV: between 75 and 100% (hatchling completely developed) if the egg is broken but hatchling did not emerge → Number of pipped eggs
 - Number of deformed Embryos: twins, albinos... and his respective stage or number of deformed hatchlings

- Number of embryos with larvae and their respective stage or hatchling with larvae
- Number of embryos with fungi and their respective stage or hatchling with fungi
- Number of hatchlings dead or alive in the nest outside a shell

Initials _____ Time _____
 Nest Code _____ Eggs laid _____
 Date Laid _____
 Date Emerged _____
 Date Excavated _____

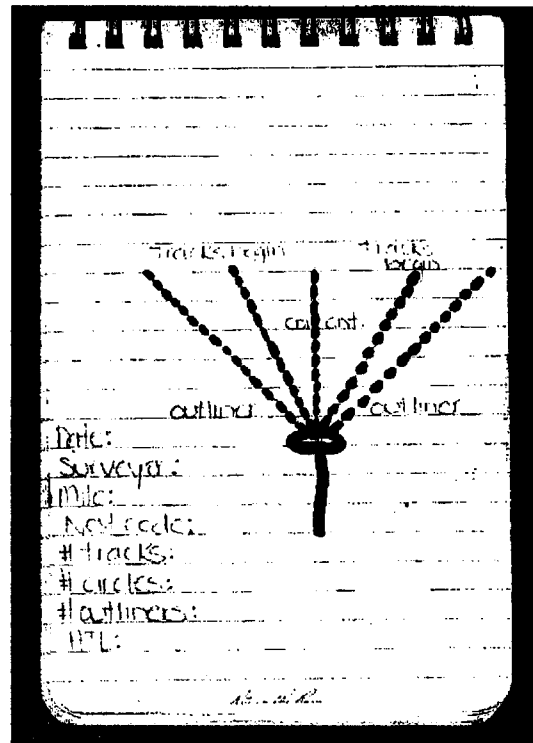
Empty shells (more than 60%)						
Number of yokeless eggs						
Number of alive hatchlings						
EGGS WITHOUT DEVELOPEMENT	No app. Dev.	Larvae	Fungi	Depred.	Destroyed	
Number of unhatched eggs						
EGGS WITH EMBRYO OR HATCH.	Stage I	Stage II	Stage III	Stage IV	Pipped	Dead
Number of deformed embryo						
Number of embryo with larvae						
Number of embryo with fungi						
Number of embryo with ants						
Apparently normal						

4. HATCHLING ORIENTATION

Orientation of hatchlings is taken to determine where the majority of the hatchlings are emerging with reference to the nest location.

Sticks will be placed in five (5) locations in the hatchling tracks, at a distance of 10m from the nest towards the sea: two sticks in the outermost tracks; two sticks in the tracks bordering the majority of the hatchling tracks and one stick in the center. If it is not possible to place sticks 10m from the nest (due to high tide) then they should be placed as far as possible from the nest; this must be noted in the field book.

Standing at the location of the nest, the angles of the five sticks should be taken using a compass; the leftmost stick marks 0 degrees.



Measurement of the high tide line is also taken for reference.

General Data Collection for Hatchling Orientation

The following data will be collected for all hatchling orientation (see example of field book).

- Date: Date the survey is conducted (DD/MM/YYYY)
- Researchers: Group initials (RA&EMs).
- Mile: Closest mile marker to the north
- Nest Code: Code given on nocturnal survey, if no code, write a --- (dash) do not leave blank.
- # Tracks: Number of tracks observed
- # Circles: Number of circles counted in the tracks (indicating hatchlings might have been confused by light sources other than the waves)
- # Outliers: Number of tracks found outside of where the majority of hatchlings approach the sea.
- HTL: High Tide Line

Health and Safety

All researchers must carry:

- Shoes
- 2L of water
- Sun block
- Appropriate sun protection (hat, sarong, etc...)

The team of researchers must carry the following items between them:

- Radio
- First aid kit
- Monitoring equipment as noted above

Important Points to Remember

The following precautions need to be taken during the survey

- 1) Health and hydration of all group members should be a primary concern
- 2) Backtracking should be avoided if possible
- 3) Walking on sand can be strenuous so rest if needed
- 4) Turtle Beach Lodge is at mile 2 ¼ in case of an emergency. Please use only in this instance.
- 5) Breaks are to be kept short in order to save time and to keep muscles loose.