



# Report

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## *Progress Report*

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## Progress report

# Project title: Impacts of Climate Change on West African Green Turtles

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### Summary

Field work was conducted during 3 months, from September to December 2013, as permitted by the logistics in place by the Institute of Biodiversity and Protected Areas (IBAP) of Guinea-Bissau. All field work activities proposed were successfully completed and some of the proposed outcomes have been already achieved. As data analysis is being conducted, for some of the research questions a need for replication and more data, to improve models, has been noted. For other research questions the collected data is being analyzed and both an oral communication and a manuscript will be prepared with these data. The involvement of the local community in the research was for me one of the highlights of this project, enabling exchanging thoughts on conservation and sustainability, and also on the different cultures and societies, and coming up with ideas for future projects.

### All field activities proposed were achieved:

1. **Train IBAP staff and community workers on field activities:** this was achieved and conducted continuously throughout field work season. Knowledge was exchanged in both directions, as the locals have empiric knowledge on sea turtle behavior and biology and IBAP staff has a long-term experience in some of the monitoring methods.

2. **Investigate drivers of nest-site selection:** 200 nesting females were tagged in both front flippers and their nesting site characteristics were recorded to assess which micro-environmental conditions determine suitable nesting habitat.
3. **Evaluate consequences of nest site to hatchling sex-ratio and fitness:** a total of 54 nests had a temperature data logger inside the egg chamber recording temperature every hour. These nests were monitored until hatching and exhumed to identify nest contents and calculate hatching success and emergence success. From these, 48 successfully hatched. Nest-site vegetation or shading did not significantly affect hatching success. There was, however, a negative effect of nest elevation on hatching success. The sex-ratio analyses from the histological examination of gonads is undergoing at the moment.
4. **Determine consistency of nest site selection:** from the 200 nesting females that were tagged we recaptured 69, during 75 recapture encounters. Females showed high fidelity to nesting beach, vegetation type, beach zone and elevation. It seems that individual preferences are driving the variability in nest-site selection at Poilao Island.
5. **Model nesting environments under future climate scenarios:** we deployed 54 data loggers inside nest chambers during all the incubation period. We further deployed 15 data loggers measuring sand temperature at nest depth and 1 data logger measuring air temperature. We hope to replicate this experiment in order to obtain robust data to model the relationship between air temperature and sand and nest temperature, for the estimation of the impacts of future global warming on the viability of this population.
6. **Estimate impacts of predicted sea-level-rise (SLR):** We measured beach profiles every 100m using the Abney level method and observed the minimum elevation of the nesting area. To improve the accuracy of the elevation data and the modeling of impacts of SLR we are hoping to repeat measurements using a more precise instrument and methodology, i.e. theodolite and inclined stadia tacheometry.

#### **Some outputs already achieved:**

**Involvement of local community** - During the stay in Poilao Island we worked with 14 young men from the Bijagos, Island of Canhambaque, village of Ambeno. Each of them collaborated in the research and conservation work for a period of 2 weeks and was given a stipend for that period. They were trained in the field techniques and we had daily gatherings to discuss conservation issues, sustainability, biology of sea turtles, etc. These young men will be the future decision makers of their communities. Although the National Marine Park of Joao Vieira and Poilao is managed by the governmental Institute of Biodiversity and Protected Areas (IBAP) of Guinea-Bissau, the traditional law is very respected, and taken into consideration at the time of rule-making. With the young generations becoming active in the

biodiversity conservation work the management of this important protected area will be made in agreement between government and the local communities.



Figure 1. Members of the Bijagos village Ambeno, wardens of the Marine National Park of Joao Vieira and Poilao and Portuguese student conducting field work at Poilao Island, Guinea-Bissau

**Collaboration of local technicians and National Park wardens from IBAP:**  
We collaborated with 5 park wardens and 4 technicians from the IBAP. Besides their usual monitoring work they learned new field techniques, which they can apply independently in the long-term monitoring of this population.



Figure 2. Aissa Regalla, Coordinator of Species and Habitats from IBAP; Paulino Costa and Cesar Banca, park wardens from IBAP; Rita Patricio (grantee), Carlos Banca, IBAP boat Capitan; and Ana Marques, Portuguese Master student

***Dissemination of conservation work, acknowledging the importance of Poilao Island internationally:***

The grant holder will give a presentation at the International Sea Turtle Symposium, in April 2014, at New Orleans with results of the work conducted in Poilao Island, [http://iconferences.seaturtle.org/preview.shtml?event\\_id=23&abstract\\_id=5440](http://iconferences.seaturtle.org/preview.shtml?event_id=23&abstract_id=5440), facilitated by the RSG. This will be the first time that an oral communication will be given at this symposium concerning this major nesting area for this species. The first draft of a manuscript on the consequences of nesting site to hatching success and sex-ratio is expected to be ready by the end of May.

***Enhanced environment protection:***

During our presence in the Island of Poilao we observed and reported, to the responsible authorities, illegal recreation fishing boats and illegal commercial fishing. For the later one the response of authorities was quick, the pirogues were stopped from further fishing and paid a fine. There was also the occasion when illegal fishers came ashore the island and the presence of the team was potentially important to deter any misconduct with the nesting females or eggs. Furthermore we daily looked for hatchlings and adult females entrapped in intertidal rocks and help them towards the sea, preventing these from certain death.



Figure 3. a) Portuguese student with IBAP park warden releasing hatchlings found trapped in intertidal rocks; and b) IBAP technician and park warden helping green turtle entangled in intertidal rocks