The Abundance and Distribution of Sea Turtles around South Eleuthera

By: Levi Chandler, Rachel Cohen, Dana Colihan,
Felipe Gomez, Brandon Jennings, and Tamara Pletzer
Advisors: Lucie Brown and Marie Tarnowski

Introduction

There are seven species of sea turtles worldwide and all are found on the International Union for the Conservation of Nature's (IUCN) red-list for threatened species (IUCN Red-list of Threatened Species). This is due to the threats sea turtles face, which include overexploitation, bycatch, habitat destruction, pollution, and climate change (Haman, et al. 2010).

The Bahamian government passed a law in September of 2009 banning the sale, consumption, and possession of sea turtles and their eggs to help populations recover. Green sea turtles are important because they graze on sea grass (Figure 1). They eat the young tissue at the base of the leaves, allowing the older parts of the leaves to float away, improving the nutritional qualities of the sea grass beds (Moran, et al.2005).

Due to the ecological services of green sea turtles (Figure 2), it is important to monitor them to observe the effectiveness of the ban and to create a baseline for future studies. This study focused on green sea turtles

Figure 1: A green sea turtle in sea grass

Figure 2: Green Sea Turtle

Purpose: To determine baseline abundance and distribution of sea turtles in coastal areas of South Eleuthera.

Hypothesis: There will be a difference in the abundance and size of sea turtles on the Atlantic and Exuma Sound Sides compared to the Bank Side of South Eleuthera.

Methods

Figure 3: Survey sites on the 3 different sides of South Eleuthera. The banks, the Exuma Sound, and Atlantic Ocean.

Figure 4: Tools used to record biometric data during turtle workup.

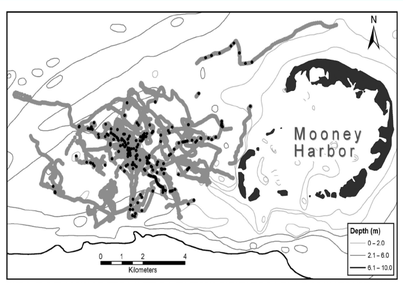

Figure 5: Example of the HUNT's (Haphazard, Unmarked, Nonlinear, Transect) taken from Bresette, et al. 2010. The grey lines are the paths followed during the transect and the black dots are the turtles spotted.

Figure 6: Two observers spotting for Sea turtles during a transect.

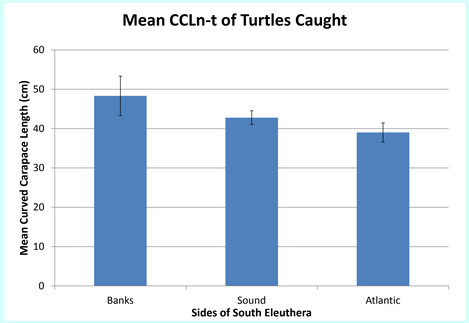

Figure 7: Mean carapace length (CCLn-t) of turtles caught. (Banks n=3, Sound n=6, Atlantic n=6)

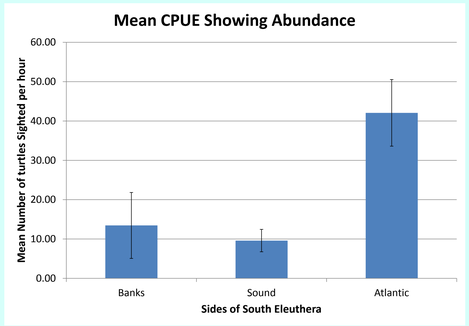

Figure 8: Mean CPUE on the three different sides of South Eleuthera (Banks n=4, Sound n=6, Atlantic n=19).

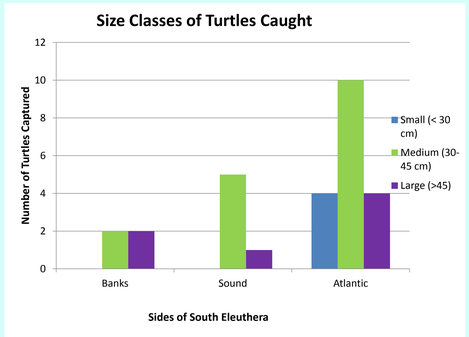

Figure 9: Represents the different size variations based on size class groups (Banks n=4, Sound n=6, Atlantic n=19).

Results

The results show that there is no significant difference in the curved carapace length between the 3 sides of South Eleuthera (p=0.4) (Figure mean5). Abundance measured by CPUE is significantly higher on the Atlantic side of South Eleuthera (p=0.008) (Figure 6). Figure 7 which represents the different size classes into which the turtles caught were grouped demonstrates greater size variation on the Atlantic side.

Discussion

Based on the results, the hypothesis was rejected for various reasons. Relating to abundance it was expected to find a higher amount of green sea turtles in the Exuma Sound and Atlantic sides, however the results show that only the Atlantic side had a significantly higher abundance of green sea turtles (Figure 7).

With regards to size, the study expected mean carapace length of the turtles caught to differ between the three sides of South Eleuthera, however the p-value of 0.4 demonstrates that there is no significant difference in green sea turtle mean size between the three studied sides (Figure 10).

It is interesting to point out however, that although the statistics show no significant difference in mean carapace length between the sides, a variation of size classes on the Atlantic side was witnessed, as shown in Figure 9.

Figure 10: The carapace of a green sea turtle

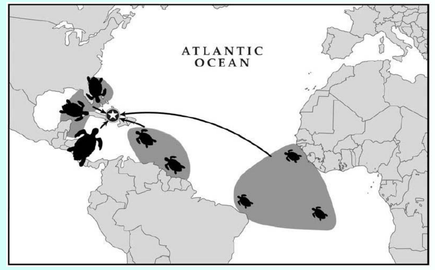

Figure 11: Turtle Migration Patterns in the Atlantic Ocean (Bolten & Bjorndal 2003)

Figure 12: Tamara holding a 15 cm juvenile green sea turtle

Figure 13: The Island School turtle research team 2012

Conclusion

Turtles return to their native beaches to nest (Figure 11). There is a higher likelihood of finding juvenile green sea turtles (Figure 12) in the Bahamas. This is due to the fact that after turtles nest in Central and South America, the currents carry them up to the Bahamas, especially the Atlantic side of Eleuthera; where they find viable foraging habitats, that allows them to grow, and then overcome the currents and return to their nesting beaches.

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