

Investigating the Size, Abundance, and Distribution of Green Sea Turtles in Half Sound, Eleuthera, The Bahamas

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Seven Species of Sea Turtles Worldwide

Loggerhead	<i>Caretta caretta</i> - Endangered
Flatback	<i>Natator depressus</i> - Data Deficient
Olive Ridley	<i>Lepidochelys olivacea</i> - Vulnerable
Kemp's Ridley	<i>Lepidochelys kempi</i> - Critically endangered

Species In The Bahamas

Green	<i>Chelonia mydas</i> - Endangered
Leatherback	<i>Dermochelys coriacea</i> - Critically Endangered
Hawksbill	<i>Eretmochelys imbricata</i> - Critically Endangered

Sea Turtles Going with the Flow

The migration of sea turtles occurs between the oceanic and neritic stage of a sea turtles life. Their movements are determined by the various currents of the global oceans. For example, the sea turtles in the Bahamas are carried there by the Gulf Stream along the west side of the Atlantic ocean.



Our Study

Location
Half Sound, Eleuthera (Fig. 1), is a shallow, protected bay about 3km in length with a high abundance of sea grass. It is located above Rock Sound on the Atlantic side of Eleuthera. We conducted our study here because a study by the previous semester found the abundance of sea turtles in Half Sound was high compared to other foraging grounds on Eleuthera. Thus, Half Sound is a highly populated foraging ground and a suitable place for our study.

Purpose
The purpose of our study is to investigate the abundance, size, and distribution of green sea turtles in Half Sound, Eleuthera

Methods

Spot, Catch, Release

On the boat, a team of spotters scans the water for sea turtles. When one is seen, spotters point at the turtle to guide the driver in the chase (Photo A). After the turtle slows down, one or two snorkelers swim after the turtle. The two snorkelers pursue the turtle and once one of them is close enough, the swimmers pick it up under the front flippers (Photo B). On the boat, we measure the turtle's carapace (Photo C) and weight (Photos D). We take a picture of it and check for abnormalities. Then we tag the turtle on its front flippers (Photo E), and then release back into Half Sound (Photo F).

Surveying Half Sound

The abundance of turtles in Half Sound is calculated by multiple conducted surveys. One member of the group stands on the front of the boat as the boat slowly drives around the perimeter of Half Sound (Photo G). Every time a turtle was seen, it was tallied and the location of the turtle was recorded.

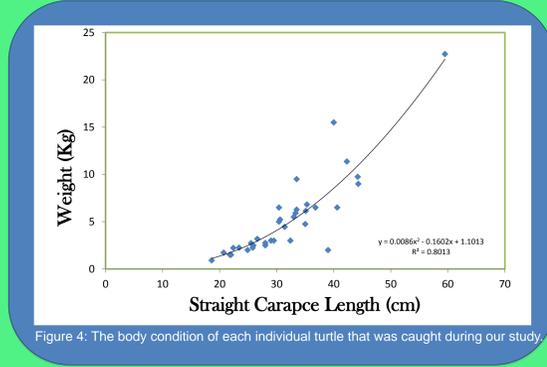
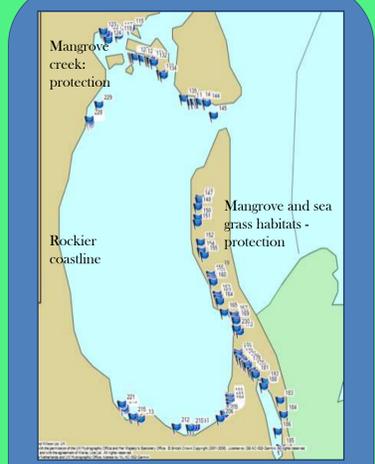
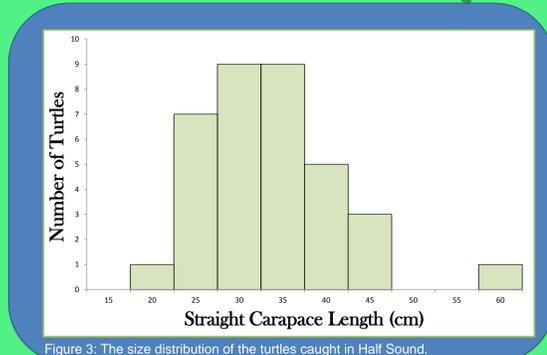
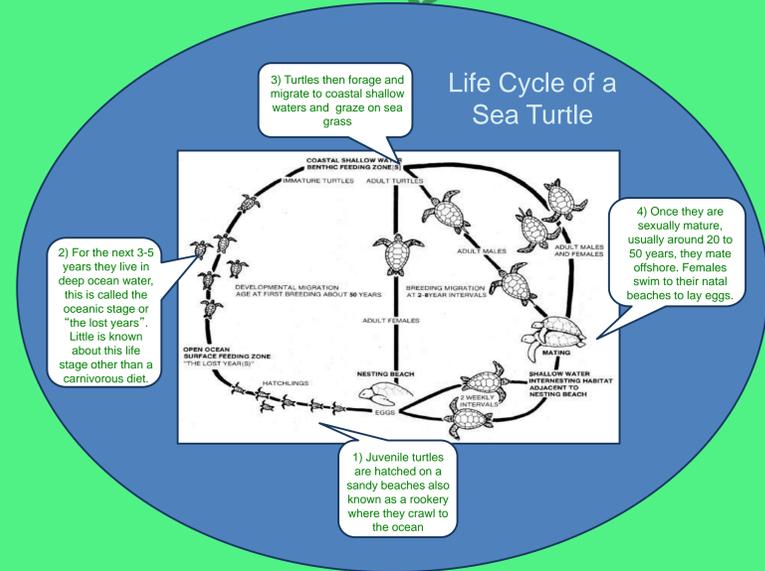
Results

Surveys Conducted in Half Sound

Over the course of our study, four surveys have been conducted in Half Sound. During our surveys, there were 76-116 turtle sightings. The mean was 97.75 (± SD 17.97) (Fig. 2). The large range in the number of sightings we took is due to poor weather conditions that affected our survey count. We spotted the majority of turtles on the east side of Half Sound and we believe this might be because the east side of Half Sound has a greater percentage of mangrove habitat and protected creeks than the west side which has a rockier coastline.

Size of Turtles in Half Sound

43 turtles and 2 recaptures have been caught in Half Sound. The mean straight carapace length of turtles that were caught in Half Sound is 31.8cm (± SD 8.29). The straight carapace length of green turtles caught ranges from 18.6 to 59.5. As you can see from this graph, the majority of turtles we caught in Half Sound fell in the 29cm to 39cm range (Fig.3). The average weight of turtles we caught was 5.25kg (± SD 0.65). The weight of turtles we caught ranges from 0.9kg to 22.7kg. The body condition graph (Fig. 4) shows the length and weight for each individual turtle caught.



Discussion

Important Foraging Grounds

From the size variation of turtles we caught we determined that there is a range of ages of turtles in Half Sound. Therefore, we can conclude that turtles stay to forage and grow in Half Sound throughout their juvenile and sub-adult stages. The body condition data also illustrates that Half Sound is a successful foraging ground for turtles. Future research can be conducted on how turtles use these foraging grounds. Through measuring sea grass abundance and investigating the distribution of turtles within in we can determine trends of where and how turtles feed. We can also compare turtle data to changes in habitat through measuring water depth and other habitats.

Movement in Foraging Grounds

We recaptured two turtles that we had tagged previously in the same area we had originally caught them in. We can presume that turtles exhibit site fidelity within their foraging grounds. However we do not have enough evidence to support this claim. Further research could provide a more definite conclusion on this topic.

Importance of Study

Our study is important because we were the first to study the population of sea turtles and their habitat use in Half Sound. One of the most important life stages of a turtle is when it is growing, developing, and maturing in foraging grounds. Turtles migrate from all around the Atlantic Ocean to forage in the Bahamas. Our study will contribute to a better understanding and conservation of these areas.

Global Threats to Sea Turtles

All 7 species are on the International Union For Conservation of Nature endangered species red list

- Fisheries Bycatch**
Turtles are accidentally caught in fishing gear. For example: long lines and stationary nets.
- Pollution**
Coastal development destroys ecosystems and habitats. Wastewater, and plastics harm turtles, for example sea turtles are unable to regurgitate plastic once it is digested.
- Climate Change**
Sea turtles exhibit temperature dependent sex determination. When the sand temperature is above 30 ° C turtle eggs are more likely to be female because of a biological change.
- Illegal Harvest**
Sea turtles are harvested for their meat, eggs, and shells. (Hamman, M. et al 2012).

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Acknowledgements

We would like to thank our advisors Marie and Annabelle for their clear, concise, insight throughout our entire project at the Cape Eleuthera Institute for the various resources they supplied during our study, and The Island School for the wonderful opportunity. We would like to thank Dr. Karen Bjorndal for coming out in the field helping us with our study and conducting the vast majority of research that guided us in our study.