

All the Eggs in One Basket: Conserving Too Few Sea Turtle Sites

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Current conservation assessments of endangered Caribbean sea turtles are too optimistic, according to Loren McClenachan and colleagues from the Scripps Institution of Oceanography.

McClenachan, Jeremy Jackson and Marah Newman agree that conservation efforts since the 1970's have dramatically helped increase green and hawksbill turtle populations that nest on protected beaches. However, they argue that dwindling turtle populations on many historically important nesting beaches are overlooked by conservation assessments that focus instead on the few large nesting sites that remain. The study, "Conservation implications of historic sea turtle nesting beach loss," appears in the August issue of *Frontiers in Ecology and the Environment*.

The researchers present the first maps of historical nesting populations

Hunted for hundreds of years for food and for decorative purposes, turtle populations were greatly reduced by people. Using trade records from 163 historic sources in four time periods in 20 Caribbean regions, McClenachan and colleagues mapped the historic nesting areas of green and hawksbill turtles, and used density descriptions and harvest data to categorize "major" and "minor" nesting sites.

Historically, large nesting populations existed throughout the Caribbean. The researchers estimated 59 nesting sites existed for the green turtles, and 55 sites existed for the hawksbill turtles. Based on their results, 20

percent of historic nesting sites have been lost entirely due to land development and turtle exploitation, and another 50 percent of the remaining sites have been reduced to dangerously low populations.

“The loss of even a single nesting site makes a permanent, irreversible dent in the sea turtle population,” says McClenachan.

The scientists estimate that today’s current population of 300,000 turtles once was as large as 6.5 million adult turtles in the Cayman Islands in the 17th Century, with close to 91 million green turtles living throughout the Caribbean during this same time period. For Hawksbill turtles, the researchers estimate the population has dwindled from 11 million to less than 30,000.

McClenachan and colleagues suggest that the loss of entire nesting sites and nesting populations has compounded the population drop for the turtles, and see the reestablishment of lost sites as “extremely unlikely.” Their data point to hunting destroying 24 nesting sites of the two species of turtles, which also severely thinned turtle populations at the remaining sites.

Impact on Ecosystems

Besides the loss of the turtles themselves, sea turtles were also ecosystem engineers in the Caribbean, shaping the environment in which they lived.

According to the researchers, “The ecological extinction of green turtles transformed an ecosystem with diverse species of seagrass dominated by large herbivores into a detritus-based ecosystem dominated by overgrown monocultures of one species of grass.”

Green turtles feed mostly on turtle grass, while hawksbill turtles prefer marine sponges.

“The decline in green turtles has led to a loss of productivity available to the animal food chain – including commercial reef fishes – reducing the protein-rich food available for the Caribbean people,” say the researchers.

When the hawksbill’s numbers were larger they ate more toxic sponges. Now however, the results suggest the turtles are eating more non-toxic sponges. According to observations gathered by McClenachan’s group, the toxicity of hawksbill turtle meat has decreased from the 17th through 20th century, most likely due the turtles eating fewer of the toxic sponges. The changing ratio of sponge species will ultimately affect the landscape of coral reefs.

The scientists say more protection is needed for the sea turtle nesting sites.

“Protecting more nesting beaches is not a politically or socially simple endeavor, but it is the only way to avoid the risk of putting all turtle eggs in a very few baskets.”

Source: Ecological Society of America

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