Tennessee Aquarium Researchers Create First Map of North American Turtle Communities

Scientists in Chattanooga have produced the first map of where turtles live in North America. This is an important first step to helping save endangered species, especially turtle hotspots like the Southeast United States.

Chattanooga, TN (PRWEB) September 15, 2017 -- When it comes to conserving a species, scientists first must know two things: Where they live and why they reside there. A first-of-its-kind study conducted by Tennessee Aquarium Conservation Institute scientists Dr. Josh Ennen and Sarah Sweat seeks to answer these fundamental questions regarding North America’s many turtle species.

The ground-breaking report was published in the latest issue of Herpetological Monographs. Working in collaboration with other North American experts, Ennen and Sweat mapped the geographic boundaries of all the turtle communities in North America — the ‘where?’ — and analyzed how modern and historical forces shaped these patterns — the ‘why?’

Many scientists research turtles at the level of individual species or single habitats, but this study represents the first attempt to consider them on the scale of the entire continent. The map divides North America into 16 biogeographic “provinces,” sprawling regions containing turtle species with similar or shared characteristics.

Looking at these reptiles in such a broad context, researchers determined that the provinces’ borders were defined by many forces, from modern environmental factors to ancient geologic processes.

“As scientists, we need to consider all of those factors to understand why turtles are threatened, in some cases,” Ennen says. “We produced some useful maps, and I think there are numerous conservation implications for this study, eventually.”

In some cases, researchers determined that the modern distribution of turtles is the product of geological events millions of years old. For example, the study found similar turtle species to those living in the Mississippi River on the western side of Crowley’s Ridge — more than 40 miles to the west. The similarity in these otherwise isolated populations can be explained as a kind of echo from a time when the Mississippi flowed along a more westward course, Ennen says.

“I thought that was pretty cool, that you could still see that,” he says.

The Southeastern United States is considered a hotspot of biodiversity by biologists, especially of turtles. Fully half of North American turtle species reside within a 500-mile radius of Chattanooga, Tenn., where the Tennessee Aquarium showcases the world’s largest collection of freshwater turtles.

Turtle species found in the lower reaches of the Mississippi River reside in a region defined by researchers as the Central Gulf Coastal Plain province. This area encompasses much of the southern half of the river’s drainage.

Aquarium guests can see Alligator Snapping Turtles and many map turtle species that reside in this area by visiting the Mississippi Delta Country exhibit, which represents — in miniaturized form — a habitat similar to
those found in the Central Gulf Coastal Plain province.

Nearly 60 percent of turtle species are threatened with extinction, making them the world’s most endangered group of vertebrates. One of the keys to protecting them and offsetting their collective decline is by helping conservationists to better understand where turtles live and the role they play in their habitats, Ennen says.

Armed with the findings of this study and future research for which it paves the way, scientists will be better equipped to decide where they should devote time and resources to protecting these ecologically important, imperiled animals.

“Turtles are underappreciated, but they play pivotal roles in many ecosystems, from seed dispersal to altering the environment around them,” Ennen says. “If we lose turtles, we potentially lose a vital function in those ecosystems. We can’t afford that.”
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