

Bog Turtles, Southern Style

by Bern W. Tryon



Photo by R. G. Tuck, Jr.

Anyone who has visited the Great Smoky Mountains on the North Carolina-Tennessee border or driven along the Blue Ridge Parkway in North Carolina and Virginia can appreciate the vast, rugged, natural beauty of the Southern Appalachians. It is also a region of outstanding biological diversity in which new scientific discoveries continue to be made. Fitting together the pieces of the ecological puzzle for any rare species can be a time consuming and often frustrating process, one sometimes compounded in these mountains by the rugged terrain and increasing development.

An example of these challenges is the case of the bog turtle (*Clemmys muhlenbergii*). The northern population of this elusive species, found at isolated sites scattered from New York and Massachusetts to Maryland, was listed in 1997 as threatened. The southern population, which is not considered by the Fish and Wildlife Service to be in danger of extinction, is listed as threatened due to its similarity of appearance to the northern bog turtle. In the south, bog turtles are restricted to small remnants of wetland habitat tucked away in the mountains and Piedmont of North and South Carolina, Virginia, Georgia, and Tennessee. Most of what is now known of the bog turtle in the south was brought to light only during the past several decades. For this species, zoo personnel and their associates have played an integral role in putting the pieces of the puzzle together.

Although the bog turtle was first found here in the 1880's, it wasn't until the early 1970's that surveys were initiated in North Carolina, now considered the stronghold for the species in the south. The Highlands Biological Station and the National Audubon

Society enlisted Robert T. Zappalorti, then of the Staten Island Zoo, to conduct a series of surveys in western North Carolina. Accompanying Zappalorti on some of these trips was Dave Collins, then of the Burnet Park Zoo in Syracuse, New York, and now Curator of Forests at the Tennessee Aquarium. Zappalorti, Collins, and their colleagues found a number of important turtle sites. Although some of these sites no longer exist, others have been used over the years to document problems for bog turtles such as vegetational succession in the habitat, bog destruction due to development, and turtle poaching. Zappalorti's 1975 book, *An Amateur Zoologist's Guide to Turtles and Crocodilians* (Stackpole Books), includes photos of bog turtles from some of these early surveys.

A name synonymous with bog turtles in North Carolina, and indeed throughout the species' southern range, is Dennis Herman, who for over two decades as a herpetologist at Zoo Atlanta established himself as not only the region's leading expert but also a champion for turtle and habitat protection. Herman picked up where Zappalorti left off, and in the years since then he and his associates have been responsible for documenting bog turtles in over half of the 20 North Carolina counties known to harbor the species. In 1995, in an effort to unify field studies within the State, Herman founded Project Bog Turtle, sponsored by the North Carolina Herpetological Society and the North Carolina State Museum of Natural Sciences, where he is now Curator of Living Collections. This important initiative has combined statewide efforts for the species, maintains a data base for bog turtles in the south, and has been instrumental in assisting the conservation efforts of

private landowners through easements, habitat maintenance, and education.

As part of Project Bog Turtle, Herman and his colleagues continue to play a large role in identifying new turtle sites throughout the species' southern range. In the early 1990's, Herman and I joined forces with George Amato and John Behler of the Wildlife Conservation Society/Bronx Zoo in a study of turtle genetics. In a 2-year period, we were able to collect blood samples from 64 bog turtles representing all 5 States in the southern range as well as samples from Maryland and Delaware. An examination of mitochondrial DNA showed no differentiation among populations, but additional analysis will soon be underway.

My own program had its start when Herman, along with Jim Warner (a bog turtle expert from Connecticut), discovered the first bog turtle in Tennessee in May 1986. We quickly identified the only two turtle sites in Tennessee known to date. The Tennessee project has not only encompassed 14 seasons of field work but a captive breeding element as well. In late 1986, a large, naturalistic outdoor bog exhibit was constructed at the Knoxville Zoo, providing an attractive facility for environmental education and for raising bog turtles. (The American Zoo and Aquarium Association awarded the Knoxville Zoo its Significant Achievement Award for this exhibit in 1989.) The Knoxville Zoo's captive breeding program has produced 103 bog turtles since 1988. Working with the Tennessee Wildlife Resources Agency (TWRA), the zoo developed a head-start/release program. Since 1991, 84 captive-bred turtles have been released into a large site in a neighboring county.

In any wildlife endeavor, the value of partnerships cannot be underestimated. Here in Tennessee, the Knoxville Zoo, TWRA, The Nature Conservancy of Tennessee (TNC), and the U.S. Fish and Wildlife Service (with support and funding from Asheville, North Carolina, Field Office through the

Partners for Fish and Wildlife Program) have joined forces to establish the bog turtle as a flagship species for a rapidly disappearing wetland ecosystem. Only three percent of the State's naturally occurring wetlands are found in eastern Tennessee and a tiny fraction of this includes bog turtle habitat. Through the combined efforts of these organizations, especially TNC, a 65-acre (26-hectare) habitat restoration project now underway in rural Tennessee may help to provide a bright future for bog turtles in this State.



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