

In 1974, John O. Fussell III conducted a survey of the Natural Communities of the Roosevelt Natural Area surrounding the aquarium. The research included surveys of vascular plants, birds, reptiles, amphibians and mammals, as well as vegetation mapping. In his report Mr. Fussell also identified both rare and invasive species within the Natural Area. He did further work *A Description of Vegetative Communities and Annotated Lists of Amphibians, Reptiles, Birds, Mammals, and Endangered and Threatened Species of Bogue Banks* in 1978.

The current proposed conservation grant will be a follow-on study that builds on earlier work and will document changes within the habitats, vascular plant and bird presence as well as sitings of rare and invasive species. This will be an especially valuable study because it will be conducted by the original researcher with intimate knowledge of the land and habitats and flora and fauna of the site. Mr. Fussell will be able to make direct observations of how the biodiversity of the Theodore Roosevelt Natural Area has changed using the same parameters as previous study with added use of GPS.

Work within the Teddy Roosevelt Natural Area would include:

- 1) Conduct Bird Surveys
- 2) Map Vegetation
- 3) Update list of vascular plants
- 4) Identify and Map Rare Vascular Plant Populations
- 5) Identify and Map Invasive Species
- 6) Conduct Reptile and Amphibian Surveys
- 7) Update List of Reptiles and Amphibians
- 8) Identify and Map Rare Reptiles and Amphibians Populations
- 9) Identify and Map Invasive Reptiles and Amphibians Species

The Aquarium footprint and Theodore Roosevelt Natural Area provide habitat for many native species. This survey will highlight changes in habitats and species that have occurred over 40 years including species of conservation interest.

Trends and findings from this research can help guide management of the area and species therein. Findings will be available to the public and willingly shared with universities and conservation organizations. The superintendent of Fort Macon State Park (manages the area) is aware of and supportive of this project, and will be able to use the data gathered to inform his management plans. The survey will serve as a base layer of information upon which other research can be overlaid. Possible future study objectives could include observing changes and presence of various species within groups such as mammals, insects, and nonvascular plants; fresh water pond inhabitants and water studies, shoreline changes, etc. Other work building on this base study could inventory and map species of fish, crustaceans, mollusks, and/or water plants found in marsh and Sound that could grow to include quantitative studies throughout year and changing conditions. A potential study of the presence or absence of amphibian Chytrid fungus in native amphibian populations, would be especially valuable.

The Natural Area serves as a biodiversity refuge on a barrier island, and thus represents an important habitat for native coastal species. Documenting how native species utilization of this area has changed provides valuable insight into how such land conservation can contribute to

conservation of unique plant and animal communities. This project will expand our understanding of how invasive species, land development along the Natural Area margins, and environmental changes may impact population trends.

The NC Aquarium at Pine Knoll Shores is interested in supporting this research for the following reasons:

- The Aquarium plays a role in providing and preserving the habitats within the Theodore Roosevelt Natural Area.
- Some of the species within the Aquarium's collection are also found under this study of our local habitat – hawks, owls, pelicans, amphibians, snakes and alligators. For example, alligators were once found within the Roosevelt Natural Area. Perhaps there is evidence of their return, and this study will help us to find out. This habitat is representative of barrier island ecosystems which are a unique and critical habitat represented in all the NCAs.
- The Aquarium researches ways to improve techniques to house, breed, raise and release animals and can ultimately reduce animal loss and wild capture, and support diminishing wild populations. By understanding local habitats and the variety of factors that impact them, aquarium staff can use results of this study to educate guests and students, and enable us to act locally.
- This research would lead to important stories (species of conservation significance, changes in groups, impact of community structure, shoreline location etc.,) that could be used to educate the public through interpretive graphics, presentations, workshops, etc.
- Spreading the word of this research and its findings may increase use and public support of the Roosevelt Natural Area and its trails.
- Potentially lead to citizen science participation in projects.

Google Maps depicting the study area.

