



Faculty Forum



You Cannot Conceive The Many Without The One
-Plato-

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HOW A NATURALIST FINDS HIS WAY TO THE UNIVERSITY CLASSROOM

By

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I have been passionate about nature for as long as I can remember, partly inherited from my parents who love the outdoors and partly from a fascination with all things that creep and crawl. At an early age I was exploring the fields and forests surrounding my parent's home in Beech Island and dragging in all sorts of scaly and slimy creatures. When I was able to drive, I expanded my explorations and knowledge of local flora and fauna on numerous trips to the swamps of the Savannah and Edisto Rivers. At an early age, I knew that I wanted to have a career in the life sciences, specifically I wanted to be a herpetologist, a scientist that studies reptiles and amphibians. Eventually, when my interest expanded to include birds, fishes, and vascular plants, I realized that I had become a naturalist.

I was fascinated with how organisms interacted with their environment and with the diversity of habitats that supported such flora and fauna. Through this, I became aware that some species were scarcer than others and that human and natural disturbance had a significant effect on wildlife habitat. Because a number of imperiled species exist on our planet, much effort has been placed on the conservation of these species and their respective habitats. In South Carolina alone, 249 species of mammals, birds, reptiles, amphibians, and fishes designated as "priority species" are in need of conservation (SCDNR 2005). I wanted to better understand how anthropogenic and natural disturbance changed these habitats and how changes in habitat could be correlated to shifts in the faunal community.

Wildlife research involves very physically challenging work in some of the most extreme conditions that Mother Nature can deliver. Field research requires continuous hours of close contact with coworkers; but, there is also an accompanying element of adventure and camaraderie in field biology. The ability to interact and communicate in a positive way is the foundation for sound data collection and maintaining sanity.

My official career in science as a research technician began at the University of South Carolina Aiken. I worked with

several other students to collect data for a study that monitored the restoration of the herpetofauna community in Pen Branch, a once thermally polluted blackwater stream on the Savannah River Site (SRS). The Savannah River Site covers over 300 square miles and supports a variety of relatively undisturbed terrestrial and aquatic habitats (Gibbons et al. 1997).

Pen Branch was and still is a very wild place that forms a large delta before entering the extensive swamps of the Savannah River. Field researchers usually worked alone, miles from the nearest paved road much less the nearest hospital. Despite the conditions and isolation, we managed to capture cottonmouths and alligators and tolerate the hordes of biting insects to escape relatively unharmed. After completing required duties, we often had time to explore other swamps, Carolina bays, and isolated wetlands scattered across the southwest portion of SRS.

Over a dozen different types of wetland ecosystems can be found in the Coastal Plain of South Carolina, which is fortunate to have everything from extensive swamp forests to Carolina bays—elliptical shaped lakes of questionable origin—occurring along the eastern Coastal Plain (Mitsch and Gosselink 1993). Some of these wetlands are characterized by a specific suite of species with unique conditions provided only within the confines of their niche.

In graduate school, I was involved in a study that investigated the diversity of herpetofauna in Piedmont isolated wetlands. The McCormick County study was initially set up as a species inventory but it blossomed into a study that allowed the comparison of herpetofauna and small mammal communities in three different habitat types. One of these habitat types included isolated

wetlands, which are uncommon features on the Piedmont landscape. Isolated wetlands provided important breeding habitat for a number of amphibian species, particularly three species of mole salamanders and the four-toed salamander. The occurrence of one particular species in McCormick County was noteworthy and provided one of the few recent records for salamanders in the Piedmont (Kilpatrick 2001).

South Carolina's diversity of wetland habitats is mirrored by a number of terrestrial ecosystems. Fire, whether of natural or anthropogenic origin, have shaped these ecosystems for millennia. The regiment of periodical burning over time resulted in a number of fire dependent species of plants and animals. Unfortunately, many of these species have been extirpated due to over a century of fire suppression. Restoring fire dependent ecosystems has been an ongoing goal of local, state, and federal agencies for over 30 years and has involved techniques such as prescribed fire and forest thinning. My graduate career was spent conducting research on a federally funded study geared toward restoring fire dependent ecosystems in the South Carolina Piedmont.

The southeastern Piedmont portion of the Fire and Fire Surrogate Study (FFS) was initiated in the Clemson Experimental Forest (CEF) in spring 2000 to study the ecological and economical consequences of four fuel reduction treatments. The FFS is a national study installed at 13 sites across the United States with the objective of using prescribed fire and thinning to understand how vegetation, fuel and fire behavior, soils, wildlife, pathology, and treatment cost and utilization economics are affected by fuel reduction treatments. As with most wildlife studies, we experienced setbacks

such as southern pine beetle infestations, prolonged droughts, and delays in treatment implementation that introduced their share of variation into the dataset. But after almost two years of intense focus on the effects of prescribed burning and thinning on herpetofauna, preliminary results showed few significant treatment effects on abundance for any of the major groups of reptiles and amphibians sampled during the study (Kilpatrick 2002).

During my work on the Clemson Experimental Forest, I was also asked to conduct a regional analysis of herpetofauna across three other southeastern FFS sites. This research increased my knowledge of complex statistics and served to detect trends in herpetofauna that could influence forest management decisions at the national level. A naturalist that understands statistics, experimental design, and data analysis can attempt to understand how flora and fauna interact as a collective unit with their physical environment.

Another aspect of my research on the FFS focused on the responses of vertebrate fauna to fuel reduction treatments in the southern Piedmont. I continued monitoring herpetofauna and added a bird and small mammal component. Correlation and prediction methods were used to show how vertebrate communities in the Piedmont would respond to changes in vegetation and forest structure. Resident and migratory birds exhibited a notable response to prescribed burning and thinning. Species such as the indigo bunting, prairie warbler, and yellow-breasted chat were most abundant in plots that had been thinned and burned. These species, some with high conservation priority, migrate from Central and South America to breed in the eastern United States, therefore, introducing prescribed

burning and thinning in the southern Piedmont creates habitat conditions that are essential for the conservation of resident and migratory bird species that rely on early successional shrub/scrub habitat.

Thinning and prescribed burning that create gaps in the forest canopy can increase the abundance of small mammals, which are important in forest stands not only as ecological consumers but as prey items for a number of bird, reptile, and mammal species. Older stands composed of large diameter trees provide habitat for mesic snake species. Managers should maintain a component of sawtimber-sized trees in southern Piedmont forests to provide habitat for these species. Prescribed burning and thinning can mimic historical disturbance regimes in southeastern forests where southeastern flora and fauna have evolved. Many species of wildlife in southeastern forests with historical disturbance regimes benefit from the open conditions created from prescribed burning and thinning (Kilpatrick 2006).

The past ten years of research, teaching, and learning have resulted in a feeling of accomplishment and a strong desire to continue on this path. What is most exciting is that I am part of a region and culture that is close to my heart where I convey my passion for nature to my students, colleagues, and the public. The opportunities I have experienced as a naturalist and the desire learn and share knowledge have provided a foundation for life as a university academic.

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Eran S. Kilpatrick grew up in Beech Island, South Carolina, and attended the University of South Carolina Aiken where he received his B.S. in Biology in 1999. He received his M.S. in forest resources in 2002 and Ph.D. in forest and natural resources in 2006, both from Clemson University. Dr. Kilpatrick's research expertise and interests relate to the response of reptiles, amphibians, birds, small mammals, and vascular plants to forest management practices including prescribed burning and other fuel reduction treatments. Dr. Kilpatrick has been an assistant professor of biology at the University of South Carolina Salkehatchie since 2006 where he teaches Biological Principles (I and II) and Microbiology. He lives in Walterboro with his wife, Amy, and their children, Grant and Lily.



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