ECOLOGY OF ROCK OUTCROP COMMUNITIES

Highlands Biological Station, June 15 – June 27 2009

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COURSE OVERVIEW

Granite outcrop communities represent a very small fraction of land surface area in the southeastern United States (approximately 12,000 acres total) but contain a disproportionately large number of endemic plant species and unique community types. Exposed granite bedrock weathers in characteristic patterns and provides a number of unique habitats. Along the fall line in Georgia and the Carolinas, there are many flatrock communities where *Diamorpha (Sedum) smallii* and other endemics grow in shallow depressions on the rock surface. Also, in the piedmont, there are isolated granite domes such as Stone Mountain, Georgia which support a distinct flora. Less well studied, but biologically more interesting, are high altitude granite outcrops such as Whiteside and Rocky Face Mountains near Highlands, NC. The Highlands region is particularly rich in accessible and diverse high altitude rock outcrop communities. The exposed rock surfaces are characterized by exfoliation where thick slabs of granite break away and slide down the mountain, creating a patchwork of disturbance and primary successional habitats. In addition to exposing bare rock surfaces, exfoliation results in crevices and talus and weathering results in shallow depressions that accumulate soil. These heterogeneous habitats are extremely harsh compared to adjacent forested areas. They may fluctuate from saturated to xeric, or very hot to cold, in a matter of days or centimeters.

Granite outcrop communities offer many opportunities to examine a number of basic ecological and evolutionary processes, in addition to processes unique to outcrop communities. The goal of this course is to investigate patterns of biodiversity and ecological interactions with the biotic and abiotic environment of rock outcrop communities. Particular focus will be paid to the distribution and abundance of endemic and near endemic species, adaptations to severe conditions on outcrops, the processes of primary and cyclical succession, outcrop community assembly and its relation to the theory of island biogeography. A series of trips to local outcrop habitats to collect data on ecological processes and diversity patterns will be combined with lectures, laboratory exercises and discussions of the literature. Each student will conduct an independent research project. In addition, one overnight field trip is planned to visit Stone Mountain, Georgia and nearby flatrock communities in order to contrast their flora and ecology with high altitude outcrop communities near Highlands. Students will gain a better understanding of the diversity, ecology and conservation significance of southeastern outcrop communities.