Developing Adaptive Management Strategies for Ecosystems in Transition: Year 3 Project Report

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Summary: Harvesting of the research plots began in August 2010. One research block was harvested before wet conditions halted operations, and is expected to resume in June 2010. Other research studies, not dependent on the harvesting, were initiated in 2010. This includes the development of a modeling study which will use the U.S. Forest Service’s Forest Vegetation Simulator to simulate the cutting treatments that will be applied at Tate’s Hell State Forest. The model will evaluate forest structure and productivity over repeated cutting cycles. A study regarding seed bank dynamics and potential groundcover responses following harvesting was designed and will be carried out in 2011.

Full Report Project Activities 2010: Initial harvesting of the research plots began in August 2010, however logging operation were stopped after only one of the three research blocks was harvested due to wet conditions. Subsequently, the harvesting contract was cancelled in September, 2010 by DOF Forest Management Bureau due to violation of contract. In January-February 2011, a new contract was awarded to Longleaf Timber, a timber buying firm from Crawfordville. The timber sale which was earlier named Gator Timber Sale has been renamed Caiman Timber Sale. The efforts are to resume harvest on
CFEOR stands as soon as possible contingent upon suitable environmental conditions. It is highly probable the harvest will resume in June 2011.

The pre-harvest vegetation sampling and canopy mapping using Digital Hemispherical Photography had been completed by late summer 2010. Additional canopy mapping was implemented in other study sites (Blackwater River State Forest and Goethe State Forest) with similar cutting treatments as those being implemented at Tate’s Hell. We studied how these different uneven-aged management strategies affect understory light regimes in these ecosystems. The study revealed canopy light transmittance and understory light availability differs with respect to management practices, species (longleaf vs. slash pine), as well as proportional species composition in mixed stands. A draft manuscript was completed in 2010 and will be submitted for publication in the coming year.

Ajay Sharma, the doctoral candidate working on this project, participated in a week-long training program in the application of Forest Vegetation Simulator (FVS) conducted by USDA Forest Service, Southern Research Station, at Asheville, NC. A detailed plan of using FVS model to test different harvest regime to convert the even-aged slash pine stands to uneven-aged stands has been developed. The proposal was presented to the CFEOR members at CFEOR annual meeting held in Tallahassee, FL, on March 18, 2011. It outlined all the scenarios to be simulated which represented all feasible combinations of harvest treatments, residual basal area, cutting cycles, and regeneration. The output from the simulation modeling will include the results of the simulations (e.g. measures of tree size and growth, forest structural diversity) as well as visual depictions of the changes in forest structure using SVS (an application associated with the simulator). In addition, the results will be used to develop a flow chart or other tool which will allow an end-user to determine the best scenario (e.g. cutting treatment, cycle or intensity) to meet specific objectives.

The research findings on light regimes in uneven-aged stands using Digital Hemispherical Photography were presented at annual meeting of Ecological Society of America (ESA) held in Pittsburgh, PA, in August, 2010. The research presentation received awards from the ESA- Strategic Environmental Research and Development Program (ESA-SERDP) of U.S. Department of Defense and the ESA-Student Section. Another research presentation will be made at the 4th National Conference on Ecosystem Restoration at Baltimore, MD, in August, 2011.