A WORKING LABORATORY AT THE POWELL RIVER PROJECT TO RESEARCH AND PROMOTE SUSTAINABLE FOREST MANAGEMENT

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Introduction

Virginia Cooperative Extension and Virginia Tech's Department of Forestry are working to take the next step in coalfield reclamation by researching and demonstrating sustainable forest management in natural and planted forests at the Powell River Project. The purpose is to establish research and education programs related to the management of forested ecosystems on Appalachian mining lands. Initial objectives include rehabilitating degraded natural forests and demonstrating outcomes to landowners, practitioners, and youth via Extension programs. Other aims are to research effective thinning and regeneration treatments in highly variable reclamation stands and develop a systematic approach for collectively managing rehabilitated natural and planted stands. During the summer of 2008, a field technician established a permanent inventory system consisting of comprehensive timber, tree regeneration, downed woody debris, and herbaceous measurements on about 200 acres of natural forests at the Powell River Project.

Background

Coal mining is a tradition in the mountains of deep Southwestern Virginia. Yet forestry and natural resources management are also a critical part of the region's character and economy. Over the past 25 years, scientists have been working with the mining community to develop effective methods for re-establishing forests on formerly mined lands. The Powell River Project has played a key role in hosting research to support this effort. Now, partners are working to take the next step in forest management on coalfields by researching and demonstrating sustainable forest management in the Powell River Project's natural and planted forests.

An outdoor sustainable forest management classroom at the Powell River Project Research and Education Center will offer research and education programs related to managing forested ecosystems on mining lands. Initial objectives include rehabilitating degraded natural forests and demonstrating the benefits to landowners, practitioners, and youth. Other aims are to explore the opportunities for managing forests planted after mining operations, develop a systematic approach for managing both natural and planted forests, and track changes using periodic field inventory.

Methods

Four compartments (A, B, C, and D) were defined based on geography and topography; each compartment spans a ridge line, drain-way to drain-way (Figure 1). Grid systems housing 1/10th

acre permanent over-story plots, mil-acre regeneration plots, and woody debris transects were established in each compartment. Stems one inch in diameter at breast height (dbh) and greater were inventoried. Dbh, basal area, live crown ratio and crown positions (suppressed, co dominant and dominant) were recorded. Merchantability was determined for each tree and a grade of acceptable or unacceptable growing stock was given based on species, bole shape, crown position and tree damage. Number of bolts (8 ft long) or logs (16 ft long) contained in each acceptable stem were recorded. Four regeneration plots were randomly established on the outer boundary of each over-story plot and used to measure understory seedling, herbaceous plants, and depth of litter layer. Lastly, downed woody debris were measured using random transects.

The entire inventory system was mapped using a Global Positioning System and entered into a Geographic Information System. Data collected at each plot will be used to identify management prescriptions and inform research design.

A 12-acre prescribed burn occurred in compartment A in April 2008. Prescribed burning targeted invasive species and sought to enhance desirable regeneration with the ultimate goal of preparing for restorative harvesting at a later point in time. Research plots were established in the burned comparment (compartment A) to assess impacts on invasive vigor and compare herbaceous cover and tree regeneration with like data from an unburned control compartment (compartment B).

Progress

During the summer of 2008, more than 60 permanent plots were established to collect baseline data on about 200 acres. Data will be analyzed in the fall of 2008 and used to guide future management prescriptions and Extension programming. It will also allow educators and researchers to assess progress in terms of the biological, economic, and social benefits of sustainable forest management. More specifically, data collected from compartment A (burned compartment) and B (control compartment) will be analyzed as part of an undergraduate research project in the Department of Forestry at Virginia Tech. Follow-on work will consist of inventory in additional acreage, periodic re-inventory of established plots, photographic documentation, controlled burning in adjacent compartments (C and D), restorative timber harvesting where warranted, annual educational conferences, and the establishment of additional partnerships to support additional research and demonstration.

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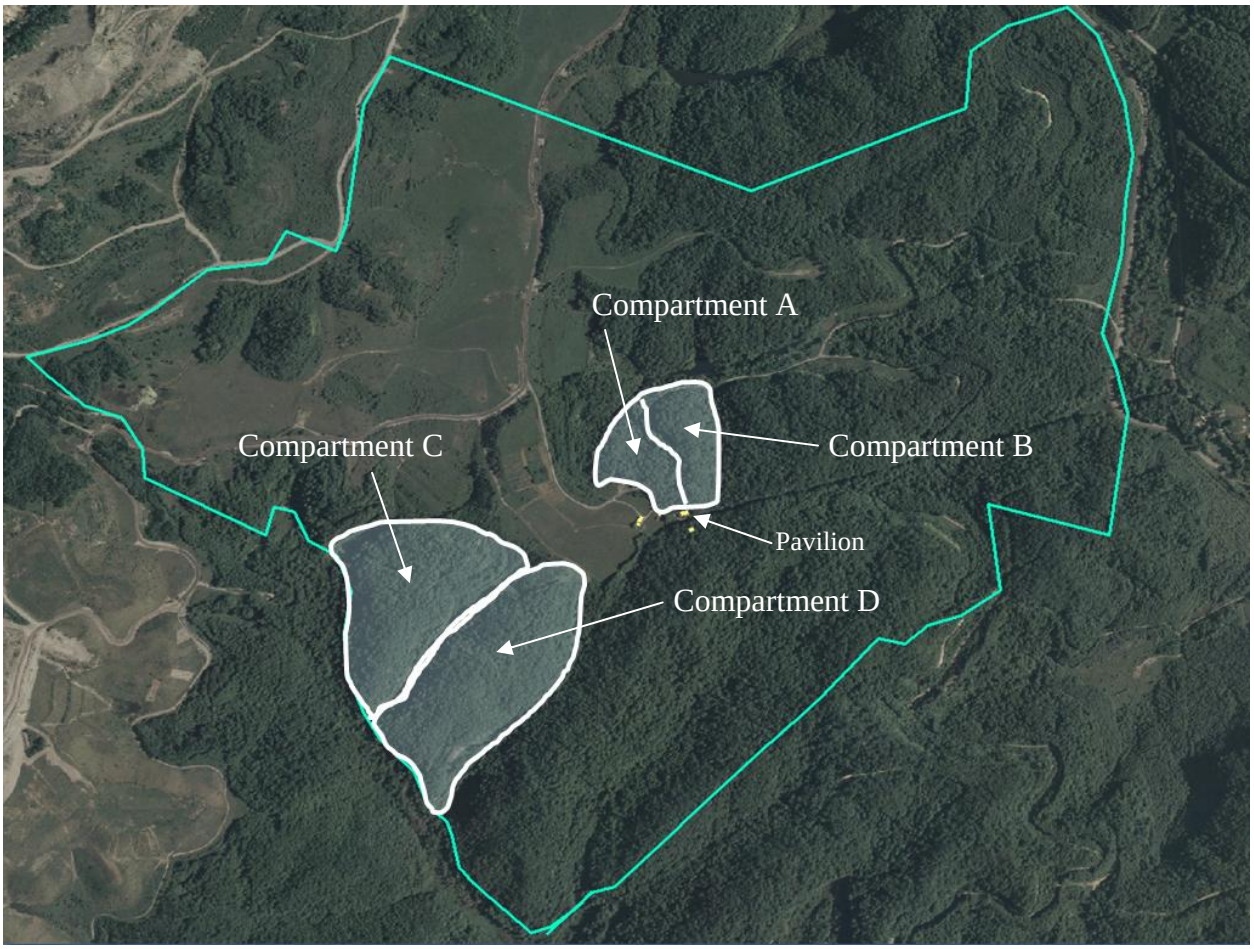

Figure 1. Four compartments at the Powell River Project inventoried during the summer of 2008.