Appendix B: Research Work Unit Descriptions

SRS-4353 – Center for Forest Watershed Research
Otto, NC; Blacksburg, VA; Charleston and New Ellenton, SC
Project Leader: James M. Vose

Mission: To evaluate, explain, and predict how water, soil, forest, and aquatic resources respond to ecosystem management practices, natural disturbances, and the atmospheric environment; and to identify practices that restore, protect, and enhance watershed health.

Problem 1. To develop a fundamental understanding of the structure, function, and interactions among terrestrial, riparian, and aquatic components of forested upland and wetland watersheds.

Watershed health is a critical issue facing land managers in the southeastern U.S. Changes in historical and contemporary disturbance regimes, invasive species, climatic extremes, and human population growth and resultant land use change are putting considerable stresses on upland, wetland, and aquatic ecosystems from the mountains to the coast. Fundamental knowledge on ecosystem structure and function will be required to restore, enhance, or maintain healthy watersheds across the southeastern landscape.

Problem 1a. Understanding biotic and abiotic ecosystem processes.
The unit will develop a detailed understanding of biotic and abiotic ecosystem processes in upland and wetland forest watersheds and their interaction with silvicultural practices.

Problem 1b. Landscape level analyses.
The unit will develop landscape level analyses techniques that incorporate new approaches in modeling, scaling, and uncertainty analyses to incorporate science, land use, policy options, and regulations into assessments of landscape function and productivity, and to design landscapes to accomplish specific functions and deliver specific outputs.

Problem 1c. Fish distribution, abundance, and resilience.
The unit will determine how the distribution, abundance, and resilience of fish and other aquatic organisms in the southern Appalachians are influenced by natural and human factors.

Problem 2. To develop knowledge, methods and guidelines to evaluate the effects of natural resource management on forested upland and wetland watersheds.

The magnitude and diversity of human needs and expectations from southeastern ecosystems have increased sharply in recent years and are expected to accelerate even more in the future. As forest management activities intensify and diversify to include restoration of watershed health, there is a critical need to evaluate the ecological consequences of alternative practices from an ecosystem perspective and at large spatial scales.

Problem 2a. Sustain and restore aquatic communities.
The unit will develop and test techniques to sustain and restore aquatic communities and the aquatic and streamside habitats on which they depend.

Problem 2b. Ecosystem restoration and health.
The unit will develop new or improved technologies, reference system models, and reliable indictors of restoration success and ecosystem health for forested upland, wetland, and riparian ecosystems.

Problem 2c. Linkage between ecohyhydological processes and management practices.
The unit will develop a detailed understanding of the functional linkages between ecohydrological processes in forested upland and wetland landscapes and management practices required for water quality improvement, quantity control, and productivity.

Problem 3. Long-term hydrologic and ecological research on forested upland and wetland watersheds.

Problem 3a. There is a continuous need for long-term data collection, maintenance, and analyses.
The unit will continue long-term monitoring of gauged watersheds, climate stations, permanent plots, and experiments. Studies will continue on both high and low gradient hydrologic systems. These data provide the cornerstone of the Center for Forest Watershed Research program and underpin the RWU's mission.

Environmental considerations: Proposed research activities under each of the problem areas outlined in this Research Work Unit Description are limited in context and intensity and are not expected to have a significant effect on the quality of the human environment. The environmental effects of specific actions will be considered during the development of study plans, as well as the existence of extraordinary circumstances related to any proposed action, and categorical exclusion will be documented as a part of the study plan according to FSH 1909.15, Chapter 30. Where environmental concerns exist regarding particular studies, these may be evaluated within individual study plans, or by Environmental Assessments or Environmental Impact Statements prepared with and reviewed by the cooperating District or Forest staffs.

Key Partners:

University of Georgia
University of Minnesota
University of New Hampshire
University of North Carolina-Chapel Hill
University of North Carolina-Asheville
Duke University
College of Charleston
Clemson University
Virginia Tech
Furman University
Western Carolina University
North Carolina State University
US Environmental Protection Agency
USDA Forest Service, National Forests in NC, GA, TN, VA, SC
National Science Foundation
USDA Natural Resources Conservation Service
Jones Ecological Research Center
The Nature Conservancy
Oak Ridge National Laboratory
Southern Group of State Foresters
USDA Forest Service, State & Private Forestry