

Past and Present uses of Robinson Forest

Robinson Forest is a teaching, research, and extension forest administered by the Department of Forestry at the University of Kentucky. Its 14,786 acres are located in the rugged eastern portion of the Cumberland Plateau. Robinson Forest is part of the Mixed Mesophytic Forest, the most diverse forest region found in temperate North America. From the top of the fire tower, one can see that Robinson Forest has been isolated due to human activities such as surface mining of coal. Today, Robinson Forest contains some of the least disturbed watersheds in eastern Kentucky. It is also a source of valuable information about forestry, forest hydrology, wildlife, and ecological relationships. More than that, it is a unique place where research and applied resource management come together through extension and teaching activities.

Extension Activities in Robinson Forest

Demonstration sites and materials have been developed specifically for use in extension programming helping educators to more effectively teach about water quality, forestry practices, wildlife, and forest resource management. These sites and their associated materials have been used by a broad range of groups, including high school and vocational educators, natural resource professionals, and environmentally concerned organizations.

Research at Robinson Forest

Research projects spanning a broad range of forestry and natural resource disciplines, including forest hydrology, silviculture, ecology, and wildlife are being conducted at Robinson Forest. Many research sites, as well as information generated from these studies, are available for use by groups. Please see the map for locations and descriptions of selected research projects.

Teaching at Robinson Forest

Students of the University of Kentucky's forestry and natural resource program attend summer camp at Robinson Forest each year to learn field techniques in dendrology, ecology, and forest sampling, silviculture, timber harvesting and utilization, wildlife management, and soil and water conservation. Throughout the year, various classes use the forest for field trips to learn about ecology, entomology, watershed, management, and plant identification. Robinson Forest, along with the Wood Utilization Center located nearby at Quicksand, KY, has also been used for technical programs for Forest and Wood Technicians.

A Brief History of the Use of Robinson Forest

Native Americans were the first humans to use the area in and around Robinson Forest. Arrowheads and chips of stone called chert have been found near sheltered rock outcrops from which the stone was excavated and used to fashion weapons. Little other direct evidence of native American presence remains, although they may have cleared small patches of land to grow native vegetables. This would have impacted the forest by changing its composition.

European settlers first came to the area in the early 1800's. These settlers had better tools than their Native American predecessors, and left unmistakable evidence of their occupation. They built houses and cleared land for agriculture. They raised livestock and grew crops such as corn, peas, beans, potatoes, pumpkins, squash, flax, molasses, and tobacco, mostly for home use. In the late 1800's, they began to engage in land speculation and logging of the virgin timber. Mills were set up, railroads built, and temporary villages sprang up to house the workers.

By the early 1920's, much of the valuable timber had been harvested. The majority of the forest was transferred to the University of Kentucky in 1923 as an agricultural experiment station. By 1925, the settlers and workers had moved from the forest. A concentrated effort was made to remove structures which they had left behind, and forest regeneration began to occur in cut areas. The first forester, C.H. Burrage, spent time establishing boundaries, making maps organizing fire protection, and conducting an inventory of the forest land. The volume of timber in the forest is now approximately four times as great as it was in Burrage's 1929 estimate, but still only half of the pre-settlement volume.

Between 1933 and 1937, the Civilian Conservation Corps was involved in projects such as building bridges, fire towers, and firebreaks; establishing tree plantations and doing timber stand improvements; improving roads; and installing phone lines. They removed American chestnut trees which had been killed by the chestnut blight. In 1939, the National Youth Authority used these logs to begin building the cabins at the forestry camp facilities on Boardinghouse Branch. A Wildlife Restoration Area was established in part of the forest in 1947, and white-tailed deer, wild turkey, and ruffed grouse were successfully stocked. An attempt to release beaver in the forest was not successful.

A two year association program in forestry was begun nearby at Quicksand in the summer of 1964. In 1970, the Department of Forestry was created at the University of Kentucky's College of Agriculture, and a new emphasis was placed on research in forestry and water quality. Many of the teaching areas that now exist in Robinson Forest are results of these studies. Currently, the forest is actively being developed as a teaching, research, and extension facility.

Use of Robinson Forest

Day-hikers in Robinson Forest may be especially interested in the Boardinghouse Interpretive Trail which leads up to the fire tower and can be accessed free of charge. Because Robinson Forest is a state Wildlife Management Area, foot travel throughout the remainder of the forest requires the purchase of a \$10 user permit from the Kentucky Department of Fish and Wildlife Resources. Please park near the front entrance as motor vehicle travel in the forest is restricted.

Groups interested in using Robinson Forest for programs related to forestry and natural resources are welcomed year-round. Group facilities, able to handle the feeding and housing of 50 people, are available on a first-come, first-served basis. Groups must provide their own sheets, towels, soap, etc. Participants should come equipped with clothing suitable for walking in the woods, i.e. sturdy shoes and seasonal gear such as raincoats or boots. Small groups must make their own eating arrangements. For larger groups, it may be possible to arrange for meals to be served. Depending on availability, group needs for access to teaching classrooms, and demonstration and

research areas will be accommodated. If your group is interested in using Robinson Forest, please contact:

711 Clemons Fork Road
Clayhole, KY 41317
Tel. (606)666-5034

Maps of the following sites are available from the Department of Forestry

Clemons Fork

- 1. Christmas Tree Plantation** - Established in 1991 using two popular Christmas tree species, Scots pine and eastern white pine. Management demonstrations of cultural practices include weed control, deer exclusion, pesticide use, and shearing (cutting shoots to produce a well-shaped tree).
- 2. Shiitake Mushroom Demonstration**-Demonstrates an alternate use of forest resources. Small hardwood logs or bolts can be valuable if used to support the growth of valuable shiitake mushrooms. Trees shading the site help keep it moist and cool for the mushrooms which will be produced for up for 5 years from inoculated logs.
- 3. Pine Thinning and Pruning** - A series of thinnings and prunings accomplished by removal of lower branches and competing trees. The remaining pines are able to grow straight, producing clear timber.
- 4. Crop Tree Release** - This study was initiated in 1983 to develop silvicultural strategies to enhance the value of white oaks. Ten year results showed that the thinnings increased crop-tree value and growth while encouraging the development of a mullet-aged forest. **4a** is study site containing 20 crop trees per acre and **4b** retained 365 crop trees per acre.
- 5. Old Field Site** - Stands dominated by yellow-poplar and containing rock piles are signs that an area was formerly cleared. This site was once a cornfield and is a typical result of subsistence agriculture as practiced on the Cumberland Plateau. Analysis of the sites determined an initial loss of one inch of topsoil due to cultivation, followed by general rebuilding of the soil after natural forest succession had resumed.
- 6. Oak Thinning and Pruning** - One of four such plots in the forest, demonstrating growth and quality changes in mixed pole and sapling sized stands of upland oak and red maple. Results indicate that, subjected to crop-tree thinnings and prunings, red maple maintained consistently better quality than co-occurring oaks.

7. Fire Tower - Built by the Civilian Conservation Corps in 1934, this tower is still in use. In 1996, it was named to the National Historic Lookout Register and received special recognition for being one of the few functional towers left in Kentucky.

8. Boardinghouse Interpretive Trail - Leading from the forestry camp to the fire tower, this 0.9 mile trail has interpretive stops, tree identification markers, and a companion guide. It is used to illustrate ecological relationships involving the environment, land use history, and forest vegetation.

9. Administration, Group Facilities, and Sawmill - Construction of cabins was begun by the National Youth Authority in 1939, using salvaged American chestnut logs. They were completed in 1955 and are located at the junction of Boardinghouse Branch and Clemon's Fork, together with the administrative offices for Robinson Forest. The circular sawmill was purchased by the College of Agriculture in 1954. It is used for both training in log and lumber evaluation, and wood science research.

Bucklick Demonstration Area

This area, comprised of a number of stand level silvicultural demonstrations, is used for both formal and continuing education programs in silviculture, measurements, and forest management. Each area has growth and yield plots, data prescriptions, and summary descriptions used for program development.

11. Forestry Training Area- even-aged, well stocked upland oak stand used for basic training in tree and forest measurements and silvicultural prescription.

12. Oak Thinning- demonstration of improved growth and quality of an oak stand after the removal of competing trees. The thinning was based upon the upland oak stocking guide. Pre- and post-thinning data have been summarized and show increased diameter growth after thinning.

13. Even-aged Natural Regeneration- complete and commercial clear cutting are demonstrated on a range of site qualities. This area shows the dynamic nature of naturally regenerating clearcuts and the need for proper techniques when regenerating even-aged stands.

14. Even-aged Artificial Regeneration- demonstrates typical techniques used to convert an upland oak stand to a pine stand. Both Eastern white and shortleaf pines were established after clear cutting; varying prescribed burning and herbicide treatments are demonstrated.

15. Group Selection Openings- established in 1968 to determine the effect of opening size (50, 150, and 250 ft. diameter) and vegetative control treatments on species composition and growth. Two of these openings, 50 ft. and 250 ft. opening are showcased. Results show that oaks and hickories were the dominant species groups in plots with 150 and 250 ft. diameters. Yellow-poplar was present in 150 and 250 ft. openings, and non-existent in 50 ft. openings. Red maple and other species dominated the 50 ft. openings.

Hydrology Studies

Forest hydrology is one of the primary research activities at Robinson Forest. Rain gauges, weirs, and H-flumes can be seen throughout the forest. These instruments are used to monitor the amount and quality of rainfall and streamflow. The data gained from continuous long-term monitoring serves as a reference point against which to compare other watersheds in the Cumberland Plateau. Other important research includes: the use of new technologies to study quantities, sources, and movement of sediment within watersheds; answering the question of how water moves through the soil to a stream, and how nutrients in forest soils are cycled in relation to water movement; active mapping of stream channels to monitor stability of channel banks and changes due to erosion.

Field Branch Clear Cutting BMP Demonstration

Best Management Practices (BMP's) are a set of guidelines designed to help minimize pollutants which can result from poor logging practices. In 1983 a hydrology study was initiated in the three sub-watersheds of Field Branch to compare the impacts of clear cutting, with and without BMP's. Streams in three sub-watersheds were equipped with H-flumes and monitored. Sub-watershed "A" was left undisturbed as a control. "B" was clear-cut using BMP's, while "C" was clearcut using no BMP's. Results showed that when BMP's were used, they reduced the amount of non-point source pollution in the forest streams. Additional information obtained from these studies can be found on interpretive signs in the Field Branch study area.

Lewis/Roaring Fork Demonstration Forest

The 664 acre section of Robinson Forest is being developed as a practical demonstration of forest management techniques applicable to eastern Kentucky. New technologies such as geographic information system (GIS), global positioning surveying (GPS), and laser data collection have been used in conjunction with multi-layered sampling strategies and continuous inventory plots to provide data for planning purposes. This information has been used to produce stand maps, optimal road designs, forest protection strategies, silvicultural treatments, and forest cutting strategies. Demonstrations in this area will complement and build on the concepts demonstrated in the Bucklick Demonstration Area.

This area also contains logging road and skid trail BMP demonstration sites. Hillslope hydrology research in the watershed has been coupled with the demonstration sites and used in silvicultural BMP and non-point source pollution training.