

Raccoon Ecological Management Area: Partnership between Forest Service Research and Mead Corporation

Daniel A. Yaussy, Wayne Lashbrook, and Walt Smith¹

Abstract.—The Chief of the Forest Service and the Chief Executive Officer of Mead Corporation signed a Memorandum of Understanding (MOU) that created the Raccoon Ecological Management Area (REMA). This MOU designated nearly 17,000 acres as a special area to be co-managed by Mead and the Forest Service. The REMA is a working forest that continues to produce timber and pulpwood for Mead. Current Forest Service research within the REMA consists of two sites of a large, oak ecosystem restoration research project, and one site of a long-term oak stand density study. Facilities provide a place for researchers to stay while collecting data, and classrooms for the educational workshops presented for the public. The REMA will provide new sites for silvicultural and other demonstrations.

INTRODUCTION

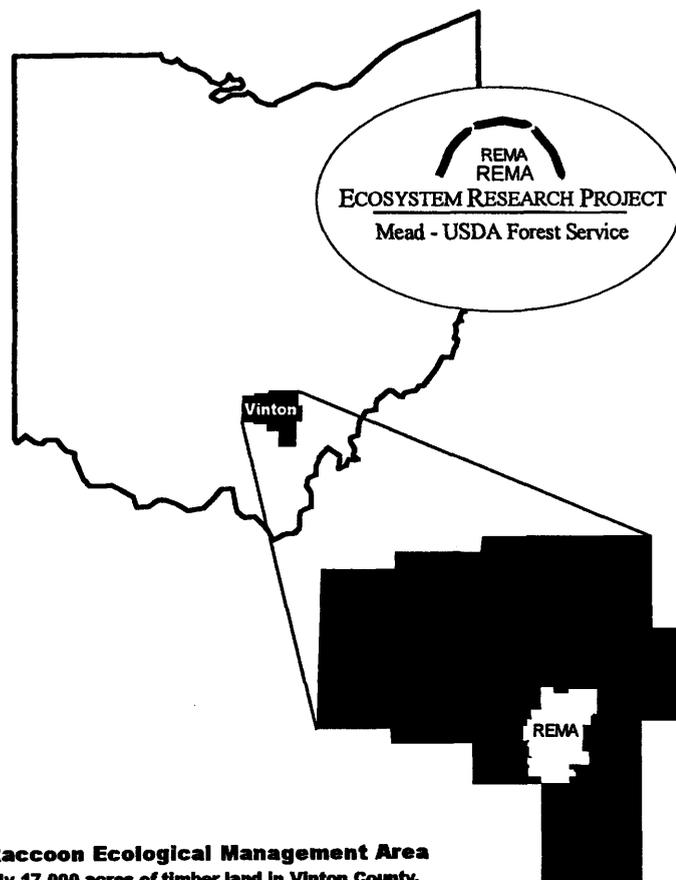
On June 29, 1995, a Memorandum of Understanding (MOU) was signed that created the Raccoon Ecological Management Area (REMA) in southeastern Ohio (Fig. 1). This MOU was signed in the U.S. Congressional Office building by Jack Ward Thomas, then Chief of the Forest Service, and Steven C. Mason, Chairman of the Board and Chief Executive Officer of Mead Corporation.

Mead has operations in 30 countries around the world and is recognized as a leading producer and supplier of paper and paperboard products. Mead has designated their Woodlands Division in Chillicothe, Ohio, as their liaison in this endeavor.

The Forest Service representative for this MOU is the Forest Ecosystem Modeling project located in Delaware, Ohio. The full project title is: Quantitative Methods for Modeling Response of Northeastern Forest Ecosystems to Management and Environmental Stresses. The scientists are involved with studies funded by the Forest Service's Global Change program and Ecosystem Management research grants.

The Forest Service and Mead will cooperatively manage the nearly 17,000 acres of contiguous mixed-oak forest designated as the REMA. The REMA was created to develop and test various forest ecosystem management practices at

¹Research Forester, USDA Forest Service, Northeastern Forest Experiment Station, Delaware, OH; Stewardship Manager and Lands Manager, Mead Corporation, Chillicothe, OH; respectively.



The Raccoon Ecological Management Area
Nearly 17,000 acres of timber land in Vinton County, Ohio, is the site of an extensive Mead Corporation-USDA Forest Service ecosystem research project designed to learn more about forest-related matters such as vegetation, wildlife, soils, landscape ecology, forest health, aesthetics, and other issues affected by forest management practices.

Figure 1.—Location of the Raccoon Ecological Management Area that is jointly managed by the Mead Corporation and the USDA Forest Service.

the stand and landscape scale. This is a working forest rather than an experimental forest and Mead retains all rights to manage the tract as needed. The cooperators are developing a management plan for the area that will identify near-term and long-term opportunities for research.

HISTORY

The REMA is the largest area of contiguous forest in Ohio under private ownership. It is located in the Hanging Rock region, which was a large producer of iron ore before and during the Civil War. The area had two iron furnaces that operated between 1850 and 1890 (Hutchinson²). The

²Hutchinson, Todd. In preparation. History of the mixed oak forests and land-use in Southern Ohio.

surrounding hillsides were cleared, repeatedly, to produce charcoal used to smelt the iron ore. After the furnaces closed, the land reverted to forest with some limited farming and grazing activities. There is evidence that low intensity wildfires burned through the area every 2 to 3 years (Sutherland 1997). Disturbance history (clear cutting, ample stump sprouts, frequent fires, and possible grazing) determined the species composition of the resulting forest. The overstory of the existing forest is 100 to 150 years old, consisting mostly of white, chestnut, scarlet, and black oak (*Quercus alba*, *Q. prinus*, *Q. coccinea*, *Q. velutina*). In 1952, Baker Wood Preserving Company bought land in Vinton County, Ohio, and set 1,200 acres aside for use by the Forest Service as the Vinton Furnace Experimental Forest (VFEF). A decade later, Mead purchased the tract and maintained the relationship with the Forest Service.

Many of the studies and demonstrations on the VFEF date from the mid to late fifties and include the comparison of different cutting practices on timber production and species composition, the effect of the size of canopy opening on composition of regeneration, conversion of dry sites to pine, and the effect of understory removal on the growth of the overstory. Like many of the experimental forests in the East, we claim that Ben Roach, a well-known research silviculturalist, performed much of his research on complete clearcutting and stand density on our forest.

FACILITIES AND EDUCATION

The headquarters area of the VFEF consists of an equipment shed, fuel shed, an office and lodging for overnight stays, and an education/workshop building. In 1996, Mead and the Forest Service conducted 33 tours and training exercises on the VFEF and REMA involving 812 people. Many of the tours are presented by Mead to wholesale purchasers of their products. These "Paper Knowledge Tours" start in Mead's Chillicothe paper mill and end at the VFEF with visits to some of the demonstration areas. We also have provided tours for college classes from The Ohio State University, Hocking College, and the University of Kentucky. Last year we even had a group from Sweden. Other tours have been given to the local Sierra Club, state legislators, and the Farm Bureau.

Hocking College and Mead also use the facilities to conduct courses in Best Management Practices, Clear Water, Chainsaw Safety, Logger Training, and Sustainable Forestry. The VFEF was also a site for the Society of American Foresters Central States Forest Soils Workshop in 1995.

With the intense use of the area for tours, workshops, and education, Mead is planning to replace the vintage World War II Quonset hut used as a classroom, with a new training/workshop building.

CURRENT RESEARCH

Current research on the REMA includes a study on the effects different thinning levels have on residual trees, development of a computer based ecosystem classification

system, a study of the effects of prescribed burning on the ecosystem, and a case study to regenerate shortleaf pine under a shelterwood system. The thinning-level study was installed in 1959 as one of two sites on Mead land in Ohio. Two other replications were located on the Daniel Boone National Forest in Kentucky. The original goal of this study was to develop recommended levels of thinning for management of even-aged upland oak stands. The information has been incorporated into the GROAK and OAKSIM growth and yield simulators. Although most of the information on the effects of thinning have been reported, we are continuing to remeasure the plots every 5 years. We are currently using the control plots for a drought/mortality study to determine which soil and climatic factors are related to differential mortality of species.

In 1993, Mead planned to harvest a mixed shortleaf pine-oak stand and allow it to regenerate to hardwoods. When Forest Service scientists were asked if they had any suggestions, the idea of a shortleaf shelterwood cut was proposed. So far the results have not been favorable. Our plans are to conduct a prescribed burn through part of the site to improve conditions for seeding.

Using the information available from a Geographical Information System (GIS), Iverson and others (1996) developed an integrated moisture index for the REMA. The index uses information from the county soil survey and a digitized topography map to compute the influence of slope, aspect, water flow, curvature, and water-holding capacity on the amount of moisture available to the trees. This computer generated index can predict species composition and site index. It is now used as a variable in any study being planned by our project.

The largest field study in which our partnership is involved is the "Effectiveness of prescribed burning in the ecological restoration of mixed-oak forest ecosystems in southern Ohio". Two study areas (250 acres each) are located on the REMA, with an additional two areas on the Ironton District of the Wayne National Forest. The premise of this study is that prescribed burning will remove much of the understory competition to oak seedlings (red maple (*Acer rubrum*), sugar maple (*A. saccharum*), dogwood (*Cornus florida*), and blackgum (*Nyssa sylvatica*) saplings) and allow them to advance to the sapling stage, thereby providing advanced reproduction to replace overstory oaks lost to mortality or harvesting. Various aspects of the ecosystem are being studied by many partners. Scientists from The Ohio State University are studying the effects of prescribed burning on neo-tropical migratory birds, soil microbiology and nutrients, and insects. The Ohio Department of Natural Resources, Division of Natural Areas and Preserves is cooperating with The Nature Conservancy in studying the effects of the fires on herbaceous plants. Ohio University is investigating the effect of burning on the amount of light reaching the forest floor. Forest Service scientists are monitoring the species composition, mortality, and quality changes of the woody species.

With the efforts of so many scientists concentrated on these areas, interesting offshoot studies have emerged concerning

threatened and endangered (T&E) species. One of the largest populations of timber rattle snakes, on Ohio's T&E list, has been located and tracked. Individual snakes have been captured and implanted with radio transmitters so that their movements could be followed throughout the year. The larger males can roam up to 5 miles before returning to the den.

A former candidate for the federal T&E species list is Bentley's bent reed grass (*Calamagrostis porteri* var. *insperata*). This species has been found in large patches on both of the study areas of the REMA, but is found in only a few locations in Missouri, Arkansas, and Illinois (Schneider 1995). Potentially the largest populations in the world are on the REMA. This plant rarely flowers and viable seeds have never been found.

CURRENT MANAGEMENT

As a member of the American Forest and Paper Association (AF&PA), Mead subscribes to the principles of the Sustainable Forestry Initiative (SFI). These principles focus on 1) sustainable forestry, 2) responsible economic and environmental practices, 3) forest health and productivity, 4) protection of sites with special significance, and 5) continuous improvement of forestry practices. During the past 2 years, some 2 dozen companies have resigned their membership from AF&PA, and another 15 companies have been suspended from membership for failure to confirm their participation in the SFI. Even with the loss of these companies from the program, the 150 association members own or control 52.7 million acres of the 70 million acres of industrial forest land in the nation.

Currently, Mead is in the process of removing veneer-quality stems from the REMA tract and plans to complete this by the year 2000. This management is in response to two different pressures: forest age and gypsy moth. In the 100- to 150-year old forest, many of the scarlet and black oaks have died or are dying and the older stems are being recovered before the value is lost. The other major threat is the gypsy moth (*Lymantria dispar*) which should have an impact within the next 5 to 10 years. The gypsy moths' preferred food is oak leaves which jeopardizes the REMA. Removal of oaks from the overstory is one of the silvicultural methods of reducing the risk of mortality due to gypsy moth (Gottschalk 1993). These removals are being conducted with an advanced forwarder designed to reduce the impacts on the soils and are not occurring on sites where there is current or planned research.

Mead does not own the mineral rights under some of the REMA surface. Strip mining for coal is occurring in the southwestern corner of the tract and there are threats to the northern portion. In areas in which stripping is imminent, Mead is recovering all the wood resource possible. These areas do not lend themselves to the establishment of long-term forest management research.

FUTURE RESEARCH

Mead and the Forest Service are in the planning stages of implementing a landscape-scale inventory and monitoring

scheme, which is needed to develop a long-term management plan for the REMA. This will involve the use of permanent plots with collection of data from ecosystem components other than just the timber resource. These methods, when developed, could be used in National Forest Systems (NFS) landscapes as well as those of industrial forest lands to provide estimates for any portion of the area.

Areas are being located for an extension of the prescribed burning study. In the new areas, we will use herbicides to remove larger poles and saplings as recommended by Loftis (1990). With the exclusion of fire in the recent past, many stems of maple, dogwood, blackgum, and other shade tolerant species, have grown into the understory of the oak dominated overstory. This understory can contain up to 30 percent of the stocking in a stand. We are proposing to remove this shade tolerant understory with the injection of herbicides. Prescribed burning will be used on half of the sites to promote the establishment of oak seedlings and sprouts. This study will be installed on relatively moist sites, where advanced regeneration of oak seedlings and saplings is seldom present.

With Mead's commitment to the Sustainable Forest Initiative, they are quite interested in evaluating the effects of short rotations on the productivity of the soils. With the deposition of atmospheric nitrogen reducing the amount of calcium available to the trees, they are looking for strategies to mitigate the effect with the use of mill sludge and stack ash.

CONCLUSION

The creation of the REMA and the partnership between the Forest Service and Mead are beneficial to both entities and the communities within Ohio. The long-term and cutting-edge research in the area involves and benefits Forest Service scientists, Mead, the NFS, universities and state agencies. The educational programs and tours improve logging and forestry practices within Ohio and inform the public what forestry is and what it can be.

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