

Communicating Old-Growth Forest Management on the Allegheny National Forest

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Abstract.—Successful communication of old-growth management, including the role of silviculture, is achieved by integrating as a working whole the topics addressed in this workshop. We have used research, technology transfer and adaptive management to achieve this integration on the Allegheny National Forest. Program success depends on scientists and practitioners working together. Scientists spend more time in joint technology transfer activities and helping practitioners implement operational-level trials of new silviculture, including co-development of inventory and monitoring plans. Practitioners too have increased technology transfer responsibilities. Practitioners must think more like researchers, conceiving and applying innovative management but also developing ways to monitor the effects of those treatments.

INTRODUCTION

Successful communication of the role of silviculture in old-growth forest management is achieved by integrating, as a working whole, the topics outlined in this meeting's agenda: policy, inventory and monitoring, research, demonstration, education, and partnerships. To achieve this integration in managing old-growth forests on the Allegheny National Forest (ANF) we have:

- (1) listened to the public to understand their values and needs,
- (2) implemented new research to answer questions,
- (3) used adaptive management to learn as we go,
- (4) led discussions and field trips to reach agreement on policies,
- (5) spread the word to increase knowledge and understanding of old-growth forests, and
- (6) welcomed partners to join us in developing a better understanding of old-growth.

Conservation of biological diversity has become an important focus of forest management (Society of American Foresters 1991). Providing all forest seres across the landscape from early-successional through old-growth is one approach to achieving this goal (Harris 1984; Hunter 1989; Oliver and Larson 1996). In Pennsylvania, recent efforts to promote the conservation of biodiversity have called for the protection and enhancement of old-growth forests (McGuinness 1995; Rooney 1995).

Most eastern forests are dominated by early to mid-successional communities. Only about one-half of one

percent of Pennsylvania's forests are old-growth (Smith 1989). Interest in preserving existing old-growth, finding new remnants, and developing old-growth from younger forests is growing in the Northeast.

The challenges of communicating old-growth forest management are many:

-LISTENING - Practitioners and researchers must understand the values (ecological, social, visual, and spiritual) the public associates with eastern old-growth.

-UNANSWERED QUESTIONS - Researchers must investigate the ecology of old-growth including studies of structure, functions and processes associated with old-growth forests and convey this information to practitioners and the public.

-LEARNING AS WE GO - Researchers and practitioners should employ adaptive management strategies to restore old-growth characteristics and monitor succession.

-GETTING EVERYONE ON THE SAME PAGE - Researchers, managers, policy makers, and the public must develop a common understanding and reach agreement on old-growth policy.

-SPREADING THE WORD - Education is a continuous process. As researchers and practitioners learn more about eastern old-growth, we should take every opportunity to convey this to the public.

-JOINING IN THE FUN - As interest in eastern old-growth grows, opportunities to develop partnerships for research, technology transfer, and adaptive management will increase.

This paper describes how communication between practitioners, research scientists, and the public have aided the development and understanding of old-growth management on the Allegheny National Forest.

LISTENING

In 1986 when we began implementing the Forest Plan we designated old-growth on a project-by-project basis. For example, if we were proposing a timber sale in an area, we would designate about five percent of the area as old-growth as specified in the Forest Plan. The public questioned our approach, stating that it was rather piecemeal and didn't clearly demonstrate what old-growth values we were trying to promote.

In response to these comments, an interdisciplinary team was formed to evaluate old-growth values on a landscape scale. The result was a landscape approach to providing old-growth values that connected the large forested parcels with continuous canopy corridors. These large, relatively unfragmented parcels include the 10,000 acre Hickory Creek

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LANDSCAPE CORRIDOR FRAMEWORK

- Roads
- ⌞ ANF Boundary
- ~ Rivers/Streams
- ☛ Core Areas
- ☛ Landscape Corridors

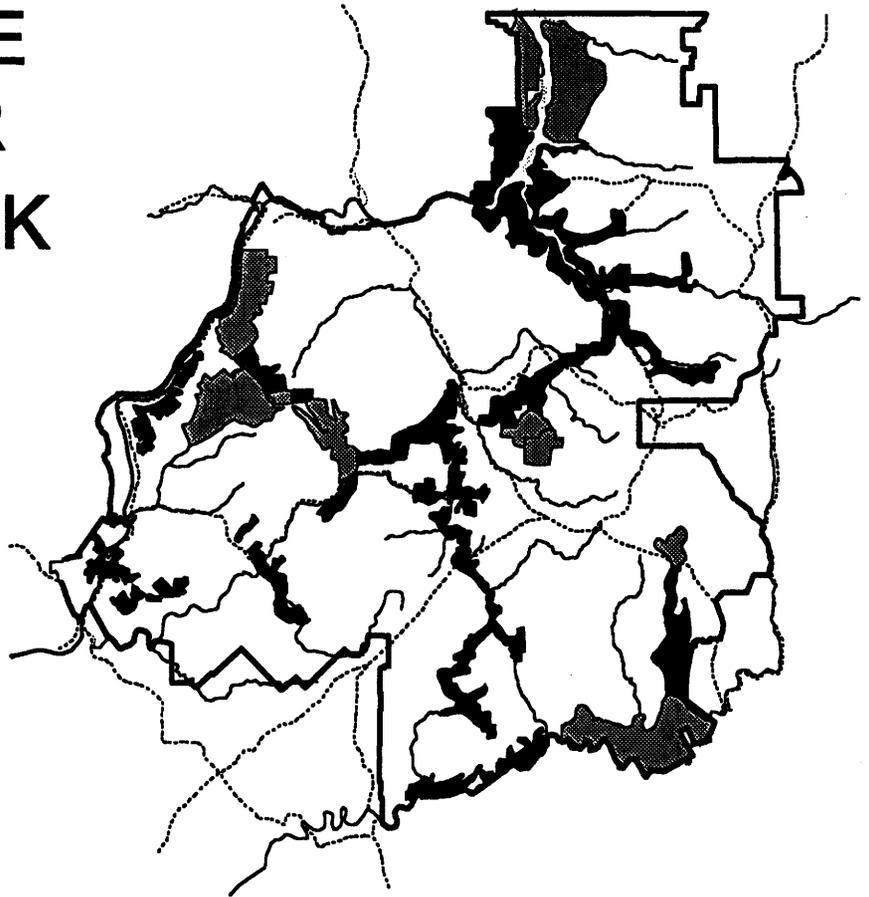


Figure 1.—Landscape corridor and core areas designated for late-successional and old-growth forests and related values on the Allegheny National Forest.

Wilderness, 9,000 acre Tracey Ridge National Recreation Area, 3,000 acre Cornplanter National Recreation Area, 7,400 acre Allegheny Front National Recreation Area, 4,100 acre Tionesta Scenic and Research Natural Areas, 3,400 acre Clarion River area, 1,300 acre Minister Valley area, and 1,400 acre Brush Hollow area. These core areas are connected by 82,000 acres of corridors (Fig. 1).

Four primary objectives for the corridor were identified by the team: connectivity, late successional/old growth habitat, riparian values, and social and amenity values (Allegheny National Forest 1995). The connectivity objective is intended to facilitate the movement of less mobile species such as amphibians, reptiles, and small mammals so they can leave areas of disturbance that do not fully meet their habitat needs and repopulate nearby areas that are recovering from past disturbance; enhance habitat for forest interior neotropical migratory songbirds by providing large blocks of contiguous forest; and facilitate genetic flow between metapopulations of less mobile species, including trees. The late successional/old-growth forest habitat objective is intended to provide habitat to meet the needs of threatened, endangered, and sensitive species; provide habitat for species requiring isolation from major human activities,

species that use cavities, and species that use large woody debris; and promote ecological processes (energy flows, nutrient cycles, hydrologic cycles) that develop in late successional forests. The riparian objective is intended to complement on-going ANF initiatives to improve fisheries habitat by developing a stable source of large woody debris for some streams; and complement the on-going ANF initiatives to maintain or improve water quality and reduce sedimentation through protection of riparian areas. The social and amenity objective is intended to maintain and enhance visual quality of the forest, especially in sensitive viewsheds; and maintain and enhance recreational and amenity values associated with late-successional and old-growth forests.

A brochure and table-top display were developed to solicit additional public comments on the landscape corridor approach. Presentations and/or displays were given at more than 18 conferences, workshops, and meetings and 36 individuals responded in writing. With this input we designed the landscape corridor to meet a variety of objectives, functions, and values. While old-growth values are featured in the corridor, other objectives may be more important in some areas than in others (Allegheny National Forest 1995).

UNANSWERED QUESTIONS (RESEARCH)

Over the course of the last decade, we have learned of many unanswered questions for old-growth management on the ANF. We have also learned that much research has been conducted in ecology and silviculture, all the way back to the 1920s, that is useful in old-growth management today. Research answers and needs can be organized into three areas: ecosystem dynamics, human dimensions, and silviculture and resource management. We present a brief history and the questions yet to be answered in each.

Ecosystem Dynamics

We need research in ecosystem dynamics to gain insights into ecological states and processes of old-growth. Our goal is to learn about ecological capabilities so that desired future conditions for stands and landscapes can be developed, and management programs can be implemented that may include silviculture to sustainably promote old-growth values.

Ecological research extends back to the late 1920s with the work of Hough, Lutz, Morey and others. At that time, there were still tens of thousands of acres of virgin forest within the 700,000 acre ANF proclamation boundary. Scientists studied many of these forest as they were being cut. In one such study, Hough and a crew of over 20 from the Civilian Conservation Corps aged 100s of trees across a 7,000 acre hemlock-hardwood old-growth remnant as it was being cut (Hough and Forbes 1943).

Today, less than 5,000 acres of remnant old-growth exists on the ANF, most of that in the 4,100 acre Tionesta Scenic and Research Natural Area. This remnant and others, including Hearts Content, a 120 acre white pine-hemlock-hardwood remnant, have been valuable for studying old-growth. Over 50 research papers have been written on the Tionesta and Hearts Content areas, with 15 on-going studies across both areas today. A key to our old-growth management program has been the availability of the Tionesta and other remnants, both for education and for research.

Studies in the past focused on the state of old-growth with detailed descriptions of tree size and age distributions and species composition. There were few function- or process-level studies, with the exceptions being Hough's studies of regeneration, succession, and soil-site-species relations. Landscape perspectives on old-growth were anecdotal.

We need more basic information on ANF old-growth, including more information on states (e.g., coarse woody debris, wildlife communities, fungi, and invertebrates). Future research should be focused on understanding functions and processes. We need studies in disturbance regimes, forest stand dynamics, soil development, biogeochemical cycling, and species-site relations. While we have current studies in many of these areas, we need many more, and we need them soon.

Human Dimensions

Research defines the values people derive from old-growth and determines whether management can culture stand and landscape conditions to provide those values. We have learned some of this through the National Environmental Policy Act process and our experiences in information and technology transfer, but much could be learned with formal social study.

Silviculture and Resource Management

Silviculture is becoming recognized as having a prominent role in restoring and sustainably maintaining old-growth ecosystems. For the ANF, indepth silviculture knowledge is available. Many of the same scientists who described the old-growth forest during the 1920's and 1930's, as cited above, also conducted silviculture research. Preliminary silviculture guides were developed by Hough and others in the 1940's and 1950's (Hough 1953, 1959; Hough and Forbes 1943). These guides have been substantially revised and expanded (Marquis et al. 1992; Marquis 1994). While silvicultural techniques and methods were chiefly developed for timber values, they can be modified to achieve old-growth values. New silvicultural practices can be developed specifically for old-growth. We are presently using both old and new silviculture to restore some old-growth values to the ANF.

LEARNING AS WE GO (ADAPTIVE MANAGEMENT)

We have implemented some of our knowledge of ecosystem dynamics, human dimensions, and silviculture into operational-level forest management using an adaptive management approach. We have released subordinate conifers in maturing hardwood forests. We have underplanted conifers in partial cut hardwood stands. And we have maintained coarse woody debris during tornado salvage and enhanced coarse woody debris during partial cutting. We have demonstrated these practices, and related them to desired future conditions to generate reaction and feedback from stakeholders. We are in the process of analyzing the results of these interactions and will, if necessary, refine or change management practices so as to better achieve the desired future conditions.

All of these treatments—conifer planting and release and proactive management of coarse woody debris by leaving or creating large dead wood structures—took place in the landscape corridor (see previous section). The corridor and its core areas are the key to ANF old-growth. The core areas include both old-growth (Tionesta and Heart's Content) and unmanaged second-growth forest which will develop into old-growth in 200+ years. There are nearly 40,000 acres of core areas. The 82,000 acres of landscape corridor will be managed proactively to meet objectives, including old-growth values. We will continue to work on developing desired future conditions for this area, alter the vegetation with silviculture to accelerate attainment of these conditions, and monitor the effects of silviculture treatments in sustainably providing old-

growth values. We are exploring management buffer zones around the core areas. And in addition to the landscape corridor-core area system, small remnants of old-growth outside the corridor-core areas will continue to be preserved. In total, nearly 25-percent of the ANF is being managed for old-growth values.

Major disturbances may occur in the landscape corridor that could jeopardize some of the late-successional and old-growth values that we are striving to perpetuate. Insect and disease outbreaks of native and exotic species and cyclic windstorms, particularly tornadoes, will result in the loss of some portion of overstory trees, increasing the amount of light reaching the forest floor and increasing the amount of dead wood in the forest. If a catastrophe results in substantial tree mortality such that connectivity and late successional objectives cannot be met, restoration activities that feature silviculture such as planting and fencing to prevent overbrowsing by deer may be implemented.

GETTING EVERYONE ON THE SAME PAGE (CONSISTENT POLICY - TECHNOLOGY TRANSFER)

Multiple objectives, refined definitions, and taking a long term view at a broader scale are factors that have contributed to the complexity of the landscape corridor/old-growth concept. On the Allegheny National Forest, we have found that discussing old-growth issues in the woods gives all participants a common understanding of the complex situation and helps us reach agreement and consensus. We have spent a day with the ANF Forest Leadership Team in Tionesta Scenic and Research Natural Areas viewing and discussing the differences between late-successional forests and true old-growth, and how species composition, levels of dead wood, and wildlife use change as forests become older. We have reviewed the implementation of some of our corridor projects with many ANF employees and publics to determine if we did what we said we would do and if we achieved the results we were striving for.

SPREADING THE WORD (EDUCATION)

Perhaps it is obvious, but we should take every opportunity to share information and explain to the public our late-successional and old-growth policy. Although not always possible, we believe the best way to communicate our message is in the woods viewing old-growth first hand. Last year we led field discussions with more than a dozen groups (>200 people) to discuss old-growth on the ANF.

Discussions of succession and how old-growth characteristics develop over time have helped people understand how old growth develops. A simple distinction between late-successional forests and old-growth forests has helped us communicate the importance of time in developing old-growth values. Late-successional forests, transitional old-growth, and potential old-growth are all used to describe forests between 111 and 300 years old (111 years is used in the ANF's Forest Plan as an old-growth threshold). Forests older than 300 years are defined as true old-growth or

ecological old-growth. These definitions, which follow the recommendations of Oliver and Larson (1996) and research results specific to hemlock-hardwoods by Tyrell and Crow (1994), have been useful in discussing the temporal aspects of old-growth values and how some old-growth values accrue during the late-successional forest stage and peak during the old-growth stage. Discussion of the spatial aspects of old-growth, embodied in the landscape corridor itself, have benefitted from Mladenoff et al.'s (1993) and Lorimer and Frelich's (1994) descriptions of presettlement hemlock-hardwood landscapes in the Midwest.

JOINING IN THE FUN (PARTNERSHIPS)

Interest in eastern old-growth is growing and with that interest comes many questions that warrant investigation. Many researchers have studied a piece of the puzzle, but few opportunities to bring all the pieces together have occurred. Last summer, we brought all the researchers together who have studied various components of the Tionesta Research Natural Area. Each researcher had the opportunity to discuss his/her research and learn from the research findings of others. The result was a better and more holistic understanding of eastern old-growth and the generation of more questions that need investigation. We plan to continue these research cooperator meetings every other year.

To evaluate the success of the landscape corridor and core area concept in meeting identified objectives, a carefully designed monitoring program should be implemented. This program can include the monitoring of selected wildlife communities, plant communities, and featured habitats such as late-successional habitats and riparian areas. We recognize that no single agency could undertake all the monitoring that is needed to answer the many questions concerning landscape corridors and late-successional forests. We openly invite colleges, universities, and other partners to become actively involved in monitoring, research, and adaptive management in old-growth forest management on the ANF. To meet this end, we have taken our show on the road, soliciting scientific input from outside the Forest Service through various workshops and field tours. A workshop we ran this past spring at The Pennsylvania State University resulted in two new research projects, one on hemlock woolly adelgid and the other on watershed nitrogen dynamics, both to occur in the old-growth on the Tionesta Scenic and Research Natural Area.

IN CLOSING ...

The success of communicating old-growth policy and the role of silviculture in management of old-growth forests depends on scientists, practitioners, and the public working together. Scientists spend more time in joint technology transfer activities and helping forest managers implement operational-level trials of new forest management. Practitioners must understand the values that the public associates with old-growth forests and incorporate these values into old-growth management policies. Practitioners must continue to conceive and apply innovative management, and also develop research-like ways to

monitor the effects of those treatments. Each—scientist and practitioner—needs to spend more time helping others understand their own knowledge and experience. Synergism will occur. Policy and practice will change and our understanding of old-growth will increase, all to the benefit of the forest.

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