The Other Half of a "Forever Wild" Park: Education and Research at the Adirondack Visitor Interpretive Center

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Introduction

The lands of the state, now owned or hereafter acquired, constituting the forest preserve, as now fixed in law, shall be kept as forever wild lands.

Those now famous words of Article XIV of the New York State Constitution changed forever the nature and development future of the rugged and wild upper one-fifth of New York State. That area, the Adirondack Park, is a land that will always be associated with the forever wild clause of the state constitution. As tourists and residents alike drive through the Park, on their way to hike its trails and marvel at the natural beauty of this forever wild land, they might well have reason to question where all the truckloads of logs are coming from?

The answer lies in Article XIV, *The lands of the state, now owned or hereafter acquired . . .* What makes the Adirondacks unique is that this park is a mix of forever wild state lands, of people, their towns and villages, and of privately owned lands. Approximately fifty percent of the land within the Adirondack Park is privately owned. Most of this private land is in forest cover and on much of it the primary purpose of ownership is forest management. Each year 22 million board feet of timber and 65 million cubic feet of pulpwood are harvested from the six counties that comprise the majority of the Adirondack Park (Alerich and Drake 1995). The annual value of the wood harvested exceeds 75 million dollars. Forest-based industries located within the Park and surrounding the Park are a major source of Adirondack employment. Manufacturing, with woodbased enterprises as the dominant form, accounts for 14.8 percent of personal income and 23 percent of the employment opportunities for Park residents (Dunne 1990). Forestry on private lands not only provides economic support for the people of the Park, but also, as an alternative to land subdivision and development, helps to maintain the open space character of the Park.

So what do those private forest lands look like after the log trucks roll on down the road? What ecological changes take place after a harvest? And what are the social, ecological, and economic constraints under which Adirondack forests should be managed? To begin to answer some of those questions and to bring into public view the forest management side of the Adirondack landscape, Paul Smith's College, the Adirondack Park Agency Visitor Interpretive Center (VIC) and the Northeastern Research Station of the USDA Forest Service have partnered to establish a study and interpretive site known as the Forest Ecosystem Research and Demonstration Area.

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Forest Ecosystem Research and Demonstration Area

The Forest Ecosystem Research and Demonstration Area (FERDA) is located at the Adirondack Park Visitors Interpretive Center at Paul Smiths. FERDA consists of fourteen five-acre blocks. Seven are along the Jenkins Mountain Road, an easy half-mile walk from the Interpretive Center (Figure 1). The remaining seven blocks are at a more remote location near Keese's Mills Road.

The trees on five blocks at each site were harvested during the winter and spring of 1999-2000, using the following silvicultural systems: single tree selection, group selection, two aged management, shelterwood, and clearcutting. Each treatment was designed to achieve specific forest management and ecological objectives. All treatments except the clearcut included the general objectives of, where possible, maintaining and promoting red spruce and hemlock for visual variety and wildlife habitat, discriminating against mature balsam fir that were likely to die soon from age, retaining standing dead trees for wildlife habitat, and retaining any mature beech that were relatively free of beech bark disease. Two blocks at each site remain unharvested as research controls (Table 1).

FERDA has research goals as well as the educational goal of interpreting forestry practices in the Park. To achieve the scientific goals, two years of extensive biological studies were conducted prior to harvest. Botanical inventories were conducted on each block, and a series of nested plots were sampled to quantify ground cover, the shrub layer, and the forest overstory. The physiography at each block was characterized and transects were run to estimate the coarse woody debris on the forest floor. With these baseline data, variation between the two sites and within blocks at each site can be accounted for statistically (Table 2). Over time, this will allow a detailed quantification of ecological change resulting from the various treatments.

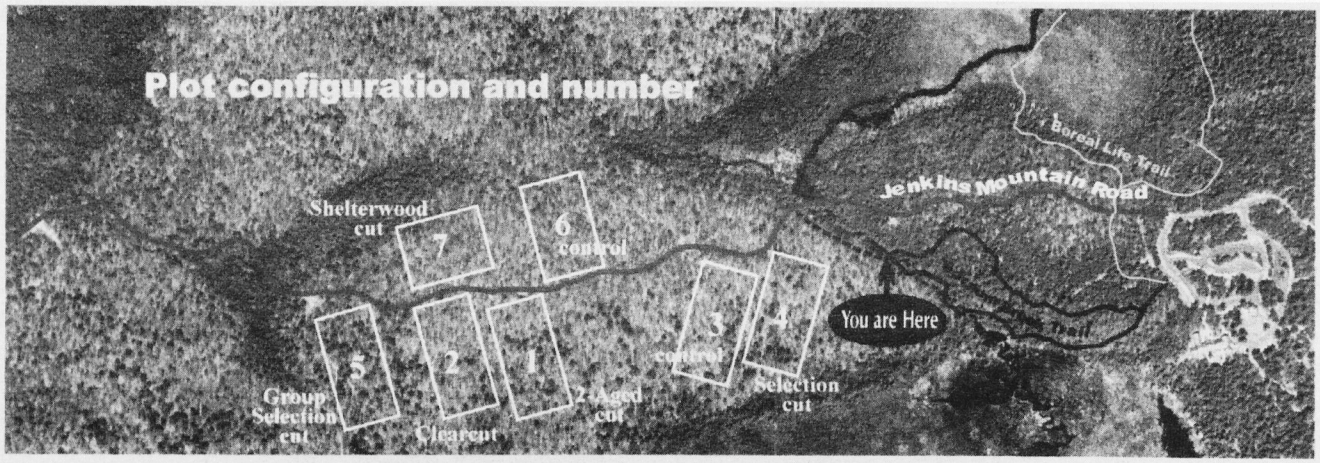

Figure 1.

Scientific Studies

A number of scientific studies are currently being conducted on the FERDA site. It is expected that additional studies will be conducted in the area as the impacts of the harvesting treatments become more apparent. Present research includes investigations in five principal areas.

I. The Effects of Logging Practices on Forest Vegetation and Flora in the Northern Hardwood Forest.

The goals of this study are to: (1) determine the effects of different harvesting prescriptions on the floristic composition of stands in Adirondack forests, (2) to determine the rates of floristic and vegetation change of logged stands over time, and (3) educate the public on different kinds of harvesting and their effects on visual appearance, floristic composition, and the patch contribution to biodiversity in the greater landscape. This study led to the extensive botanical baseline data that was collected at FERDA. These floristic studies will continue into the future as we learn more of the impacts of forestry practices on regional biodiversity and on the rate at which forest ecosystems recover to pre-harvest conditions. Public education will be provided through on-site tours, interpretive signs along the trail, brochures available at the VIC, a web site, and publications in popular press and scientific journals. Investigators include: Michael A. Rechlin, Paul Smith's College , Gary Wade and Mark Twery, USDA Forest Service, Northeastern Research Station.

II. Faunal Diversity and Silvicultural Practices.

The goal of this study is to document relative species abundance of herpetiles (amphibians and reptiles) and ants before and after silviculture treatments. Herpetiles and ants are particularly sensitive to fine-scale environmental changes. Little is known, however, about the relationship between forest management practices and species diversity of herpetiles and ants. This study is an initial attempt to determine how selected silvicultural practices affect the ability of forests to support small fauna with more limited mobility than more-frequently studied mammals and birds. In conducting this study intensive searches of leaf litter, dead and down wood, undersides of rocks, and open areas were conducted to locate herpetiles and ants on study plots. Herpetiles were identified on location to the species level, photographed, and released. Samples of ants were collected for identification in the laboratory. Investigators include: Luis Malaret, Dianne E. Rocheleau, Monika Szymurska, Ramon Malaret, Alice Hovorka, Robin Roth, and Alec Brownlow of Clark University, and Marla R. Emery, USDA Forest Service Northeastern Research Station.

III. Social Constituencies of Adirondack Ecologies.

The goals of this study are to: (1) Develop methods that reveal plant and animal communities associated with people under different management scenarios, (2) document floral and faunal diversity across a spectrum of Adirondack Park Agency land-use categories and (3) compare the diversity and relative abundance of selected floral and faunal groups in urban, suburban, recreational, resource management, and protected areas. In this study social and ecological surveys are being conducted to link floral and faunal data to human activity, knowledge, perception, and intent. Both types of data are being collected on a stratified random sample of 48 plots in five APA land-use categories. Study sites range from the low intensity recreational land use at the FERDA site, to highly manipulated sites in the vicinity of Tupper Lake. Social data are collected using structured and semi-structured interviews, focus groups,

Table 1. Silvicultural treatments on FERDA research blocks.

Regeneration System	Procedures	Objectives
Control no tree cutting	Monitor conditions over time.	To see changes that occur to the forest over time without cutting disturbances. Natural tree death and replacement.
Single Tree Selection	Plan residual stand to include a well balanced distribution of size classes. Cut enough trees in each size class to approach desired distribution and provide timber products at 20-year intervals. Scatter trees to be cut so that no individual openings are large.	Increase or maintain shade-tolerant species such as sugar maple and hemlock. Maintain habitat for forest interior bird species. Maintain a forest with well-distributed trees of all ages and sizes.
Group Selection	Plan residual stand to include a well balanced distribution of size classes. Cut enough trees in each size class to approach desired distribution and provide timber products at 20-year intervals. Concentrate cutting in small groups to provide light to the forest floor.	Maintain shade-tolerant species such as sugar maple, beech, and hemlock, but allow for some additional species to prosper. Maintain habitat for forest interior bird species. Maintain trees of all ages and sizes.
Two-age	Cut most trees greater than 10 inches in diameter to create a new less crowded forest with some medium sized-trees and many seedlings. Provide timber at 50-year intervals. Distribute cutting evenly to provide light to the ground and promote new growth.	Maintain current forest composition. Provide enough light to the ground to allow light-loving species to prosper and mix with shade-loving species, without ever having to lose the feeling of a tall forest canopy. Maintain habitat for forest interior bird species as well as creating habitat for other animals.
Shelterwood	Cut 60-70 percent of canopy trees. The residual large trees are well distributed and provide seed, some shade, and protection for new seedlings. Encourage yellow birch. Canopy trees may be removed in 10-20 years after producing valuable additional wood growth, after the new trees are large. Two entries per 100 years.	Create a new mixed forest with light-loving species such as yellow birch and cherry as well as maple and spruce. Increase deer browse and berries. Create habitat for birds requiring open areas without closed crowns but maintain enough large trees to keep the look of a forest until the new trees are larger. Maintain enough shade to protect forest interior ground plants.
Clearcut	Cut all trees to create an even-aged forest of light-loving species. One cutting entry every 100 years.	Convert stand to predominantly shade-intolerant species such as white birch, aspen, and cherry. Greatly increase deer browse and berries. Create habitat for birds requiring open areas without closed canopies.

Table 2. Comparison of ecological characteristics between FERDA sites

Attribute:	Jenkins Mtn. Road Blocks	Keeses Mill Road Blocks	All Blocks
Total Species Richness	76	89	99
Mean Stand Species Richness Mean / Range	54.0 48-66	53.3 39-72	53.6 39-72
Sørenson's Index of Similarity Mean / Range	0.84* + 0.75-0.88	0.75 + 0.65-0.86	0.74 ++ 0.63-0.84
Presence of seeps, streams, wetlands (%)	29	29	29
Canopy Closure (%) Mean / Range	86 * 81-90	81 73-88	83 73-90
Shrub Cover (%) Mean / Range	23 * 18-31	30 22-43	27 18-43
Low Ground Cover (%) Mean / Range	33 24-39	42 22-55	37 22-55
Canopy as Hardwoods (%) Mean / Range	92 80-99	89 75-100	91 75-100
Total Number Trees $\geq$ 2.5 cm ha^{-1} Mean / Range	1929 1269-2679	1778 1454-2349	1860 1269-2679
Number Saplings 2.5 - 10.0 cm ha^{-1} Mean / Range	1513 821-2361	1379 1059-2003	1446 821-2361
Number Big Trees > 45.7 cm dbh ha^{-1} Mean / Range	20 12-28	34 12-59	27 12-59
Mean dbh (cm) Mean / Range	3.8 2.7-4.8	3.9 2.8-4.8	3.8 2.7-4.8
Relative Density [100 = fully stocked] Mean / Range	96 90-114	105 88-125	100 88-125
Basal Area (m ha^{-1}) Mean / Range	26.5 22.9-31.5	30.3 22.0-36.5	28.4 22.0-36.5

* stand values followed were significantly different (t-test, = 0.05).

+ These similarities are based on all possible pairwise within-site comparisons, n = 21.

++ These similarities are based on all possible pairwise between-site comparisons only, n = 49.

Autumn Splendor. Drawing by Barry Hopkins.

and participant observation to obtain information on land owner/user/manager preferences, perceptions and practices as well as ecological history. Detailed sketch maps compiled with owner/managers document landscape patterns and species distributions within the larger land holding. Ecological data on selected plant and animal species are gathered through intensive inventories of 25m-diameter plots. Investigators include: Dianne E. Rocheleau, Luis Malaret, Alice Hovorka, Robin Roth, Monika Szymurska, and Alec Brownlow of Clark University, and Marla R. Emery, USDA Forest Service, Northeastern Research Station.

IV. Human Values, Preferences, and Acceptable Tradeoffs in Forest Management.

The goals of this study are to: (1) assess human values, preferences, and acceptable tradeoffs with respect to forest management, harvesting, and land use alternatives, and (2) identify and describe differences in the preference structures of individuals and groups. This study utilizes marketing research techniques (conjoint analysis) to solicit and analyze public preferences and marginal rates of substitution (acceptable tradeoffs) with respect to the silvicultural treatments at the FERDA site. It also uses similar techniques to understand preferences and assess acceptable tradeoffs among broad-based goals such as enhanced timber growth, wildlife habitats, recreational opportunities, and cost. Research data will be analyzed using cluster analysis, discriminate analysis, and other statistical techniques to develop demographic profiles and explain differences in the preference structures for various groups of respondents. Investigators include : Don Dennis, Mark Twery, and Bruce Hansen of the USDA Forest Service, Northeastern Research Station, and Michael A. Rechlin, Paul Smith's College.

V. A Comparison of Silvicultural Systems in Northern Hardwoods.

The goals of this study are to: (1) demonstrate a variety of silvicultural systems to visitors at the Adirondack Visitor Interpretive Center, (2) test the effects of those silvicultural systems on composition, growth, and development of hardwood forest stands in the northern Adirondacks and (3) test the quality of prescriptions generated by NED forest management decision-support software (Twery et al. 2000). In this study the NED/SIPS software (Simpson et al. 1995) was used to generate preliminary marking guides to be followed in the treatments. The research will include an analysis of the timber volumes predicted to be cut with the actual volumes removed. Through regular inventories, the development of both the residual stand and new trees will be monitored over the next five to 25 years or longer. Results will be used to refine and enhance the NED prescription facility. These forest overstory data will be integrated with analyses of the other plants and animals being studied in the same areas. Interpretation of the treatment blocks to visitors will be updated and adapted as conditions change. Investigators include: Mark J. Twery and Gary L. Wade of the USDA Forest Service Northeastern Research Station, and Michael A. Rechlin, Paul Smith's College.

Interpretive Programs

The educational goal of FERDA is to interpret forestry as practiced on private lands within the Adirondack Park. Visitors will be able to walk to the site on their own or take a naturalist-guided walk throughout the area. Over the summer of 2000 interpretive signs are to be placed at each block to explain both the forestry practices and the ecological change resulting from those practices. These signs will be updated regularly as the research provides new insights into the changes taking place.

There will also be an introductory display in the VIC building. This display will be designed to increase visitor awareness of the importance of private lands and forest management to the regional economy and to maintaining the open space character of the Adirondack Park. It will also be the introduction that will encourage visitors to view the FERDA site. Visitor Center naturalist Mike Storey created the trailside panels and scripted the tour theme for FERDA guides. Tours of the site led by Paul Smith's College students are also available beginning in the summer of 2000. These tours are part of the research being conducted on human values and preferences in forest management practices. We expect that VIC volunteer naturalist-led tours of the site will continue beyond this summer season.

Future programming includes developing opportunities for student groups to learn about forest ecology by being part of the research effort. Ample opportunities exist for juniors and seniors from participating colleges and universities to conduct research projects on the area. Additional plans are being developed to create education/research modules for school groups visiting the VIC. This program will both give students a hands on learning experience and involve them in long-term data gathering on FERDA.

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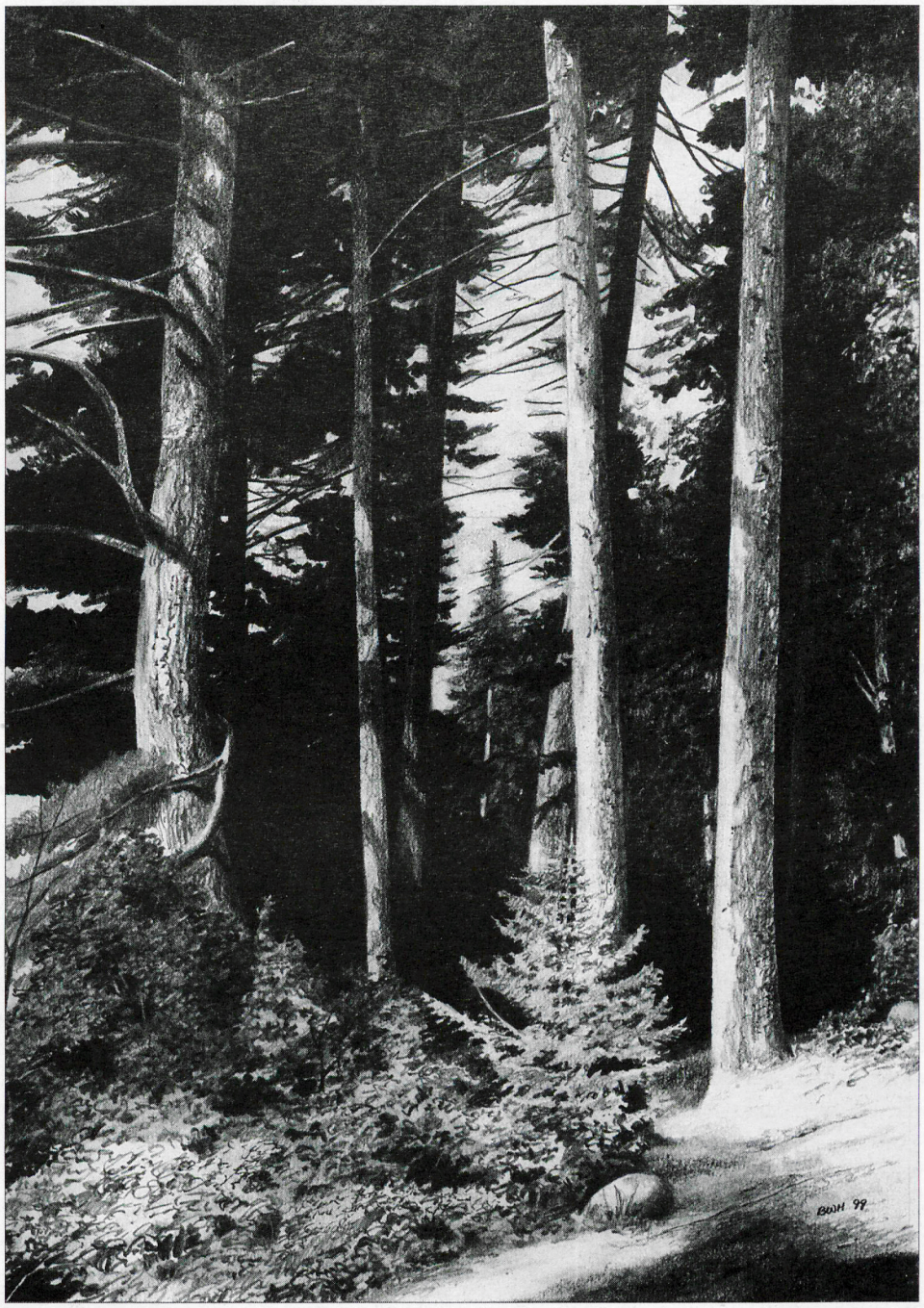

Born in the Summer. Drawing by Barry Hopkins.