

# **ECOSYSTEM-BASED MANAGEMENT ON MULTIPLE NIPF OWNERSHIPS**



**BOTH PROFESSIONAL FORESTERS and the general public are increasingly interested in an ecosystem-based approach to forest management. This emerging interest raises the question of how such an approach might apply in a landscape that is dominated by numerous nonindustrial private forest (NIPF) ownerships. This article reports on the results of a pilot study of a voluntary, incentive-based program in one town in western Massachusetts.**

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## Background

An ecosystem-based approach to management (EBAM) involves consideration of a forest beyond its actual property boundaries and the context in which it is located (Hornbeck and Swank 1992; Society of American Foresters 1993). It requires sensitivity to a larger landscape scale and to whether practices on a given property will have "ripple" effects on ecological processes beyond those boundaries. Ecological functions such as nutrient and hydrologic cycling, pollination, regeneration, and habitat use are not restricted by property boundaries. Just as foresters have been concerned about the downstream (off-property) effects of their practices on erosion and sedimentation, an EBAM calls for more sensitivity to other ecological patterns and processes (Gordon 1994).

Instead of focusing on one output such as timber, an ecosystem-based approach to management is concerned with desired future conditions in the forest. Outputs are generated as the forest is managed in the direction of these desired future conditions (Rowe 1992; Gordon 1994).

In concept, an EBAM is not difficult to apply when one or several public agencies own and control the ecosystem. But this approach can potentially be more complicated when the ecosystem is composed of hundreds of NIPF ownerships, as is typically the case in the northeastern United States (Brooks et al. 1993). Under these circumstances, myriad different ownership goals can complicate management at the ecosystem level (Irland 1994; Ticknor 1994).

Because of this disparity, successful application of an EBAM in the Northeast cannot depend on all landowners cooperating fully to create integrated desired future conditions across the landscape. The whims of human nature, a diversity of attitudes, and the independent spirit of landowners virtually guarantee less than 100 percent voluntary participation. And a regulatory approach is unlikely to succeed due to high implementation costs and the complicating

factor of landowner rights. This does not mean, however, that this approach is inappropriate or will fail. But an EBAM is most likely to succeed when landowner participation is encouraged through incentives and educational programs (Sample 1994).

Studies of NIPF owner attitudes suggest that wildlife, recreation, and aesthetics are their primary interests; timber management is not generally a high priority (Kingsley 1976; MacConnell and Archey 1982; Birch 1989). Concerns for wildlife, recreation, and aesthetics are not incompatible with an EBAM; in fact, they can be enhanced by such an approach. The

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challenge is to design incentive and educational programs that appeal to landowners and incorporate a sensitivity to ecosystem-level issues.

### Plainfield Pilot Project

Plainfield is a small, forested town in the western part of Massachusetts. It had a population of 571 in 1990 and covers 13,622 acres, of which 85 percent are forested (MISER 1994; MacConnell et al. 1991). Like many small towns in southern New England, it underwent significant growth in the 1980s, exemplified by a 10-year population growth of 34 percent and an increase in residential land use of 33 percent between 1971 and 1984 (MacConnell et al. 1991). Currently 266 landowners hold properties of 10 acres or more.

Four elements form the cornerposts

of this experiment to introduce a voluntary EBAM approach to a community:

- an existing program for NIPFs whose broad framework allows a diversity of landowner objectives (in this case the Massachusetts Forest Stewardship Program);
- a receptive community and local leadership (the Plainfield Conservation Commission);
- a university-supported natural resource training workshop for community conservation leaders (the Coverts Program, run by the Department of Forestry and Wildlife Management at the University of Massachusetts); and
- GIS as a tool for analyzing and displaying landscape values and information to the community.

Each of these elements was vital for the success of the Plainfield Project.

*Massachusetts Forest Stewardship Program.* This state-run program, funded by the USDA Forest Service, encourages private landowners to practice long-term guardianship of their woodlands and recognizes the wide range of ecological and social values of privately owned forests across the state. All 50 states have similar programs. The Massachusetts Department of Environmental Management runs this particular program.

Technical expertise and financial incentives motivate landowners to consider objectives and goals for their land and to translate these into specific actions with the help of private natural resource consultants. A standardized plan format—the entry point to the program—requires blending a detailed resource inventory and stand descriptions with landowner objectives. The product is a forest stewardship plan, which includes a 10-year schedule of stewardship activities. The forest stewardship plan also requires noting the regional context of the property, including local land-use patterns; the location

*Opposite: An aerial view of northwestern Massachusetts depicts the forest and agricultural landscape typical of Plainfield, site of a community stewardship project.*

of the property on its watershed; and the location of nearby lands that will remain forested. This landscape information was designed to focus the attention of landowners and resource professionals on resource concerns be-

yond property lines. The program pays 75 percent of the plan preparation cost, up to an established ceiling. The Forest Stewardship Program has been in full operation since 1992, and by the fall of 1995, 866 properties were participat-

ing, encompassing 78,770 acres.

Once a forest stewardship plan is approved, landowners are eligible for additional costsharing on practices to diversify habitat, attract wildlife, improve future timber stands, create trails, improve aesthetics, and stabilize soil erosion. Owners must comply with normal state and federal regulations related to forest cutting and wetlands, but are not legally bound by their forest stewardship plans.

*Local leadership.* A Plainfield landowner, who also served on the local conservation commission, started an informal program to make his neighbors aware of the threats of unplanned residential development to the scenic, ecological, and economic health of their town. He feared that rampant development would fragment habitat, ruin scenic vistas, and impair the ability of local dairy farmers to produce forage. This landowner, a resident for more than 15 years, had extensive prior experience and local credibility on land-use issues.

*Training community leaders.* On the strength of his leadership, this landowner was selected to participate in the Coverts Program, a statewide effort to enlist community leaders as advocates for forest stewardship (Snyder and Broderick 1992). Participants receive intensive training in forest ecology and management, wildlife biology, and communication skills. In return, they agree to become spokespersons for forest stewardship in their respective communities.

Inspired by this training, the Plainfield landowner collaborated with the Forest Stewardship Program coordinator. He sought to encourage fellow landowners to prepare their own forest stewardship plans and to consider cooperating with neighbors in a form of ecosystem-based management. A pilot program was designed that blended information/education and financial incentives.

*GIS as a landscape tool.* One important tool to assist landowners and natural resource professionals in understanding the role of an individual parcel in the greater forest ecosystem is

## Stewardship Neighborhood Opportunities

This is a list of activities that may be enhanced ecologically or economically when neighboring landowners agree to pursue them jointly.

Task	Possible benefit
<i>General management</i>	
Share plans	Opportunity to increase quality or value of activity
Share technical information (bulletins, brochures, a joint visit from a resource expert)	New ideas, insights
Hire the same forester/natural resource professional	Increased efficiency and job continuity; better value for cost
Hire the same logger	Increased efficiency and job continuity; better value for cost
Synchronize woods activities	Increased efficiency; improved economic viability of job; minimized impacts to forest
Share access roads, log landings, stream crossings	Reduced layout, construction, and materials costs; reduced cumulative environmental impact
Coordinate logging aesthetics	Increased value of effort
<i>Wildlife habitat</i>	
Locate habitat improvements relative to neighbors	Harmony of landscape habitat opportunities; minimized conflict of objectives
Assess forest for seedling, sapling/pole, and sawtimber size classes	Increased habitat diversity for all Massachusetts wildlife species
Retain corridors (riparian or mature forest)	Increased habitat value for wide-ranging species
<i>Wood production</i>	
Collaborate on marketing a low-volume product	Increased overall sale viability; reduced overhead costs to logger; better stumpage price; reduced environmental impact
Collaborate on marketing a specialty product	Increased overall sale viability; increased volume and economy of scale
<i>Recreation</i>	
Coordinate layout of recreational trails	Better quality (longer, more diverse) recreation experience

spatial information. Through the Resource Mapping Program at the University of Massachusetts, 1985 aerial photographs of Plainfield were interpreted for land-use classes. Forest was categorized as softwood, hardwood, or mixed; and seedling/sapling, pole, or sawtimber size classes. This intensive typing enables the landscape to be analyzed for wildlife habitat (Hunter 1990; DeGraaf et al. 1992). Photointerpretation was then digitized in a GIS environment. All property boundaries in Plainfield were also digitized to enable landowners to understand the role of their parcels in the greater landscape. Other information on hydrology, rare species habitat, and protected land (i.e., protected from development) depicted key natural resources in the community.

### The Implementation Phase

In the fall of 1994, the landowner and the Forest Stewardship Program coordinator organized two programs to make Plainfield citizens aware of community-wide stewardship. A slide show presentation, titled "Plainfield: From Satellite to Salamander," employed concepts of wildlife ecology to discuss the importance of resources at different scales. It featured GIS maps that depicted landscape values such as corridors and the diversity of forest structures. A second workshop described how to apply some of these landscape concepts to individual properties, through the Forest Stewardship Program and the pilot incentive project. The first program attracted 65 residents and the second 35.

In addition to the standard costsharing in a forest stewardship plan, a special costsharing incentive was devised for the Plainfield Project to encourage neighboring landowners to consider resource values beyond their properties and the possibilities for working together. Rather than devising a detailed plan for several abutting properties, stipulating what must be done, a less constraining approach was offered.

Three or more neighboring NIPF owners were eligible to participate as a

## Neighborhood Checklist for Foresters and Natural Resource Managers

- Carefully review each of the management plans to understand the objectives and scheduled activities that are planned for the next 10 years. Talk with landowners to learn about neighborhood projects they may specifically have in mind. With maps, aerial photos, and field checks as needed, get an understanding for the neighborhood properties as a whole.
- With the "Stewardship Neighborhood Opportunities" list in mind (see sidebar, opposite page), investigate possible joint actions that two or more landowners could take that appear to enhance the value of the activity. The consultant's job at this point is to make an inventory of possible opportunities that landowners may or may not pursue.
- Prepare a neighborhood checklist for each landowner. It should include:
  - a map showing all of the neighborhood properties in the context of roads and major streams (do not repeat the level of detail of maps contained in individual plans);
  - a sketch of neighborhood properties on a USGS topo sheet; and
  - a brief paragraph that (1) notes the general location of the properties on the landscape, (2) summarizes information from the *Regional Context* section of the Stewardship plans, and (3) states the total number of acres that comprise the neighborhood.
- In list form, suggest joint activities that landowners may consider in the upcoming 10-year (or longer) period. Note conditions that might be relevant to the activity such as weather, markets, etc. Below are some fictitious examples of how these suggestions might be written:
  - Example 1.* Building on internal trails on the property of the Silvers, Golds, Greens, and Browns, and with new trail segments created as linkages, make a grand loop trail that extends south along Bascom Ridge, east into the valley along Trout Brook, and passing by the glacial erratic on the Green property. A vista at point A on the Green property and at point B near the beaver pond would greatly enhance the trail. Discuss alternative spurs for hiking versus cross-country skiing designs.
  - Example 2.* Both the Golds' and the Greens' plans call for patch cuts to increase the supply of early successional forest habitat. By locating these two three-acre cuts in the vicinity of points G and H, the integrity of the wildlife corridor that extends from west to northeast across Bascom Ridge, and which contains mature forest, will optimally provide both the young forest growth that is a scarcity in this region and the values of large, contiguous mature forest that are also key.
  - Example 3.* The logging jobs that are scheduled for 1996 on the Silver and Green properties are situated such that they might share the same truck access road and landing area. If markets for the Silvers' oak and the Greens' pine are both relatively strong, these landowners may consider conducting the sales at the same time to reduce overhead costs to the logger and to capture a higher stumpage price. If sales are to occur at different times, it may be worthwhile to at least share the same access and landing area if the creation of additional landings is not desirable for wildlife or aesthetics.
  - Example 4.* The Browns are scheduled to do an improvement thinning in a small, low-quality hemlock-hardwood stand, contingent on finding a suitable operator who will tackle this marginal job. Consider having the firewood operator working on the Greens' hardwood stand do this work when he is there. The hemlock-hardwood stand is in a seasonally wet area, making the timing of this job less flexible than the hardwood stand.

Stewardship Neighborhood. When all participating properties had individual forest stewardship plans, additional costsharing was made available to fund development of a "checklist" of possibilities for cooperation among abutting owners at the ecosystem level. The checklist was prepared by one or more natural resource professionals after reviewing individual plans and properties. The landowners had to find a lead consultant to develop the work. Cost-sharing was set at a rate of 75 percent, not to exceed \$100 per property in the neighborhood cluster.

The format for the neighborhood checklist is intentionally simple and is merely a list of possibilities; landowners are not required to adopt the practices. The "Neighborhood Checklist" sidebar on page 27 shows the steps that a forester takes to complete this checklist, with several examples of management activities that might be listed therein.

The "Stewardship Neighborhood Opportunities" sidebar on page 26 provides a generic list of opportunities to cooperate across boundaries. The list was given to landowners and consultants to stimulate thinking about their properties. The possible benefits are not guaranteed, and they may or may not apply for any given project. However, the list enables landowners to think broadly, beyond their individual properties, and to consider ways that neighbors can benefit from joint planning. Cross-boundary cooperation possibilities include establishing recreational trail networks; siting habitat enhancement or protection projects to optimize the intended outcome; sharing access for timber sales to reduce costs and environmental impacts; and dovetailing timber sale schedules to achieve higher economies of scale and better stumpage prices.

## Results

Nine months have passed since the two presentations introduced Plainfield landowners to the EBAM and a program allowed them to put these ideas into action on their properties. Since then, two Stewardship Neighbor-

hoods have begun that involve eight landowner families, 457 contiguous acres, and three private consultants. These landowners have received a list of suggestions to pursue in cooperation with neighbors. Activities may be initiated this year or at any time in the future.

As in any pilot project, it is important to measure results in order to determine whether to expand the program. The chief criterion of success in the short term will be the number of neighborhoods, landowners, acres, and natural resource consultants involved; and whether a change in awareness or understanding of options has occurred. The long-term measure of success will be how many neighborhood checklists result in genuine cooperative activity.

## Questions and Issues

This pilot project involved one town. It was undertaken to test the feasibility of this approach in encouraging voluntary collaboration among abutting landowners. As the pilot unfolded, a number of unforeseen questions and issues arose. For example, what about landowners who own less than the 10 acres needed to receive costsharing for an individual forest stewardship plan? It is possible that a group of small ownerships could reach the critical acreage and then participate.

This pilot was pursued through landowners, although we invited foresters to workshops and sent them information on the project. Such an approach can result in an extra layer of coordination if several interested neighbors have different consultants. In one cluster, the landowner who initiated the Stewardship Neighborhood also persuaded the group to use his consultant for the development of the neighborhood checklist. Another approach could focus on consultants, urging them to approach the neighbors of their existing clients. This could streamline the neighborhood checklist process since the consultant might already be familiar with each of the plans and would contract future work.

Feedback from key landowner participants indicates that although the

workshops stimulated community interest in the concept and the project, followup by consultants has not been as eager and prompt as needed to build on landowner enthusiasm.

Ultimately, leadership by landowners is critical if cooperation is to occur. The Plainfield approach depends on landowner interest and a desire to participate, rather than on resource-defined priorities such as timber production targets or specific habitat improvement goals.

## Applications beyond Plainfield

It is not a new idea for consulting foresters to seek forest management business from the neighbors of existing clients. The pilot project being tested in Plainfield may help encourage this outreach elsewhere and make explicit the values of planning, managing, or at least coordinating a cluster of properties at one time. In the past, landowner cooperatives typically focused on jointly producing and marketing timber products. The EBAM approach is possibly more compatible with landowner interests in other forest benefits (e.g., wildlife habitat and outdoor recreation) that are best considered at a larger level than the individual property. This is especially true for a landscape in which the average NIPF ownership is 10 to 15 acres (Brooks et al. 1993).

In North Orange, a rural community 45 miles from Plainfield, the idea of a Stewardship Neighborhood arose independently among eight abutting landowners with more than 650 acres. In this case a consultant presented the idea, requesting financial assistance to coordinate and review plans. This consultant was granted the same costsharing amount for development of a neighborhood checklist as in the Plainfield Project, as long as at least one other professional from a different resource discipline provided input.

If this pilot proves worthwhile, a good method to spread use of this approach is to ask a local watershed association, land trust, or other resource-defined conservation group to sponsor and publicize the incentive mecha-

nism. It is critical that local communities drive the adoption and implementation of this concept.

The low level of response by consultants may be tied to a lack of markets for the area's low-quality wood and thus the marginal economics of working in this timber-poor area. Because stewardship may involve improvement work and noncommercial habitat or aesthetic operations, local solutions to poor markets must be found. When consultants are not available, service foresters or volunteers trained in a Coverts (or similar) Program might be able to complete the neighborhood checklist and help landowners pursue cooperative projects.

Is the EBAM approach effective at encouraging NIPF owners to manage or cooperate at the ecosystem level? At this point it is too early to say. Educating landowners about wildlife ecology and habitat requirements helps them understand how their forests fit into the greater landscape. We know that landowners generally appreciate wildlife and frequently list it as an important reason for owning land. Providing spatial information (GIS) enables owners to see how their parcels fit into the complicated jigsaw puzzle of the greater forest landscape.

The costsharing incentive to develop voluntary opportunities for collaboration imposes no obligations, nor does it remove any landowner rights. It merely opens the eyes of individuals to mutually beneficial possibilities beyond their property lines, and it becomes a catalyst for people to get to know their neighbors and think on a larger scale. We believe this approach of combining education, information, and incentives should be investigated as we attempt to encourage management of forested ecosystems in a landscape dominated by NIPF ownerships. **UOF**

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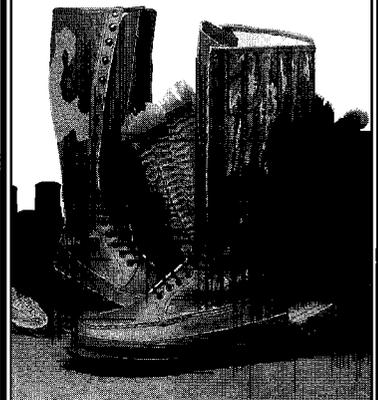
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