



# Ecosystem Management (EM) as a Basis for Forest Stewardship on Private Lands <sup>1</sup>

Michael Jacobson and Alan Long<sup>2</sup>

Concepts of forest management have steadily evolved through the 1900s. Over the last decade or more, the most significant shift in thinking and planning has been toward an "ecosystem-based" management approach. Most public land management agencies have adopted some form of ecosystem management (EM). Private forest industries, through their Sustainable Forestry Initiative (SFI), incorporated aspects of EM into their practices. In fact, today it is common to consider many forestry situations in the context of EM. Given all this activity in EM by public and industrial forest owners, how can nonindustrial private landowners apply EM on their forest land? To answer this question the paper first explains what EM means, and then provides examples of forest landowners incorporating aspects of EM on their lands.

## What is EM?

Simply stated, an ecosystem is a group of living things interacting with their environment. An ecosystem may encompass a small geographic area such as a pond, or it can be as large as a continent. Most commonly, when talking about ecosystems we

mean a relatively large, contiguous land unit such as a forest, landscape, or watershed. Herein lies one of the difficulties in defining EM (see Table 1 for a few definitions): what exactly are the boundaries of the ecosystem to be managed.

**Table 1.** Ecosystem Management Definitions.

"Ecosystem management focuses on the conditions of the ecosystem, with goals of maintaining soil productivity, gene conservation, biodiversity, landscape patterns, and the array of ecological processes." (Issued by the Society of American Foresters in 1993)
"Ecosystem management integrates scientific knowledge of ecological relationships within a complex sociopolitical and values framework toward the general goal of protecting native ecosystem integrity over the long run." (From an article in the Journal of Conservation Biology in 1994)
[continued, page 2]

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2. Michael Jacobson, former Assistant Professor, and Alan Long, Associate Professor, School of Forest Resources and Conservation, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 32611.

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**Table 1.** Ecosystem Management Definitions.

"Ecosystem management is an approach to the management of natural resources that strives to maintain or restore the sustainability of ecosystems and to provide present and future generations with a continuous flow of multiple benefits in a manner harmonious with ecosystem sustainability." (Stated by David Unger, the associate chief of the USDA Forest Service, in 1994)
"Ecosystem management is a resource management system designed to maintain or enhance ecosystem health and productivity while producing essential commodities and other values to meet human needs and desires within the limits of socially, biologically and economically acceptable risk." (Issued by the American Forest and Paper Association in 1994)

However, the term is not meant to have a precise definition but to express a management philosophy and approach. Therefore, as one might expect, the term EM can be interpreted many ways. Common themes embedded within most definitions are listed in Table 2.

**Table 2.** Common Themes Among the Definitions of Ecosystem Management (EM).

Focusing on long-term resource sustainability
Maintaining and enhancing biodiversity
Thinking in broad spatial and temporal scales
Integrating economics, sociology, and ecological systems in planning
Adapting management plans in response to monitoring and new scientific information
Recognizing the complexity and interconnections of "ecosystems"
Recognizing that humans are part of an ecosystem

For a private forest landowner EM means that one tries to balance ecological, economic and social aspects in his/her forest management. For example, one would not compromise the ecological integrity of the forest and its capability to provide wildlife habitat or clean water in order to maximize profits. In some forest situations social aspects such as community involvement and awareness may be important management considerations. Also, humans live in forest ecosystems and a stable, strong economy can

go hand in hand with a sustainable ecosystem. A good steward of the land views both economic returns from the land and sustaining ecological health as important management considerations.

Incorporating EM principles into land management is a process that must evolve over time. Part of the complexity is due to the scientific discrepancies about what comprises an EM plan. Even at the small individual forest unit (a stand) we are still learning about the effect of different management practices on forest ecological processes and species. Given our limited knowledge at the stand level, how are we expected to plan for cumulative effects at the larger landscape level? A famous ecologist once said that ecosystems are not only more complex than we think -- they are more complex than we *can* think. Therefore, perhaps the most important aspect of EM is to view it as a learning process, where landowners and forest managers adapt their plans to changing information. Landowners should set clear goals about what they would like to achieve, and be flexible in addressing changing information and needs.

### Is EM New?

The term EM has been in the scientific literature since the 1930s when it was recognized that we needed to protect ecosystems as well as individual species. Early examples of EM efforts occurred in the Greater Yellowstone Basin and around the Great Lakes.

In forestry, EM has evolved as a result of new knowledge about forest ecology and the emerging needs of society for a broader management context. To illustrate, in the 1800s forests were considered an obstacle to agricultural development. Early in the 1900s, forests were viewed more broadly as a source of commodities to spur industrial development. Later, this view broadened to include multiple uses of forests, including recreation, water, wildlife, and special forest products. EM builds on these past practices but focuses on sustaining ecological and biological elements of the forest while simultaneously sustaining the production of commodities and other resource values for society's use.

EM represents a shift in thinking and a response to social and political changes, and can be considered a new way of managing forests. But many of the techniques used in EM are not new. Multiple-use forest management (the objective being to simultaneously manage for timber and other attributes such as water and wildlife) has been a formal policy of public lands since the 1960s. Even before that, forests had been managed for uses other than timber. The first National Forests were established primarily to protect water resources and long-term timber supply. In fact, some landowners have been practicing EM all along--they just did not call it that. Careful harvest of timber products, consideration of watershed and wildlife protection, cooperative relationships with neighbors and forest managers, and long-term planning (all considered tools of ecosystem management) have been around for a long time. These practices have as a common goal the production of a healthy forest condition.

If foresters and private landowners have been carrying out aspects of EM, why the need for change? Change occurs as we learn more about how forests function and as society's objectives change. Traditional forestry is not to be abandoned, but the science of forest management is evolving to meet the expanding needs of society. Several factors discussed in the next section further explain aspects of EM that differentiate it from traditional forestry management.

## **Considerations for Applying EM**

### **Taking a landscape perspective**

Foresters generally think about a forest as a collection of individual stands. This is suitable for prescribing timber harvests and regeneration plans. However, many attributes of a forest such as wildlife and water quality are components of the larger landscape, not just one forest stand. Managing at the forest or landscape level allows one to consider the complexities and linkages among the various attributes, ecological communities, and stands.

### **Cooperation across ownerships**

If taking a "big picture" view or landscape approach is central to EM, then individual landowners will be encouraged to be aware of the

effect of their individual management objectives on the larger landscape. In some instances this may involve cooperation with neighbors. For example, cooperation may be valuable for management of environmentally sensitive areas or to manage for a specific habitat of a species that cuts across multiple ownerships. Cooperation may be formal or informal and may involve multiple parties or owners.

### **Taking a longer view**

Managers, owners, and society as a whole must have a long-term perspective with respect to forestry. Creating desired landscapes may take many years. Rotation ages for certain species or stands may be lengthened to address wildlife or ecological issues.

### **Property rights and landowner sovereignty**

EM is not intended to impose management restrictions on private forest landowners, or force them to mimic the way the USDA Forest Service manages their land. Private landowners have the right to manage their land as they wish, within the range of applicable laws and guidelines such as the Florida Silvicultural Best Management Practices (BMPs). Taking an EM approach may encourage the adoption of practices different than those currently used. Any decision by the landowner to practice EM, however, should be voluntary and nonregulatory.

## **Examples of EM Practices**

### **Using fire to restore longleaf pine forests**

Longleaf pines once dominated the landscape in the Southeast. The species distribution has been substantially reduced by conversion to agriculture and other land uses, and to some extent by the suppression of forest fires. Fire was an essential element in most original Florida forest ecosystems. Each ecosystem contained particular combinations of plant and animal species adapted to the regular occurrence of fire. Today, many private landowners manage fire to restore longleaf pine or maintain other forest ecosystems. Prescribed burning is a major factor in maintaining the ecological condition of their forest and the amenities it provides, such as wildlife habitat and timber production.

### **Leaving buffer zones to protect water quality**

Forests along rivers, streams and in wetlands provide a number of valuable goods and services. Management of these riparian forests in Florida includes the use of BMPs to help protect this valuable resource. The BMPs address ways to prevent water quality degradation from forestry operations and to protect wildlife. BMPs include leaving a buffer zone of trees along watercourses, and maintaining water flow in natural channels. Rivers and streams that cross property boundaries are some of the most likely examples of EM in Florida today. As adjacent landowners follow BMPs and leave natural cover in the streamside zones they protect and maintain ecosystems across boundaries.

### **Harvesting techniques to enhance forest productivity and provide critical wildlife habitat**

Harvesting methods that mimic natural occurrences such as fire, wind, and other disturbances promote diversity in the forest and provide a landscape mosaic of stand sizes and ages. Tools to achieve diversity within stands include managing timber under an uneven-aged system, selective cutting of stands, extending rotation ages, retaining more down wood, snags, and den trees. Landscape diversity is enhanced by reducing clear cut size, separating the areas to be cut, and reserving areas from logging. These tools may not work in every situation, but they allow landowners to grow and harvest timber as well as accommodate desired ecological values.

## **Getting Started with EM**

Landowners can initiate the process of EM through mechanisms ranging from individual efforts to collaborative partnerships and landowner associations.

### **Individual initiatives**

Private landowners may have already begun practicing EM if their management plans and practices include multiple objectives and long-term sustainability of their forest landscapes. If not at this

point, landowners can begin considering how their management practices fit into the broader landscape, and can revise or prepare their management plans to include the types of considerations and practices previously mentioned. Assistance with management plans can be obtained by contacting consulting foresters or Division of Forestry County Foresters. Information available through your county Cooperative Extension office includes publications such as "Environmentally Sound Forest Harvesting", "Forest Resource Information Available on the Internet," and "Forest Regeneration Methods."

### **Collaborative partnerships**

A number of public/private partnerships are implementing EM in the United States. These partnerships are usually administered by government agencies, large landowners, environmental groups such as The Nature Conservancy, or land trusts. Collaboration between public and private landowners is occurring around the country and is driven by issues such as protecting unique habitats or endangered species. Partnership efforts may include private landowners.

### **Stewardship through volunteering**

Studies have found that friends and neighbors play an influential role in the management behavior of private landowners. A number of states are developing programs that train volunteers in stewardship principles. The volunteers then promote awareness of forest stewardship in their communities through classroom and field training, and informal contacts with their friends, neighbors and community groups. The landowners use their knowledge in a number of ways, such as developing an EM plan for their lands and using that for demonstration. This neighbor-to-neighbor approach is helping develop community involvement and understanding, and is enhancing landscape management objectives so essential to the EM process.

### **Forming landowner associations**

The Florida Forestry Association is currently assisting in forming grassroots landowner associations at the county level for landowners to meet and share information. Such associations should

facilitate the exchange of ideas among landowners and promote improved forest management.

## Summary

Forest management has changed in the past and continues to evolve as new tools and techniques become available. Ecosystem management, one of these tools, represents a way of thinking about managing forest land that addresses economic, ecological and social aspects. It provides a framework for reaching the goal of forest stewardship and management for multiple attributes and objectives. EM leads the landowner to think about how their land fits in the larger landscape, and incorporates any practices that landowners already carry out. EM is a voluntary approach that should not impose on landowners' private property rights.