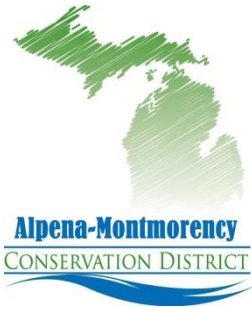


ECOSYSTEM MANAGEMENT

FOREST STEWARDSHIP MANAGEMENT NOTE #36



"People need to understand that the choice between people and animals, between the economy and endangered species, is a false one. There is no choice. Our fate is inexorably linked to the state of the ecosystems that make up the global environment in which we live."

- Mollie Beattie, 1993

Director of the U.S. Fish and Wildlife Service

WHAT ARE ECOSYSTEMS?

Conceptually, an ecosystem may consist of any relatively distinct collection of living and non-living things that is viewed in terms of the interactions among the components and the properties of the system as a whole. Thus, ecosystems can range in size from microscopic to global, and may be nested among one another. The ecosystems of most interest to woodland managers are ecological communities, which are typically defined as stands or management units of 1-100 acres or so, and landscapes, which are typically defined as watersheds of many square miles and that include both forested and non-forested areas (#3,6, FSMN #39).

WHAT IS THE ECOSYSTEM MANAGEMENT PERSPECTIVE?

1. **FOREST HEALTH** - Ecosystem management is a new, and rapidly evolving, philosophy of land management that focuses on the condition of the forest as a whole. It attempts to maintain the complex processes, pathways and interdependencies of forest ecosystems and keep them functioning well. Ecosystem management focuses on the health of the land in order to provide resilience to short-term stress, such as pests, and adaptation to long-term trends, such as global climate change (#6). In short, ecosystem management represents a more natural, lighter-on-the-land approach.
2. **MIX OF VALUES** - The goals of this approach include maintenance of soil productivity and native biodiversity (FSMN #37), watershed protection, and restoration of natural landscape patterns (FSMN #39). Rather than maximizing production of individual resources, ecosystem management expands the traditional meaning of sustained yield by producing a mix of values, while minimizing adverse effects (#6).
3. **HUMAN NEEDS** - Ecosystem management also sees humans as part of the ecosystem, including intensive management systems. Thus, cultural traditions must be maintained and society's needs for consumptive and non-consumptive uses of the forest must be met. Conflict among competing interests are resolved by focusing on the desired future condition of the land rather than on outputs of resources. The idea is that both commodity and amenity interests will be better served in the long-run if the health of the forest is maintained (#6).

WHY IS ECOSYSTEM MANAGEMENT IMPORTANT?

1. **CONFLICT AVOIDANCE** - The multiple-use land management philosophy, which dominated the field of forest management from the 1960's through the 1980's focuses on the joint production of commodities, such as timber, and amenities, such as recreational opportunities. Although the multiple-use approach has been successful at times, its emphasis on resource production has heightened conflict among competing interest groups.
2. **ETHICS** - As a result of recent advances in forest ecology and growing signs of forest degradation, many foresters and landowners now recognize that they have an ethical responsibility for the long-term health of the land (FSMN #35).

SUGGESTIONS FOR ECOSYSTEM MANAGEMENT OF PRIVATE WOODLANDS

1. **ADOPT AN ATTITUDE OF ADAPTIVE MANAGEMENT** - Ecosystems are very complex and somewhat unpredictable, and ecosystem management concepts are largely untested. Consequently, ecosystem management must be an adaptive process in which new ideas are constantly being tried, evaluated and modified. An attitude of experimentation is needed.
2. **MAINTAIN ECOSYSTEM COMPLEXITY** - Natural forests are far more complex than once imagined in terms of their composition, structure, and function (#2). To maintain ecosystem health in managed forests, attention should be given to maintaining at least a moderate degree of complexity or diversity.

COMPOSITIONAL COMPLEXITY (species diversity) can be achieved by favoring less common species when conducting plantings (FSMN #7-9,25,27) and when harvesting timber (FSMN #16,17,19,20) and by maintaining stands of varying age, especially areas of regeneration and areas of old growth.

STRUCTURAL COMPLEXITY in the horizontal dimension (e.g., stand age diversity) can be achieved by harvesting different areas at different times and by extending the harvest age of some areas to provide valuable old growth habitat (FSMN #38,41). Structural complexity in the vertical dimension (e.g., vegetation stratification) can be achieved by using uneven-age timber harvesting methods (FSMN #17) and by designating old growth areas. Maintaining abundant snags, cavity trees, and down trees is an effective means of maintaining several types of complexity (FSMN #28).

3. **ECOSYSTEM RECOVERY OF CLEARCUTS** - Most forests that have been destroyed by natural catastrophes recover quickly because they contain "biological legacies", patches of live trees and dead organic matter harboring many organisms that can recolonize the area. Thus, recovery of clearcut areas can be facilitated by leaving scattered patches of large living trees, many snags, and abundant down logs of large diameter (#2, FSMN #17,28).

4. LANDSCAPE LEVEL MANAGEMENT

LANDSCAPE ECOLOGY - Landscape ecology is an applied science that, among other things, is concerned with how the spatial distribution of vegetation across whole landscapes affects wildlife populations, water resources, and other ecosystem properties (FSMN #39). These effects can be large.

For example, the fragmentation of forests into small patches in agricultural regions, has resulted in: 1) drastic declines of bird species that require large tracts of woodland, and 2) overpopulations of white-tailed deer, which thrive in edge habitats (FSMN #25,42). To some extent, this problem can be controlled with "minimum-fragmentation" cutting patterns, in which the time and location of timber harvests are selected to maintain large blocks of mature forest. However, most private woodland owners do not control enough land to use such a scheme.

COOPERATIVE MANAGEMENT - While the scientific principles of ecosystem management are new and largely untested, a more serious barrier to success application of the concept is the need to coordinate management practices across mixed ownerships (#8). If management is to be conducted at the landscape level, federal, state, industrial, and private landowners will have to cooperate (#9).

Some observers believe that efforts in this direction are undesirable as they will result in restrictive regulations, more centralized control, and erosion of private property rights (#5). Others, however, see it as an opportunity for private landowners to work together to solve problems associated with managing small acreages for timber, wildlife, and recreation (#4).

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FSMN #'s refer to other Forest Stewardship Management Notes in this series.

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