

Managing the Natural Forest

Information to help you to meet your long-term goals and objectives while maintaining the long-term health and productivity of your woodlot

Here in the Acadian Forest, it's natural for many sites to grow different species of trees of different ages and heights. In uneven-aged management, trees are harvested individually or in small groups, allowing you to manage the natural forest by imitating the common small-scale natural disturbances—wind, insects, disease, lightning strikes, natural mortality, and so on—that are characteristic of these sites.

Managing the natural forest is a key principle in *ecosystem-based forest management* (EBFM), an approach to forest management that is relatively new in Nova Scotia. Mimicking natural processes, including natural disturbances, is another key principle in EBFM.

EBFM can be very helpful to woodlot owners who want to practice uneven-aged management. It also fits well with the Category 7 Quality Improvement Silviculture Treatments—selection management, crop tree pruning, and crop tree release. (These are discussed in the handout titled “Growing High-Value Trees”.)

EBFM will help you answer questions such as, What could my woodlot become with my help? Which goals are achievable or best suited to my particular site? What is the best way to achieve goals and objectives while maintaining and enhancing my woodlot's long-term health? Can I make an income from my woodlot while also pursuing other goals?

What is an ecosystem?

An ecosystem is a community of interacting organisms. Ecosystems generally have similar site conditions (e.g., soil, climate, moisture). The species in a particular ecosystem are all adapted to these shared environmental conditions.

Ecosystems vary from one place to another because of differences in physical characteristics such as soils, terrain, and elevation and biological characteristics such as plants and animals. They can be very large or relatively small. They usually overlap and are interconnected or are dependent on one another through various natural processes, such as the water cycle. Our Acadian Forest is a large ecosystem that is composed of many different ecosystems.

What is ecosystem-based forest management?

In EBFM, a woodlot owner or other forest manager uses information about the ecosystem or ecosystems present in a particular forest unit to determine the natural processes that should be or are occurring on the site. The manager then tries to protect and maintain these processes while also achieving other goals. These goals may include not only timber production but also values such as conservation, recreation, wildlife, and beauty.

Why is it important to understand natural processes?

Information about the natural processes in a forest unit helps us to understand the full potential of this unit and also hazards associated with working in it. This enables us to manage the natural forest while

The key principles of ecosystem-based forest management are:

- ∞ Manage the natural forest.
- ∞ Mimic natural processes, including natural disturbances.
- ∞ Maintain multiple forest values, benefits, and uses.
- ∞ Prescribe site-specific treatments.
- ∞ Focus efforts where they will yield the best returns.
- ∞ Improve the quality and value of individual trees over time.
- ∞ Avoid predictable hazards.
- ∞ Maintain and protect long-term site productivity.
- ∞ Maintain and protect ecosystem functions and health.

maintaining multiple forest values, long-term site productivity, and most importantly, ecosystem health. By tailoring harvest practices to reflect what naturally occurs in the forest—and making sure that activities are undertaken during the appropriate times of the year—we are able to avoid negative effects on the forest ecosystem.

What tools are available to help me practice ecosystem-based forest management?

The Nova Scotia Department of Natural Resources (NSDNR) has developed a manual to help you make management decisions based on an understanding of the ecosystems present on your property.

How will the Forest Ecosystem Classification manual help me manage my site?

NSDNR's Forest Ecosystem Classification (FEC) manual contains photographs, keys, and other tools to help you identify soil and vegetation types present on a particular site. These are linked to management interpretations that will help you make ecosystem-based management decisions.

For example, soil types are an indicator of possible hazards, such as compaction and rutting. Once you have determined what soil type is present on your site, the FEC manual will tell you what hazards are associated with that soil type.

For each vegetation type, the FEC manual provides information about natural processes at work on the site—for example, the most common types of natural disturbances, the tree species most suitable for the site, the potential for natural regeneration, and the risk of competition from undesirable species.

The FEC manual can also be used to determine what *ecotype* your site is in. Ecotypes are broad groupings of ecosystems that are characterized by similar soil types and by vegetation types that grow naturally on those soils. Based on ecotype, the FEC manual can give you a general indication of how much merchantable timber a site may be able to produce.

Taken together, information and interpretations from the FEC manuals can be used to develop management recommendations and conduct on-the-ground operations that will limit possible damage from harvesting, allow the site to be managed to its full commercial potential, and help to maintain both overall ecosystem health and site productivity for the long term. By allowing you to manage the natural forest, the ecosystem-based approach can also help you manage for non-economic goals. The last page of this handout gives an example of how this approach might be applied on a specific woodlot.

Where can I get more information?

An FEC manual for most of the central region of Nova Scotia can be purchased from the Nova Forest Alliance (902-639-2921). A manual for the entire province will be available in mid-2010. Information on forest ecosystem classification can be purchased or downloaded from the NSDNR website, <http://www.gov.ns.ca/natr/forestry/ecological/forest-class.asp>

How can I find out what soil & vegetation types are present on my site?

Soil types are classified by moisture (wet, moist, fresh or dry), texture (coarse, medium, fine) and sometimes fertility (poor, medium, rich). To determine soil type, dig a small hole in the ground (a soil pit) at least 12 to 16 inches deep. The FEC manual contains explanations, photographs, and a key to help you interpret what you see in the soil pit.

Vegetation types are described in terms of the tree species that are dominant in the top layers of the forest (the overstory) and plants that are predominant on the lower levels (the understory). A forest inventory can be very helpful in finding out what trees are on your site. Pictures in the FEC manual or in field guides can help you identify both overstory and understory vegetation. You can also look in the FEC manual to see what vegetation types are usually found on this soil type.

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Case history: Using Forest Ecosystem Classification to manage a woodlot

S imagine a 10-hectare stand of 40-year-old poplar, Balsam fir, Red maple, Red spruce, and White pine. The site contains a lot of Red maple, Balsam fir and poplar, but about 30% is other species—in other words, a typical Nova Scotia woodlot. How would you make management decisions for this site using an ecosystem-based approach?

First you would walk through the stand to get a general feel for what's there. Then you would dig a soil pit. Using keys in the FEC manual, you would determine what soil type you are dealing with.

Let's say you are dealing with ST2—Fresh-MCT. (*ST* stands for "Soil Type", and *MCT* stands for "medium to coarse-textured"). Management interpretations at the bottom of the ST2 page in the FEC manual tell you that ST2 has a high risk of forest floor loss. In other words, this soil could lose the nutrients needed to support the growth of new trees. It also could become very dry.

Your next step is to identify vegetation types. You already know what trees are in the overstory. Using the manual or a field guide, you find understory vegetation consisting of wood aster, wild lily of the valley, evergreen wood fern, and some blue-beaded lily. In the FEC manual, these plants correspond to VT24—Aspen, Honeysuckle-Wood aster. (*VT* stands for "Vegetation Type".)

Management interpretations for VT24 state that seedlings of desirable species are not likely to regenerate naturally after an area been entirely or mostly harvested. Instead, the site is likely to be taken over by less desirable trees and shrubs that do well in full sun.

Based on your own experience and/or other reading, you know that the type of soil found on this site is at especially high risk if the area becomes fully exposed to the sun (that is, heat) and/or if water runoff dramatically increases. The best way to prevent this is by maintaining at least partial shade on this site. Shade is also necessary if you want to encourage regeneration of desirable species. You conclude that it is crucial to maintain shade on this site. This will help you to avoid predictable hazards.

You can also use the FEC manuals to help you set management goals for your site. For example, the manual states that a VT24 site has the potential to eventually become VT9—Red spruce-Hemlock, Starflower. A site with Vegetation Type 9 and Soil Type 2 would be in Ecotype 5, which has the capacity to grow valuable, long-lived conifers, including Red spruce.

Like other long-lived Acadian Forest trees, Red spruce grows well in shade. Although there are few Red spruce left in the stand at present, there are enough to serve as seed sources. Knowing this, you might choose a long-term goal of managing this stand for regeneration of Red spruce. You could also encourage other high-value species, such as White pine, that are characteristic of Ecotype 5. Eventually, you can hope to develop this site into an uneven-aged, multi-species woodland suitable for selection harvesting, in which high-value trees are harvested individually or in small groups. With its many tall, old trees and healthy ecosystem, this woodlot will provide many non-economic benefits and will be suitable for a wide range of uses.

What about the short term? One option would be to apply a treatment called crop-tree release (CTR), in which less desirable trees are felled (but not necessarily removed) in order to encourage growth and quality improvement of more valuable trees. CTR can be used to improve the growth and quality of existing Red spruce, White pine, single-stem Red maple, better quality Balsam fir, and even single-stem poplar. As long as you do not remove too much shade from the site—and retain trees needed as seed sources—this treatment may allow you to derive income from your woodlot while you also pursue your long-term goals.

This case history shows how EBFM can be used to help you your woodlot to achieve its full potential. By working with natural processes, you have protected the site from harm and helped to ensure its long-term productivity.