



Restoring mixed-pine forest ecosystems in Upper Michigan

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Across the northern Lake States, fire-maintained forests dominated by eastern white pine, red pine, and jack pine were common features of the pre-European settlement landscape. These forests were important natural and cultural resources, providing high-quality habitat for many species (including many species of migratory songbirds), areas for hunting and berry gathering that supported many Native American communities, and the timber needed for late 19th century industrial and urban development.

Over the past century logging, catastrophic wildfires, and subsequent fire suppression have changed these forests dramatically, leading to an increase in jack pine and fire-sensitive hardwoods, including aspens and oaks. While a variety of factors including climate, topography, soils, and fire regulated the distribution of these species on the pre-European settlement landscape, stem densities in many areas are now more than twice as high when compared with pre-European conditions. The result has been significant accumulations of fuels, especially in Upper Michigan, which under the right conditions pose a serious threat to local communities.

Goals & Objectives

The goal of this project is to develop management recommendations for reducing fuel loadings and fire hazards that at the same time meet ecological restoration objectives in mixed-pine forest ecosystems of Upper Michigan. To accomplish this, we are:

- 1.) Developing a better understanding of the pre-European settlement and post-settlement fire regimes and their influences on fuel loadings and forest composition and structure ;
- 2.) Analyzing current fire hazard and forest management planning efforts of the different agencies responsible for the stewardship of mixed-pine forest ecosystems in an effort to develop a decision-aiding model for fire risk management;
- 3.) Organizing workshops that catalyze discussion of the current status of mixed-pine forest ecosystems in eastern Upper Michigan among different agencies and lead to the development of restoration-based fuel-reduction recommendations for mixed-pine forest ecosystems.

What is Restoration-Based Fuel Reduction?

Many of the fuel-reduction treatments that are being considered by many state and federal agencies are compatible with ecological restoration goals – *defined here as the guided recovery of natural ecosystem composition, structure, and function*. In fact, many forest management and silvicultural options utilized in mixed-pine management attempt to emulate natural disturbance processes such as fire. The goal is to develop conditions or outcomes in managed forests that are similar to those observed in forests that have not been dramatically impacted by humans. We believe it is possible to focus on both issues, especially if restoration decisions are adaptive and balance the imposed short-term risks (such as those associated with prescribed fires and smoke) with long-range benefits (such as biodiversity or reducing the likelihood of catastrophic fire).

Research Activities

To date, our efforts have been focused at the Seney National Wildlife Refuge, sampling a network of sites representing different fire histories across the Refuge. We are currently developing a detailed fire history of the Refuge and analyzing how fire has shaped the composition and structure of mixed-pine forest ecosystems at the Refuge. In 2007 we will expand our sampling efforts to include other areas in eastern Upper Michigan, including the Two-Hearted River Forest Preserve and McMahan Lake Preserve, both owned by The Nature Conservancy. We will also begin to examine how different federal and state agencies plan and manage fire risks within an ecological restoration framework.

In 2008 we plan to host a meeting and workshop at the Seney National Wildlife Refuge to share and discuss our findings with scientists, resource managers and forest landowners. We also plan to develop a guide for restoring mixed-pine forest ecosystems in Upper Michigan that utilizes silvicultural options in conjunction with prescribed fire to emulate the outcomes of natural fire in managed mixed-pine forest ecosystems with a particular emphasis on reducing forest fuels.

For more information, please see: <http://www.pinerestoration.org/>



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