

# An Old-Growth Program for St. Lawrence County

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## Abstract

*St. Lawrence University students and staff started an old-growth program focusing on St. Lawrence County. The intent of the program is to gather field data about old-growth forests in the county that can be used to establish a viable forested landscape. The methodology includes stand evaluations and a scoring system that identifies high quality old-growth stands that can be targeted for preservation. In addition, mapping these stands facilitates efforts for the creation of a network of interconnected forest blocks for enhanced conservation on this fragmented landscape. The program also seeks to work collaboratively with public agencies and private landowners.*

## Introduction

The old-growth program for St. Lawrence County (SLC) started as a hunch. Most old-growth forests in upstate New York are assumed to be located in the Adirondack State Park. We suspected, however, that some remnant stands remain outside of the Park in SLC. These remnant stands would have had to survive the era of peak deforestation between 1850 and 1880. Since no data base is known to exist to help us with this matter, we decided to construct a program with a methodology appropriate for this area and consistent with our mission.

The mission of the SLC old-growth program is to enhance conservation efforts in the county by establishing a landscape of connected old-growth preserves. Old-growth stands could be connected through corridors of extended

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rotation forests to increase the functionality of the landscape allowing plant and animal species to migrate.

To accomplish these goals we retooled a methodology developed by the Minnesota Department of Natural Resources' old-growth program (see MNDNR 2002) to develop an old-growth accounting methodology appropriate for SLC. The evaluation methodology we developed is designed to assess the quality of old-growth stands. This information is being used to build an old-growth

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forest data base for SLC, to eventually assess the potential of an old-growth network in the county, and to disseminate this information to the public via a website. The program also serves educational purposes. St. Lawrence University students learn forestry field methods and are engaged in a public sector work program with public agencies and private landowners.

## Methodology

Candidate stands are identified by literature review, anecdotal accounts, and by request in the case of private lands. The evaluation methodology we developed is intended to determine the ecological and social significance of a stand and to develop a rubric to help determine if the stands satisfy our old-growth characteristics. The data gathered in this inventory are used to rank stands according to their old-growth quality.

To begin, we had to define what old-growth is for SLC and for our purposes. According to Leverett (1996), several approaches to old-growth definitions are commonly used. Some stress the importance of tree age, others the degree of human disturbance. Some focus on the successional stage and/or development of the stand at each successional stage, while others focus on economic criteria such as the age at which a stand's capacity to produce timber diminishes. We constructed a definition that allowed us to achieve our objectives. While this process may appear arbitrary and subjective, it is in fact necessary to take area-specific criteria into account including historical land-use practices and regional ecological conditions. The U.S. Forest Service supports such an approach (Forest Service 1998). We also include sociocultural considerations that are part of the appeal of old-growth stands.

The primary factors used to determine the ecological quality of an old-growth stand are

- stand age,
- degree of human disturbance,
- size and context of the stand, and
- structural characteristics of the stand.

The minimum requirements for a stand to be considered for evaluation are:

1. Trees at least 160 years old are evenly dispersed throughout the stand, representing a forest that survived the period of intense logging in the county.
2. Stand size is at least five acres, representing a minimum size that can serve as a seed bed for adjacent forests.

A robust and logical methodology is crucial because the information has to be considered credible in order to achieve the intended conservation goals. The implications of this methodology, and of adopting a definition of old-growth,



“cannot be overstated. Its results can determine decisions on what areas of a forest are open to logging” (Leverett 1996). Our definition must also be specific to our purposes so that we ensure the longevity of this program and the continued preservation of old-growth forest stands in SLC. In short, our definition deliberately allows for identification of existing old forests and potential future old growth—the old-growth of future generations. These lesser quality stands can then be compared to their higher quality counterparts.

The evaluation process consists of office work and field work. To begin, as much stand information as possible is gathered from existing sources, published and anecdotal. An aerial map is created that includes roads and trail GIS layers. Stand boundaries are drawn on the map noting significant wetlands and inclusions of non-old-growth forest types. The size of the stand is then calculated using GIS software.

The number of evaluation plots taken in the field is determined by the size of the old-growth stand. Generally, at least ten plots are taken unless the stand is less than 20 acres in size. Plots are distributed evenly throughout the stand so that all portions of the stand are sampled and the inherent diversity of the stand is captured. Plots are  $\frac{1}{15}$  of an acre in size (30.4 ft. radius). All trees over four inch diameter at breast height (dbh) are tallied. All snags, logs, and stumps are measured, and regeneration rates noted. The largest tree in the plot is cored to determine its age. If a full core is impossible, an estimate is made by calculating the growth rate per inch. Other features, such as crown class and physiographic class, are also noted.

This methodology allows us to assess the primary ecological factors listed above. Since many old-growth stands are multi-aged, it is necessary to determine the age of some of the oldest trees as well as the age of trees of the dominant size class. The size and context of the stand is determined from aerial photographs and field assessment. Evidence of roads

and trails is taken into account, but logging is the primary type of human disturbance we are concerned with. Logging history is assessed based on the presence of cut stumps in the stand and by the size-class distribution of canopy

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Since cut stumps in areas that were logged long ago may have decayed beyond recognition, tree size class distribution is a key element in determining the stand history. Structural characteristics of the stand, such as large trees and snags, which play important roles in nutrient cycling and wildlife habitat, are also sampled within each plot.

Specifically, nine criteria are scored (Table 1). Stands with trees over 225 years old receive 20 points; younger stands receive progressively fewer points. *Cut stumps* are a sign of significant human disturbance and deterioration of forest integrity and are therefore scored out of 20 points as well. *Roads and trails* are also an indicator of human disturbance, but generally the disturbance is more localized so we apportioned 15 points to this category. *Size/context* refers to the size of the old-growth stand in

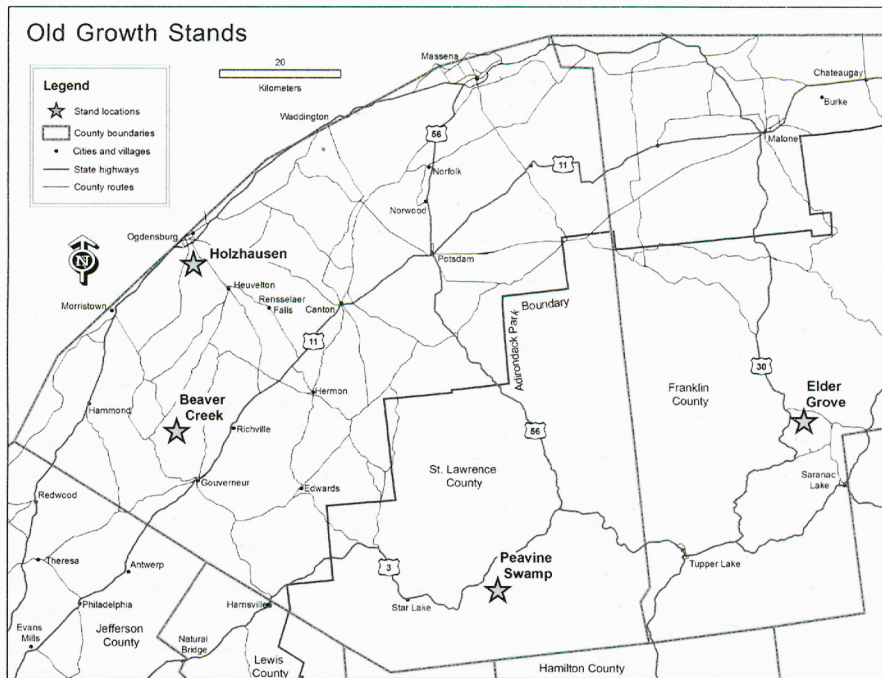
relation to its larger forest block. Since forest blocks and old-growth stands are relatively small in SLC, this category is not weighted as high as age and human disturbance. *Snags and logs*, important old-growth indicators, are scored according to their extent, number, and size. Due to their ecological and old-growth importance, these are also heavily weighted with 15 points.

*Subjective* points are derived by the evaluators and decided upon by consensus. The intent of this category is to allot a significant amount of points to old-growth qualities, such as evidence of vernal flowers, lichens, or the uniqueness of the stand in relation to its surroundings, that are not captured in the other standard categories. Ten points are possible in this category. Points are also given to each four-inch *size class* in the stand up to 10 points. Ideally, an old-growth stand would have many small and large trees with fewer individuals in between. *Species diversity* refers to the number of different tree species found in the stand. While more diversity contributes to more stability in a forest, species diversity is not weighted as high as other factors because many forests in SLC are dominated by one or a few species. Finally, *regeneration* is taken into account as an indicator of forest health, but only five points are given here because the

Table 1. Old-growth scoring

CRITERIA	Maximum Points	STAND			
		Elder Grove	Peavine Swamp	Beaver Creek	Holzhausen
Age	20	20	20	19	19
Cut stumps	20	12	12	18	16
Roads and trails	15	15	10	15	0
Size/context	15	15	15	6	2
Snags and logs	15	15	15	12	15
Subjective	10	10	10	2	8
Size class	10	8	10	4	8
Species diversity	5	3.5	4	2.5	3.5
Regeneration	5	5	3	4	3
<b>Total</b>	<b>115</b>	<b>103.5</b>	<b>99</b>	<b>82.5</b>	<b>74.5</b>





Map created by Bill Olsen, GIS/GPS Technician at St. Lawrence University

Figure 1. Old-growth stand locations

focus of the program is on identifying old and minimally disturbed forests.

## Results

Four stands have been evaluated so far that meet our minimum requirement of having evenly dispersed trees of at least 160 years old in stands at least five acres in size (Figure 1). The Elder Grove stand lies outside of SLC but is used here as a benchmark to which other stands within SLC can be compared. Elder Grove is touted by Kershner and Leverett (2004) as the best old-growth stand in the Northeast. The Peavine Swamp stand is in Adirondack State Park. The other two stands—Beaver Creek and Holzhausen—lie outside of the Park. All stands are on public land except Holzhausen, which is on private land.

### Elder Grove

Elder Grove is located just east of Paul Smith's College off Highway 86. The forest block surrounding the stand is relatively large and unbroken. There are no obvious and established trails inside the stand. The only signs of human disturbance we noted was the tagging of large white pines, presumably part of a

research project, and one cut stump. We documented species including balsam fir, white pine, white cedar, hemlock, sugar maple, striped maple, paper birch, yellow birch, and American beech in a variety of ages. Some of the white pines and cedars may be as old as 400 years. During our survey we also noted the loamy soil and the presence of a variety of ferns and mosses. There was also evidence of tip mounds, creating an undulating and pitted forest floor. Within our plots there were several logs of varying decay classes and large snags. We also observed many bird species, including pileated woodpeckers. Adjacent to the stand, there is a good candidate stand for potential future old growth, as well as some significant snags. We found no evidence of invasive species. Elder Grove is an impressive old-growth stand indeed. It scored 103.5 of the possible 115 points and serves as a baseline to which we compare other stands.

### Peavine Swamp

The Peavine Swamp trail makes access to this stand easy. The trail is located off Highway 3 east of Star Lake in the southeastern part of SLC. Located in

Adirondack State Park, this stand is currently protected from logging. The trail takes one past a couple of impressive, massive hemlocks over 40 inches dbh that may be over 400 years old. This is also an impressive old-growth stand. While not large, roughly 20 acres, its lack of logging, species diversity, and woody debris structure (logs and snags) make this the highest-quality old-growth stand in SLC we evaluated. Points were taken off its score because of the trail running through the middle of the stand, but it could be argued that the trail makes this stand more valuable for conservation purposes because of its exposure to hikers and skiers who can rally for its protection.

### Beaver Creek

Local Department of Environmental Conservation staff recommended this site. After a few days searching, we found a small, roughly eight-acre oak stand located west of the town of Gouverneur on state-owned land. Part of a larger forest block, the stand has a small river running its length and is surrounded by agricultural fields. The stand mainly comprises large red oaks and some large snags. The understory has a thick concentration of hawthorns on poor, dry soils. There are few medium-sized trees in the stand, which is why it scored so low on the size-class distribution. The surrounding forest block has been heavily logged.

### Holzhausen

Located near Ogdensburg, this deciduous stand is a unique old-growth stand for the area, which largely comprises agricultural fields and heavily logged small forest remnants. The stand is small, roughly nine acres, but is valuable for its uniqueness and history. The property was once home to an orphanage and summer recreation area. The land is privately owned, but preserved for the owners by the Ogdensburg Land Trust with a conservation easement. A small number of cut stumps were found in the stand, concentrated close to an eroding



dirt access road. The eroded road significantly reduced this stand's overall score. Away from the road, the stand shows little evidence of disturbance and no fire scars. The stand consists of diverse mixed species of all size classes. The most impressive feature of the stand was the high number of large, old sugar maples, some over 225 years old. For its size, this is a surprisingly healthy stand with ample regeneration and medium-sized trees.

**Future Work**

In order to achieve our goal of establishing a landscape of old-growth reserves connected by longer-rotation forests, more information will be needed. Evaluations of potential old-growth stands will continue on public lands, but as we continue the search for potential old-growth in SLC, it is important to realize that more than half of the forested land in the county is on private land, a quarter of which is owned by absentee landowners (Montan 2005). Permission

to evaluate additional stands on private land will be sought via the program's website. Establishing a forested landscape of interconnected old-growth reserves will require cooperative efforts on both public and private land. As with the Minnesota program, once a data base of old-growth stands in the county has been established, the next step is the protection of these stands to allow natural ecosystem processes to restore and develop old-growth landscapes. Protection of the largest tracts of old-growth should be targeted first. Fortunately, most of the forests that are potentially old-growth are already under protection in the Adirondack State Park.

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