



Restoring New York Woodlands

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The Situation in Simple Terms

New York has a long history with and dependence on its diverse and productive forests. The conditions that allowed the current forests to develop are no longer present. The health, vigor, and utility of the next forest, the 3rd growth forest, depends on the willingness and ability of owners and managers to restore adequate conditions that allow for the regeneration of private woodlands. The challenges and the consequences are significant. This document responds to several common questions about the current and future condition of NY's private forest lands.

Is there something wrong with NY's woodlands? Why do we need to worry about restoring them?

There are some positive characteristics of NY woodlands, our woodlands are healthy, vigorous and robust. For example, the total acreage of forest land is significant (almost 19 million acres of public and private land) and relatively unchanged in recent decades. Also, the total growth of wood volume is much greater than the volume being harvested. However, to understand woodlands you have to think in a forest time frame of many decades. The current forest, the big trees that most people see, began in the late 1800's or early to mid 1900's. Those trees are maturing and all will eventually die or be harvested. The next generation of forest trees is predicted by seedlings and other plants growing in the understory layer, from knee to head high. The understory layer is often composed of quite different species from the overstory in many woodlands, and in many cases the current understory plants won't provide society with the same benefits that the current overstory trees provide.

When people think about the question posed above, "Is there something wrong?", some draw from their experience of seeing green hillsides and knowing that harvest volume is less than growing volume. People see that management is happening on private woodlands.



Measures of successful management, taken in total across the state, neglect the patterns that are happening on many individual properties. The trees being harvested now began growing 60 to 100 years ago. Looking toward the future, the key question is whether the woodlots being harvested now will be able to produce the same goods and services in the future.

What is the current condition of NY's woodlands?

New York is dominated by woodlands. The state has approximately 30 million acres, and 18 million acres are forested. Almost 50% of the state is owned and managed by private woodland owners. Today's forests occupy the land where extensive forest clearing occurred in the 1700's and 1800's, and the new forests regrew after the decline of agriculture that started in approximately 1880.

The forests that we see today began with at least three conditions that differ from today's forests. First, those forests began with full sunlight associated with abandoned agricultural fields. Today's forests often have small-scale openings that provide less sunlight and favor different types of tree species. Second, the seedlings of current forest trees became established and began growing when deer populations were low, almost non-existent in much of NY. Today, there are more than 1,000,000 deer in NY. Deer preferentially browse the same tree species that we want to grow in our forests. Third, the forests we see today were not exposed to pressures of invasive and interfering plants and destructive insects. The forests we try to grow today are subjected to numerous pests which alter their biology and ecology in ways that do not favor the success of common desired species.

The thought of "restoring" NY's woodlands seems big. What issues are involved?

Deer, Vegetation, High-Grading – The three big factors, discussed here in detail, are deer, interfering vegetation (native and exotic), and poor harvesting practices such as high-grading. While these three are most dire, they interact with the other issues discussed in this question at many levels; each deserves considerable attention by owners, managers, and anyone who wants to sustain NY's forests.



Markets – The markets for forest products may factor into restoration as both a means and an end. The ability of an owner to utilize a market demand for low-value wood provides opportunities to “weed the garden” at little or no cost to the landowner. The presence of a market for higher value timber crops provides an incentive for owners to invest time, taxes, and energy in a long-term commitment to growing high quality trees. Market forces that affect forest products are as complex as other types of resource-based industries. Healthy markets depend in part on the recognition by forest owners, consumers and the public of the value and importance of growing and using NY trees.

Taxes – Taxes factor into the challenge of forest regeneration and restoration because money paid to taxes are funds not available for other land-based investments. Although property taxes alone may not be a single driving force in land management decisions for most owners, tax rates interact with other considerations and can reduce the capacity of owners to accomplish their ownership goals. Revenue and inheritance taxes may further limit if and how owners manage their lands, and the ability of future owners to successfully continue in the long-term process of forest management.

Owner interests and demographics – The interest and ability of owners to ensure successful regeneration on their property depend on many factors. Owners need to be aware of barriers, be willing to take additional steps, sometimes invest or delay income, and keep a long-term outcome as their target. Many personal circumstances and attitudes influence whether an owner is willing and able to rise to this challenge.

Attitudes of the public – The local community and county and state government can either support or impair owner efforts to sustainably manage their woodlands. Sometimes, well-intentioned local ordinances can complicate legitimate and common forest management practices. NY has a “Right to Practice Forestry” law that allows a resident of a town to request that a proposed ordinance be reviewed for its impacts by the NYS DEC Division of Lands and Forests. Further, the local community members can be important players as consumers for local products. Firewood is almost exclusively a local product, except in specific circumstances. Lumber, boards, and value-added products can also be acquired locally in many cases.

Environmental conditions – Both local conditions of short duration and broad geographic conditions of long duration can impact the success that owners and managers have in their



efforts to restore and regenerate their woodlands. Research and education to understand and mitigate these phenomena are important.

What limits the long-term health of the forest?

The health of the forest could be defined in various ways. When viewed in a time scale of decades and spatial scale of square miles, one appropriate view of forest health is the ability of the forest to reproduce itself and continue to provide through time the same benefits that are currently enjoyed. Society depends on forests to provide numerous benefits, called ecosystem services, and the type, quality, and characteristics of trees and forest stands determine many of the benefits the forest can provide.

Today's forests began their growth cycle at a time when there were few deer, virtually no invasive insect or plant pests, and in conditions of full sunlight reaching the seedlings. Many forests in NY are limited in their current reproductive ability by three factors: (i) overabundant deer, (ii) interfering vegetation, and (iii) harvesting practices that remove the trees necessary to re-seed a diverse and productive forest.

Deer are common throughout NY, except in some areas of the Adirondacks and Catskills. Many people experience the impacts of deer in their gardens. Forest understory plants are subjected to the same browsing pressure as garden plants. Deer will eat from 6 to 8 pounds of fresh forage a day. There are approximately six-hundred 3-inch maple, oak, ash, or cherry tree seedlings or branch tips per pound. If every other day one deer fills half its nutritional requirements through tree seedlings or seedling tips, that one deer will eat almost 400,000 seedlings per year. This browsing pressure can shift the forest towards tree species that deer don't eat, and can thus fundamentally alter the species composition of the future forest.

Seedlings require sunlight to survive, and in most forests light is the environmental variable that is most limiting to seedlings. Because of the browsing pressure exerted by deer on forests, the tree species that dominate the understory are those that deer typically don't browse. These species include shade-tolerant American beech, hophornbeam, black birch, American hornbeam, striped maple, ferns, and numerous invasive shrubs such as European buckthorn. These species don't provide the benefits that the current overstory trees



provide, and their shade negatively impacts more desirable seedlings that remain close to the ground, stunted and browsed by deer.

Forest owners may knowingly or unknowingly allow timber harvesting practices that remove only the biggest and best trees. The remaining trees are less vigorous, perhaps of a different or less valuable species, and of poorer quality; the remaining trees, however, are often the same age. The remaining trees are the “runts of the litter,” and are left to provide seed for the next forest. Because the biggest and best trees are few and scattered, only small openings in the forest are made. The small openings provide little sunlight and favor species that tolerate shade. The process of cutting only the biggest and best trees is known as “high-grading,” or may be implemented by cutting all trees larger than a specified diameter. These practices degrade the qualities of the current and future forest.

High-grading has negative financial impacts as well. High-grading concentrates the financial value in the current harvest, despite expectations that future trees will grow into valuable stems. Thus, future harvests will likely produce less value and volume. Owners interested in sustainable practices will invest revenue from a timber harvest into management activities (e.g., deer control, interfering plant management) that support the regeneration of the next forest.

There are other factors that limit the success and health of a forest. These include, for example, insects, pathogens, and weather events. Factors can act individually or in combination. Owners and managers should be alert to these potential problems, understand how trees respond to specific stressors, and develop plans to guard against those impacts.

Are there negative consequences of failed or inadequate regeneration?

Because the regeneration layer is, for all practical purposes, the next forest, failed regeneration will prevent the next forest from providing the values and benefits currently enjoyed. As pressures mount on a forest, the costs and energy expenditures to restore that forest climb. Unfortunately, because the hillsides remain green many people are deceived into thinking that all is well.



There is an awareness of the regeneration problem among people who spend time thinking about the condition of the forest, including woodland owners, educators, and research specialists that they describe as “the big green lie.” The basic premise of this concept is that people who are not attuned to the details of NY’s wooded landscape, see trees with leaves (the green part) and assume that there is no problem (the lie part). As mentioned above, there are several serious concerns. Those concerns are connected to at least three different consequences of failing to act to achieve diverse and productive forests.

Ecosystem services – All woodlands provide some level of ecosystem services, or the fresh air, clean water, wildlife habitat, carbon sequestration, etc. that owners and society want and need. As a wooded acre become degraded through loss of tree and herbaceous diversity, through increased abundance of deer and interfering plants, or through exploitive harvesting practices, the number and quality of ecosystem services declines. For example, in areas of high deer populations, there have been measured declines in wildflowers and song birds. As diversity and productivity decline, so do many of the ecosystem services.

Rural economic development – Rural communities are valued in NY because of their character and their important role in providing raw materials (e.g., food, fiber, fuel) to the rest of the state, nation and world. The NY forest products industry is a vital component of rural areas of the state and is supplied by those rural areas. Because of the long term growth cycle of forests, most of the forests being harvested today originated prior to the onset of the current barriers that limit forest regeneration. Forest owners, the forest products industry, and society should all be attentive to the needs of forest regeneration because all have a stake in its success.

Land value – Currently, the prices that buyers are willing to pay for rural land seem to be independent of the value of timber on that land. This attitude reflects the “green lie” concept, ownership objectives that are independent of the future value of the trees, and that owners are not aware of the true economic value of the land. As the availability of good quality timber declines, as it might, the forest products industry will be harder pressed to find raw materials, and the value of timbered acreage may increase. Unfortunately, by the time this connection between supply and demand is made, there may be an accumulation of degraded wooded acres that



missed the optimal chance to regenerate, delaying and complicating their ability to return to a productive capacity.

What should landowners do to restore the forest?

Private forest landowners have many pressures. At the time most owners purchased or inherited their land, most were not aware of the multiplicity of challenges they must confront to sustain (or improve) their forest. Forest owners must be educated, active advocates for healthy forests and good forestry.

Learn general and specific ecological principles: Owners have access to numerous resources about the ecology and management of forests in general. These general principles will help the owner assess the conditions in their particular forest. The interaction of many species of plants and animals, on a variety of soil types with assorted management histories result in parcel-specific conditions. The owner may be well-served to [invite a DEC forester](#) to walk their property and learn about the specific conditions that exist. Owners can also contact a Cornell Cooperative Extension [Master Forest Owner volunteer](#) for a free visit to talk about educational and other resources that might be available. The owner that knows the specific conditions of their land and the availability of resources/assistance will be able to make more informed decisions with better control over the outcomes.

Develop a plan to offset the primary barriers to a healthy forest: The ecological and management principles that apply to a property need to be considered within the context of the [owner's objectives](#). The owner's objectives describe the desired outcome and set a framework for the owner to use their resources of time, interest, money and energy to guide their forest. A public service forester from the DEC, or a private sector forester can work with a landowner to develop a management plan that considers the conditions of the land, the owner's objectives, and the owner's capacity. The owner who follows their plan, making adjustments as appropriate, will have a fuller and more enjoyable ownership experience.

Help educate other owners about the consequences of a degraded forest and solutions: Owners who go through the process of learning the general and specific ecological and management principles for their property are an important resource for other owners.



Informed owners can learn even more about their forests through participation in the [Master Forest Owner](#) program and involvement with the [NY Forest Owners Association](#). Forest owners can play a prominent role in resolving the issues that confront private forest lands. Current owners, future owners, the forest industry, and the “general public” all have a vested interest in ensuring woodland owners are informed and engaged.

What should the “general public” do about a degraded forest land base?

Most people who do not own forest land have little interest in knowing about the unique challenges that face woodland owners. This isn’t surprising. Hopefully, people in cities, suburbs and rural communities understand that the resources they use (e.g., water, food, renewable energy, lumber, paper, etc.) are produced through processes involving individuals and institutions making decisions with both short and long term consequences. Users of forest resources will hopefully consider current and future needs. The management and acquisition of forest resources requires that owners have a variety of tools available. Some tools and techniques, such as herbicides and harvesting practices, have been inadequately or inaccurately portrayed because of misunderstanding and misinformation.

The users of natural resources should strive to attain an accurate understanding of how resources are managed. They should consider the current management practices within the long-term time frame of forest development, and use credible sources of information to guide their understanding of the impacts of different management tools and techniques.

Deer hunting is a valued tradition among many people, including those who do not own forest land. Hunters will better serve the needs of future diverse and productive forests by aggressively hunting deer, and concentrating their harvest on female deer as a way to control the population.

What are organizations, institutions, and government agencies doing about this problem?

The concern for restoring a healthy and productive forest is evident across a broad array of academic, private, NGO, and governmental agencies. A full discussion of efforts would be



overwhelming and quickly outdated. A general summary is provided here, but anyone interested should view internet resources of the various entities. A list of those entities is available [here](#).

Private – One of the most prominent private organizations addressing this topic is the [NY Forest Owners Association](#). NYFOA will be 50 years old in 2013, and is a strong advocate for ensuring the successful regeneration of the 3rd generation forests for future societies to enjoy and benefit from. To launch this commitment a number of factors are in play. NYFOA's "Restore New York Woodlands" initiative includes efforts to bring people into the woods to understand the value and challenges of private woodlands and the strategies needed to ensure the continued value of those lands. Included within the sphere of "private" is the forest products industry. These businesses, including loggers, foresters, and processing facilities, have a strong vested interest in ensuring that NY's forests are healthy, productive and sustained.

Academic – academic institutions vary in their focus, but collectively offer education of future professionals, continuing education of professionals, education through Extension for people not currently attending college, and research on topics related to forest restoration and health. In NY, there is considerable investment of people and resources addressing these challenges.

NGO – Non-governmental organizations can play an important role in promoting healthy and sustained private forests. These organizations often have connections with people who are interested in the woodlands of NY, but who may not own forest land. NGOs such as [NY Audubon](#) and the NY chapter of [The Nature Conservancy](#) have demonstrated an interest in sustainable practices. They have also been involved in education and research initiatives that address the proper management of private woodlands.

Governmental – The primary technical service provider for private woodland owners in NY is the Department of Environmental Conservation. The NYS DEC recently developed a [five-year plan](#) addressing the resources, issues and strategies that will ensure our forestlands remain forested, and are managed sustainably. At least 6 of the 10 issues identified in this plan have a direct relationship to the restoration and health of private forest lands.



Webinar and Other Online Resources

High-Grading and Restoration

- P. Smallidge 12/19/2007 <http://breeze.cce.cornell.edu/p47165140/>
- R. Nyland's Webinar 4/15/2009 <http://breeze.cce.cornell.edu/p34463331/>
- J. Finley's Webinar 3/13/2012 <https://meeting.psu.edu/p70119z7233/>

Interfering Vegetation Management

- Interfering vegetation 11/16/2011 <http://breeze.cce.cornell.edu/p8hixd9zwxe/>
- Dave Jackson's forest herbicide webinar 2/15/2012
<http://breeze.cce.cornell.edu/p8rh8e83p8k/>
- Dr. Jeff Ward's IVM Barberry 3/16/2011 <http://breeze.cce.cornell.edu/p21062777/>
- Beech management webinar January 2010 <http://breeze.cce.cornell.edu/p35316678/>
- Assorted related topics <http://cornellforestconnect.ning.com/forum/categories/project-profiles/listForCategory>

Deer Management

- Dr. Jay Boulanger 7/2011 <http://breeze.cce.cornell.edu/p44202688/>
- Drs. Stout and Royo 10/21/2009 <http://breeze.cce.cornell.edu/p68724354/>
- Regenerating Hardwood Forests: Managing Competing Plants, Deer and Light. Penn State University, State College, PA. 7pp.
<http://pubs.cas.psu.edu/freepubs/pdfs/uh181.pdf>
- Jacobson, Michael. 2006. Forest Finance 2: Fencing for Forest Regeneration: Does It Pay? Penn State University, State College, PA. 5pp
<http://pubs.cas.psu.edu/freepubs/pdfs/uh145.pdf>



- <http://www.deerandforests.org/resources/Relative%20deer%20density%20and%20sustainability.pdf>
- <http://deerinbalance.org/>
- <http://nrs.fs.fed.us/news/review/review-vol16.pdf>

Miscellaneous Resources on NY Forests

- NY Forest Resource Assessment Strategy 2011
http://www.dec.ny.gov/docs/lands_forests_pdf/fras070110.pdf
- NY Forest Resources 2007 www.nrs.fs.fed.us/pubs/rn/rn_nrs66.pdf
- NEFA NY Forest Economic Impacts
<http://nefainfo.org/publications/2007%20Publications/NEFAEconomicImportNY.pdf>
- NA S&PF 2012 NY forestry facts http://www.na.fs.fed.us/ra/factsheets/ny_brief.pdf
- Shirer, R and C Zimmerman. 2010. Forest regeneration in New York State. The Nature Conservancy. 25 pp.
http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/newyork/placesweprotect/easternnewyork/final_nys_regen_091410_2.pdf
- Connelly, NA, PJ Smallidge, GR Goff and PD Curtis. 2010. Foresters perception of forest regeneration and possible barriers to regeneration in New York State. Cornell University Department of Natural Resources Human Dimensions Research Unit HDRU 10-2. 37 pp.
<http://www2.dnr.cornell.edu/hdru/pubs/HDRUReport10-2.pdf>
- PSU Webinar Series Archives <http://extension.psu.edu/private-forests/tools-resources/webinars/previous>
- Prescribing regeneration treatments for mixed oak forests
www.treesearch.fs.fed.us/pubs/18561



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