

## **The Troubles with Virginia's Hardwoods**

**By: David Carter, Virginia Tech**

I've been asked to share the grim and ghastly challenges Virginia's hardwood forests face. Our hardwood forests, or more broadly, our natural forests, have a lot of issues: a decline in timber quality; widespread conversion toward mesic species; nonnative invasive plants, pests, and diseases; and the looming threat of climate change. Addressing these issues is doable. But, addressing these issues will require you, the landowner, to invest money into your forest and not likely see a return on that investment in your lifetime. That's rough. What's more, even if you are willing and able to do the work, you may not be able to find a contractor. Let's try to address these issues one at a time and talk about what you, as a landowner, can do about them. Among all this bad news, there is good news, I promise.

High-grading is a four-letter word for foresters. The directive for such exploitative harvesting is "cut the best and leave the rest." It's sometimes described as "mining for timber." Loggers like it because it's the most efficient use of their time; landowners permit it because post-harvest they still have something resembling a forest and money in their pocket. If you own a naturally regenerated forest in Virginia, it's likely that it's between 65 and 120 years old, was once completely cutover, and has been high-graded multiple times since. The negative impacts of high-grading may not be apparent to the untrained eye and landowners may opt to have it done again. The result is acres of woodlots that don't possess enough quality timber to financially support quality management. In other words, there are so few trees of any value left, the only economically feasible harvesting a logger is able to do is high-grade. Unfortunately, forests often can't regain the value lost from this type of harvesting on their own. Furthermore, without the self-funding mechanism of sorts in the form of harvest profit, the expensive management option of slowly putting value back into a high-graded stand via deliberate management is likely to never become popular. High-grading is an insidious and widespread problem that degrades a forest resource over lifetimes, with each new generation of landowners buying or inheriting land they never knew to possess a greater quality. The quality of today's forest is often just accepted as "what it is."

I saw this quote one time after another silviculturist's email signature and always liked it. I believe the quote is attributed to Dr. David Loftis: "If you walk into a 10-year old hardwood stand and think you'd like to do something to try and change the species composition, you're probably 20-years too late." In other words, managing a hardwood forest generally requires periodic treatments throughout the forest's life in order to maintain some control over how the forest grows and the species it possesses. Most folks don't manage a forest

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much, if at all, prior to harvesting, however. It's costly, complicated, and not always successful (what a sales pitch!). However, current species composition and timber quality trends are concerning. Without a concerted effort, there will likely be a continuation of the declining numbers of ecologically and economically valuable tree species in Virginia.



***A high-grade harvest leaves less-desirable trees behind, including ones with crooked, diseased, and damaged stems, as well as less-preferred species. The remaining canopy cover is still relatively closed, preventing the adequate light needed to promote regeneration of desirable oak species. Photo by: Rich Steensma.***

Many of the species we seek to have in our forests (e.g. oaks, hickories, walnut) need to be abundant in the understory as seedlings and saplings prior to harvest, or else they're unlikely to show up in great numbers or at all post-harvest. Harvesting a hardwood stand is commonly the only management decision a landowner makes. This is partially the reason why we see an increase in species like blackgum, red maple, and yellow-poplar throughout Virginia. These species thrive under the default management regime of "wait, harvest, then cross-your-fingers something valuable grows back."

Having a plan and doing something (anything) in preparation for your eventual harvest could go a long way for your property. David M. Smith said in his silviculture textbook, "The ultimate act of regenerating a stand is so crucial that it should be kept in view throughout

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the whole rotation.” If the groundswell of proactive family forest owners was big enough, just some preparation for harvest could have a pronounced impact on the entirety of Virginia’s forest products industry. Conveniently, the job of a forester is to help you, the landowner, make this type of plan. Seek them out and you’ll agree, they’re some of the finest, most intelligent and best-looking people you’re likely to meet.



***Advance regeneration, such as this oak seedling, need to be well-established prior to a timber harvest to ensure adequate regeneration will be present after the harvest. Although harvesting may damage these smaller trees, they will quickly respond by resprouting. Photo by: Craig Lorimer, University of Wisconsin, Madison.***

Next: “Mesophication.” You may have heard this word. It’s 50-cent word we academicians throw around to make ourselves sound learned. We use it a lot. All it means is plants that like wetter growing environments (i.e. mesic species) are, for a myriad of reasons, showing up where drier species used to dominate. So, in all likelihood, those seedlings and saplings you have hanging out beneath the canopy in your forest are probably mostly these mesic species. You’re being meso-phied as you read this and you didn’t even know it. Don’t be alarmed, you’re not alone. It’s essentially what’s happening across the country. It’s concerning because the dry-loving species are the species that have been dominating these forests for the longest amount of time, meaning thousands of years. The species in the overstory are dry-loving but their eventual replacements in the understory are all wet-loving. So, what happens when we harvest? Well, we see these wet-loving species become more common components of mature forests. This could mean our forests become less tolerant of drought, stop providing certain habitat and food sources for wildlife, possess less valuable timber species, and the forests, on the whole, just behave differently than they ever have – and we don’t really know what that could ultimately mean.

The nonnative invasive insect, the emerald ash borer, is expected to cause the functional extinction of all ash species in the U.S. Hemlock woolly adelgid has been slowly killing off our hemlock species. Dutch elm disease is causing widespread mortality of our elms. Chestnut blight effectively wiped out our American chestnuts. Walnuts suffer from thousand cankers disease. Oaks suffer from defoliating, non-native moths, sudden oak death, and oak decline, among other things. Moreover, if a native seed falls from a surviving mature tree, that seedling commonly has to compete with an intimidating litany of non-

native plants that are generally fierce competitors for resources. That tranquil vista out your back window is a silent battlefield, where there are, by far, more outcomes of death than of life (I told you it was going to get grim). While there isn't much we can do to prevent insects and pathogens from damaging our existing forests – save for buying and planting resistant breeds of some species – we can attempt to control nonnative invasive plants. But, again, this is expensive and generally something that has to be kept up on a regular basis.



***Nonnative invasive species are affecting the composition and function of our native forests. This photo shows dead ash trees (back right), killed by the emerald ash borer, and nonnative invasive tree of Heaven (front left) coming in underneath. Photo by: Jennifer Gagnon, Virginia Tech.***

Lastly, it is anticipated that droughts, storm events, and the outbreaks of the aforementioned pests and pathogens are going to get worse or more variable as climate change wears on. Climate change and all of its associated effects on how forests function and interact with the abiotic and biotic environment is pushing us toward an uncertain

future. We don't know how worsening droughts and more mild winters may influence the population of a nonnative defoliator. We don't know if tomorrow a new nonnative invasive pest will emerge. Luckily, we have a system in place to look into this kind of stuff. There is an army of Poindexters, like myself, who have committed themselves to trying to figure out remedies to big problems like this. And there is research that's been done and is continuing to be done to help guide decision-making in the woods to address this very issue.

Now, the best news: The Virginia Department of Forestry is launching a new effort to help landowners tackle these issues. You will be able to find the support you need to help you make informed and effective decisions. In the subsequent articles on this topic, we will lay out exactly how. Stay tuned!

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