The New York Forest Owner

A Publication of The New York Forest Owners Association

Promoting woodland stewardship since 1963

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New York's White Oak: Noble Past, Imperiled Future

Volume 62 Number 4

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Volume 62, Number 4

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Cover: A majestic, 54" diameter roadside white oak in Danby, NY. The massive, spreading crown and stout, near horizontal branching typify the growth habit of this venerable species when grown free of competition. Photo by Jeff Joseph.

From The Executive Director

Why did you join NYFOA? Think on this question for a moment and I'll circle back to why I'm asking.

As many of you know, I have been a professional forester for nearly 35 years. I have interacted with and served the private forest owner the entire time. Up until about the halfway point of my career, the private forest owner could be described on average as someone who had a rural upbringing on a farm or in a timber town, or were from a hunting family, or had some other past connection to the woods; it was only natural that they would own land themselves someday. On average, these people were in their upper-50's to their late-60's in age; the age where most were finally able to buy land, or they had inherited it. Their interests in the land were more basic, oriented around farming, timber management, hunting, and perhaps with a little recreation and relaxation sprinkled in. Maybe you identify as one of these "traditional" landowners.

Over the last 20 years, however, I have noticed that the demographic of private forest owners has broadened. I have seen a growing trend of more people with the means to buy land as early as in their 40's. For today's hunter, hunting is a much more intensive year-round pastime of study, management, and scouting; their passion started early and is so great that some as young as in their 30's are finding a way to own a hunting property, even if that means pooling their money with others to buy it. The trend of homesteading, simple living, and self-sufficiency or off-grid living as a lifestyle has grown and motivated younger do-it-yourself people to prioritize land ownership for their primary residence over a conventional home. There is also an increasing number of people from urban or suburban areas buying land who don't necessarily have a rural upbringing but have profound love of the outdoors; they have varied interests but for many the primary goal is escape from that urban environment where they can enjoy outdoor recreation and solitude, but they also want to be a good steward of their land. Maybe you identify as one these "new" landowners.

I have had the opportunity to represent NYFOA at various events manning a booth where I have met a lot of great people, told them about who NYFOA is, and recruited some new members in the process. Some were the "traditional" landowner, but many more were the "new" landowner. Regardless of which category they fell in, with few exceptions, they all had one worrisome thing in common—they had no idea that NYFOA existed. I'm sure some of you reading this were one of those people at one time. There was one other important thing that they all had in common—they were excited by what NYFOA had to offer and wanted to join. The educational and networking opportunities that NYFOA offers in fulfillment of its mission are of great interest to landowners, especially those new landowners who want to be a good steward, but not are not sure where to start; NYFOA (you) can show them.

The point of this is that despite the fact that NYFOA has existed for over 60 years, it lacks broad exposure and recognition, which makes attracting new members difficult. We are exploring ways to change

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The mission of the New York Forest Owners Association (NYFOA) is to promote sustainable forestry practices and improved stewardship on privately owned woodlands in New York State. NYFOA is a not-for-profit group of people who care about NYS's trees and forests and are interested in the thoughtful management of private forests for the benefit of current and future generations.

Join!

NYFOA is a not-for-profit group promoting stewardship of private forests for the benefit of current and future generations. Through local chapters and statewide activities, NYFOA helps woodland owners to become responsible stewards and helps the interested public to appreciate the importance of New York's forests.

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New York's White Oak: Noble Past, Imperiled Future

By Jeff Joseph

I. White oak ecology and current status in New York
II. White Oak initiative interview
III. The wood in your woods: *Quercus alba*

As stewards of woodlots across our state, the actions we engage in today are vitally important and impactful, but to a large degree, good forestry is ideally about the future at least as much as the present, with today's management decisions setting the course and determining the composition of our timber stands for the decades and even centuries to come. With only a very small fraction of New York's nearly 14 million acres of privately owned woodlands being guided by *any* type of management plan, let alone one that projects forward a full rotation or longer, the current trajectory of our forested acreage taken as a whole is wildly unsustainable—at least if we care about maintaining the diversity and resilience of these forestlands.

As we have tried to highlight for years in these pages, this lack of long-range planning, and, in many circles, the outright denial of the data illustrating the root causes and extent of the regeneration failure of many of our most prized species of trees, will leave our woodlands greatly diminished in their ability to provide sawtimber, wildlife habitat, and, most alarmingly, seed for the next

Figure 1. White oak seedling. It will need sunlight—and protection from deer—in order to survive and grow to maturity.

Fgure 2. White oak poles can survive for a time in a shaded understory, but will eventually decline and die without the removal of the overtopping competition. Thankfully, as seen here, young white oaks do have the ability to sprout and try again.

generations of forest. Unfortunately, white oak is one of the species at the edge of this precipice, with a dire lack of viable regeneration statewide (and beyond), and thus provides a valuable case study for assessing the extent of this problem, and ideally, for considering and committing to some planning *and* actions that will help ensure its future.

White Oak ecology and current status in New York

White Oak (*Quercus alba)* is the most highly valued member of its genus in New York State, long prized for its great strength and versatility as a sawtimber, and also as an important niche for countless species of wildlife. It is present throughout the state, excepting the higher elevations of the Adirondacks and Catskills. Its most frequent associates are other oaks and hickories, but it is a component of a number of other forest types in its range. White oak normally grows in mixed, uneven-aged stands, though occasionally in near pure stands after major disturbance such as clearcutting. It thrives in deep, moist, well-drained soils, but is capable of competing favorably on all but the driest and wettest soils. Low soil mineral and nutrient levels seem to be less of a limiting factor to good growth than poor drainage or excessively droughty soils, allowing it a competitive advantage on less fertile soils.

Like all oaks, (*Q. alba)* is a monoecious species, and is wind pollinated, so is capable of fertilizing its own flowers and reproducing in the absence of others of its kind or pollinating insects. It matures its fruits—short-stalked, oblong ¾" acorns with caps that enclose about 1/4th of the nut—in a single season. These fruits are disseminated by squirrels, birds, and wind, but mainly by gravity, so most often do not end up far from the parent tree, limiting the pace of the spread of this species across the landscape.

Once a white oak acorn matures and falls to the ground in autumn, a unique competitive strategy is then employed, as they germinate almost immediately, and continue to grow until freezing temperatures set in, rather than laying dormant until the following spring, giving them a head start in the battle for light, water, and nutrients. It also is a means of avoiding being eaten by all the creatures that favor white oak acorns as a nutrient dense food source.

Most energy is initially devoted to the development of a long taproot, which can be over 12" long before the top growth is much more than 3-4" tall, with access to water a clear priority over shoot elongation at this point. A layer of loose leaf litter is critical during this initial period (when leaves are naturally falling anyway) to ensure that moisture levels remain adequate to keep the germinating seed from drying out before the roots can take hold; this leaf bed can also help to hide the acorns from predators. Forest grown white oaks begin to produce seed at around 50 years of age, and will continue to produce good crops for a century or more. Good mast crops are intermittent though, only occurring about once every 4-10 years.

White oak can also reproduce by sprouting from the stump after harvest or fire kills the stem, though this ability diminishes after about 80 years of age.

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Sprouts that originate low to the ground have a much better chance of survival without later succumbing to heart rot. It is thought that much of our current second growth white oak actually began as vegetative sprouts rather than from seed.

Once white oak acorns have turned into viable seedlings, they develop a significant degree of shade tolerance, allowing them to persist and continue to grow even in the shadow of a dominant overstory. Overtopped white oak poles often still have full and vigorous crowns, though this capacity to tolerate low light conditions diminishes with age, so if no larger-scale harvest or thinning is planned, releasing individual crowns of promising trees from competition using a crop tree management approach is a user-friendly strategy to encourage their growth and to promote greater mast production.

White oaks are generally quick to respond to crown release, and if healthy and already growing at a good rate do not tend to develop any significant epicormic sprouting along their stems, which are normally straight and clear of low branching when growing in a competitive forest setting. If epicormics do develop after release, studies show that they can be pruned up to about 1.5" in diameter without risk of infection to the main stem. Patch openings can also be created as part of a small-scale, localized regeneration strategy, with the general recommendation of a minimum size clearing around seed trees equal in its dimensions to at least the height of the tallest of the surrounding trees, which ideally allows for 35-55% of the available sunlight to reach the forest floor.

On good sites, white oak can be expected to grow up to 100' tall and 4' in diameter, if not larger. It is also a very long-lived tree, often surviving for upwards of 400-600 years.

In terms of population numbers in New York State, oak/hickory forest types cover 17% of the state's forest area, with the highest concentrations in the lower half of the state. There is limited data about white oak alone, but I was able to gather the following:

- It is not in the top 18 tree species in New York in terms of the total number of either seedlings or saplings
- White oak seedlings amount to less than 1% of all forest tree seedlings in New York
- In terms of net volume (in billions of cubic feet of standing wood), white oak ranks 13th among New York's forest tree species, and net growth currently exceeds both timber harvest and mortality by a fair margin.

Figure 3. Mature white oaks such as this one would be a welcome sight in anyone's woodlot, but without our intervention to provide the necessary conditions for regeneration, future woodlot owners will not be so fortunate.

The upshot of all this is that there are lots of BIG, mature white oaks around the state that have a lot of valuable wood in them, and that are still managing steady (if slow) growth, but there is a gaping hole in the numbers of the younger age/size classes. Nearly 1/5th of New York's forestland is oak/hickory, but of that total only **three percent** is classified as young forest (0-20 years of age). Basically, there is a massive failure of white (and other) oak regeneration that has been progressing for decades. It has been estimated that over 99% of oak seedlings die before reaching 5 years of age. So even if our current population of big mast producing oaks continues to pump out acorns, without other measures to assist and ensure seedling survival it will make no difference, and the big trees will eventually die without any heirs, so to speak, leaving our woodlands greatly diminished.

I can see this process reflected in my own woodlot, which is primarily beech-maple, but where I count at least a half-dozen high quality, mature, sawtimber-sized white oaks (including a mammoth 34" DBH hedgerow specimen that likely was the seed source for all the others), a few scattered (and mostly suppressed) poles, and an ongoing, spotty distribution of seedlings that come—and invariably go—as fast as the deer can find them.

What a white oak seedling needs to become a mighty oak is pretty simple: adequate soil moisture, some loose leaf litter on the soil surface for a seed bed, at least partial sunlight reaching the forest floor (facilitated by disturbance, whether natural or man-made), and, perhaps above all, to have the time to extend a terminal bud above the browse line of white-tailed deer, which may be our biggest challenge at this point here in New York. But in truth, the challenges are many, have been a long time in the making, and reversing this immanent disappearance of white oak from our woodlands will require a substantial commitment by government agencies, the timber industry, and last but certainly not least—by woodland owners like you and me.

The White Oak Initiative: *An Interview with Executive Director Jason Meyer*

Interview conducted and edited by Jeff Joseph

To place this issue's focus on white oak in a broader context, I reached out to Jason Meyer, the executive director of the White Oak Initiative, who generously took the time to answer my questions in detail. The following is a lightly edited version of our conversation.

Hi Jason. To start, thank you for your willingness to share some information about the White Oak Initiative (WOI) and its efforts with our readers. Can you give us a brief summary of the origin of the organization, and briefly describe its primary mission and activities?

You're welcome – thanks for asking me!

The White Oak Initiative (WOI) was formed in 2017 by a group of organizations that all rely on or care about upland oaks, and white oak in particular, for a variety of reasons. The three founding partners – the University of Kentucky, Dendrifund, and the American Forest Foundation – recognized that while there were substantial numbers of mature white oak across its range, the Forest Inventory Analysis (FIA) data from the Forest Service showed that there were relatively few seedlings and saplings in their surveys. What this means is that twenty years from now, the number of mature white oaks across the landscape will decline significantly as they are not being replaced by younger white oaks.

The WOI was formed to bring awareness to this issue, and to bring stakeholders from a variety of perspectives together to address the challenge more efficiently. Our mission is to be an advocate and catalyst for sustainable upland oak forest management, with a focus on white oak regeneration. We accomplish this through convening, connecting, and collaborating with stakeholders

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White oak acorns—humble beginnings for such a majestic tree. Photo courtesy of the White Oak Initiative.

to increase economic, social, and ecological benefits of upland oak forests. As you can see, this requires several perspectives, including universities, conservation nonprofits, governmental entities, trade associations, businesses, and of course, landowners.

Can you say a little about your background as a forester, and about your current role as executive director of the WOI?

Sure! Growing up, even though I was raised in a city, I loved the outdoors. Whether it was Boy Scouts, hunting and fishing with family, or just spending time exploring the woods behind my grandparents' house, I was always looking for something to do outside. I had no idea that you could actually make a living doing that until I was applying for college and saw "wildlife management" on the list of majors!

I attended Purdue University in Indiana and while I majored in wildlife management, I may as well have majored in forestry, too, as the curricula overlapped significantly. During the summer between my junior and senior years, I worked as a seasonal employee on the Boise National Forest marking timber, and it was there that I learned that, by and large, people that I interacted with did not understand the importance of forest management. I graduated with a Bachelor of Science in Forestry and stayed at Purdue to work on a Master of Science with a focus on environmental education. I really wanted the next generation to understand the social, economic, and ecological complexities surrounding the management of our natural resources.

Since then, my career has bounced back and forth between working as a forester and working in the nonprofit sector, but in all cases, helping people understand resource management, including the importance of actively managing forests, has been the keystone. In California, I worked for the San Bernardino National Forest Association as the Program Manager at a place called "Children's Forest," which was over 3,000 acres of federal land set aside for youth to actively participate in forest management alongside resource professionals. I worked for several years as a forester with CAL FIRE, interacting daily with landowners who needed help managing their properties not just for fire safety, but also for forest health.

After that, I returned to the Midwest and was the top executive for two different nonprofit nature centers, again bringing my experience to bear on programming, but these were also the jobs where I really learned about things like strategic planning, fundraising, working with a board of directors, and so on. I think that is what excites me the most about my role with the WOI – it allows me to use my knowledge of forestry, my experience with nonprofit management, and my passion for helping people learn about forest management all in one job!

That's probably more than you wanted to know….

Regeneration failure is a widespread issue, with dire current and future impacts for a great many of our native timber species in the Eastern U.S. Why the focus specifically on white oak?

White oak is a dominant keystone species across the hardwood regions of the central and eastern United States. Spanning more than 20 states, this is an important species ecologically. It is critical to many wildlife and pollinator species and serves as a foundation for many upland hardwood forests. The loss of white oak in these forests would be catastrophic.

At the same time, this is a tree that is also critical to many local economies throughout its range. White oak is used for a large number of commodities, including railroad ties, flooring, cabinetry, and barrels for wines and spirits. I can't go a day without white oak being part of my life in some way or form. The "oak bottleneck" that is forming as a result of regeneration issues will have a tremendous impact on several industries.

So, while the National Wild Turkey Federation and the spirits industries all rely on white oak in different ways, they all rely on white oak. Hence the intentional development of the WOI as a coalition of varied stakeholders all driving toward the same goal – catalyzing and supporting actions that will ensure better regeneration of upland oaks in the future.

The regeneration crisis in our eastern forests is complex, and is the result of a confluence of ecological and cultural factors, many of which have been decades, if not centuries in the making. From the reading I have done in preparation for this interview, it seems that in most areas of its range, there is currently an adequate population of mature, mast-producing white oak to ensure a stable population (and sustainable lumber supply) heading into the future, yet even with adequate acorn production, the seedling and especially sapling classes have been precipitously declining, a phenomenon that, as you mentioned, has been called the "oak bottleneck." I wonder if you could comment on this decline in general, and specifically on the role of certain key factors that I will mention as they pertain to the widespread failure of white oak regeneration:

You've hit the nail on the head – ecological and cultural factors are converging in ways that result in two critical things for the regeneration of species like white oak that require at least partial sunlight to thrive. These are a lack of disturbance, which creates openings for light to reach the forest floor, and competition, which comes in many forms for white oak seedlings. A landowner needs to control both to ensure that white oak seedlings not only emerge but that they get the head start they need to outperform their competitors.

So, where is the lack of disturbance coming from? When you look back 80 years, when today's maturing white oaks were just seedlings, our approach to land management was much more intense than it is today. Simply put, we were actively disturbing our forests more. Today, landowners either don't have the knowledge, the resources, or the desire to actively manage their land. Our society is different, and the most recent generation of landowners is approaching things differently, whether it is how the land is used and managed, or whether it is sold to developers.

In the absence of disturbance, assuming forests stay forests, these will convert to more shade-tolerant species over time. Sugar maples and poplars will outcompete white oak seedlings in shaded environments, so regardless of how many seedlings may be present, in the coming decades, they will lose out to those other species.

But let's talk specifics:

- ***Fire suppression:***

This is akin to the lack of active forest management. While indigenous peoples used fire to modify the landscape around them for hunting, food production, travel, and defense, we now, by and large, suppress fires. This prevents the disturbance necessary to give white oak seedlings the light and space they need to thrive. In addition to this, white oak is somewhat resistant to fire at a young age, while competitors are not. By suppressing fire (or not implementing prescribed fire appropriately), we have allowed white oaks to be exposed to more competition.

- ***Parcelization and fragmentation of woodlands:***

In my mind, this is a threat not just to upland oak forests, but to forests in general. Generally speaking, parcelization occurs for financial reasons – either a landowner wants (or needs) to make some money or those who have inherited the land have no interest in maintaining it and continuing to pay taxes on it. In many areas, it is more lucrative to buy and sell land for development than it is to buy and sell land to manage it for timber. Unfortunately, this all leads to a loss of working forests – often permanently.

- ***High-grading:***

High-grading. Selective cutting. Single-tree selection. While not necessarily the same thing, these terms are used interchangeably. If a landowner is looking to make money today, they can go into their stands and remove the highest-quality trees and do *just* that. But any forester who cares about the resource over the long-term is not going to advise their clients to do this. High-grading results in negative changes to the forest, including leaving only low-value, low-quality undesirable species, resulting in a future forest with little potential for natural regeneration of desirable species. High-grading white oak will have these negative outcomes.

By the way, I'll mention this now – if a landowner really wants to manage their land well, it is critical to engage a professional forester in the planning of management and harvest activities. They will be able to work with landowners to achieve the goals for their property. This is much different than someone knocking on the door and telling a landowner who may not know any better that they are willing to buy all the best trees in the forest for a lot of money!

- ***Invasive plants, insects, and disease:***

These all impact white oak regeneration in negative ways. Whether through competition for resources (light, water, nutrients), damage through defoliation, or death through disease, these all spell trouble for our white oak regeneration dilemma. Controlling these are neither easy nor inexpensive, but they must be addressed.

- ***Climate change:***

Climate change will impact upland oak forests in a number of ways. White oaks are sensitive to soil moisture, for example, and climate change will cause changes in precipitation patterns. Warmer temperatures will cause species (including pests and invasive species) that currently have a more southern distribution will shift northwards. This will cause a change in competition levels and other ecological relationships in upland oak ecosystems.

- ***Lack of intentional woodland management/silviculture:***

This is where it's at when it comes to addressing the future shortage of mature white oaks. At the end of the day, active and intentional management is going to be the solution to this issue. We must continue to disturb our forests, paying particular attention not only to the initial disturbance, but also any intermediate steps that must be taken to ensure that white oaks get the jump start they need to outcompete other species. For example, whether it is through logging or a windstorm, openings created by the loss of overstory trees will see a flush of growth. White oak seedlings spend several years building their root systems before growing "up" and in this time period, other competitors could shade out these seedlings. It will take management of those competitors to ensure that white oaks survive and thrive.

- ***Deer overpopulation:***

Deer can certainly have a negative impact on species regeneration, including white oak. And across parts of the white oak range, white-tailed deer are overabundant. As a deer hunter myself, I rely on the ecological relationship between the white oak and the white-tailed deer – there is no better place for a stand than by a mast-producing white oak! Yet,

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I recognize that 80 years from now, those trees may be more difficult to find, adding "deer overpopulation" to the list of competing factors for successful white oak regeneration. This is yet another thing that will need to be managed as part of this complex issue.

As it is such a primary issue for us here in New York State and the Northeast, I wanted to make an additional comment about deer, and to ask your perspective on the following. In reading through the information found on the very informative WOI website, I found that while deer overpopulation was mentioned a number of times in the "Assessment and Conservation Plan," it was not mentioned at all in any of the "Landowners for Oaks" documents. Not even in the "Landowners Guide to Challenges of Upland Oak Regeneration," which I found quite surprising, and more so as that document even suggests that growing oak seedlings to a height of 3-4' will give them an adequate competitive/survival advantage. Here in New York, pretty much all unprotected 3-4' high oak seedlings will have been browsed numerous times by deer, if not killed outright by repeated removal of their terminal shoots. Is this omission an oversight, or is deer predation of white oak seedlings less of an issue in other, more significant parts of its range?

I can't speak to whether this is an omission or oversight as these were all produced prior to my appointment to this role.

What I can speak to is this – without active forest management that creates openings for upland oaks to thrive, we will continue to see fewer and fewer seedlings and saplings on the landscape. This makes deer browse even more detrimental as there are fewer seedlings that might get "missed." We need to be managing our upland oak forests such that regeneration is so strong that the deer can't possibly browse it all. That's one side of the equation for success. Managing competitors, including deer, is the other.

Confronting this litany of challenges is a tall order—what strategies and specific practices has the WOI developed to confront this crisis?

It is a tall order. And I appreciate this question because it allows me to expound on some of the changes occurring within the WOI.

In its formative years, the WOI was a loose coalition trying to find its way forward – the science was there, the partnerships were there, but what could this group actually accomplish? The answer is that the WOI could develop and publish the "Assessment and Conservation Plan" that you referenced earlier. That plan brought the issue to light, including a spatial assessment, results of surveys, and so on. It then gave a run-down of management techniques that could be applied to successfully regenerate white oak. Many of these techniques can be found in the "Landowners for Oaks" series that you mentioned. This was all the "assessment" part of the plan.

The "conservation" part of the plan provides a vision for moving forward, including the removal of several barriers that were identified via the assessment. To begin work on this, several Forest Service Landscape-Scale Restoration grants were awarded to the WOI and its partners. This partially funded the continued development and operations of the coalition, but also provided funding to several states to implement on-the-ground pilot projects. Those included educational field days, landowner visits, white oak demonstration areas and more. As that was all getting underway, COVID struck.

Coming out of COVID, the idea was that the WOI was entering the "implementation phase" of its work. That said, the WOI does not have the capacity to do "on-the-ground work," nor should it as there are plenty of other groups, businesses, and programs doing that work. What we can do, however, is serve as advocates and catalysts for that work.

We do that in several ways. The most obvious is that we are seen by many as the "voice" of white oak management and conservation, and we take that role seriously. The more people who know about this issue, the more likely our goals will be achieved. We are also the bridge that connects the various networks out there who are focused on white oak research and management. We convene stakeholders around discussions pertinent to removing barriers, such as helping landowners learn about the importance of forest management and what resources are available to them. Recently, the WOI worked with Representatives Barr (KY) and Bera (CA) to introduce HR 55829 (the White Oak Resilience Act) and are nearing completion of a companion bill in the Senate with Senators McConnell (KY) and Durbin (IL). These bills direct the Forest Service and the Natural Resources Conservation Service to prioritize upland oak management, create demonstration areas, and increase nursery capacity, among other things.

Based upon your short tenure as WOI executive director, what is your current prognosis of the most likely future of Quercus alba in 50 years? 100 years? Can adequate steps be taken to ensure adequate regeneration? Are we acting in time? And with enough urgency?

The FIA data shows that there are relatively few acres of seedlings out there today and the only way to increase that number over time is to create the conditions necessary, across more acres, for white oak seedlings to survive and thrive. To do that requires everything we have been talking about so far – educating landowners, removing barriers, actively managing forests, creating markets, and so on.

We have the tools and we know what needs to be done to adequately address this. But the reality is this – we can't magically go out there and create more acres of more mature trees with a snap of the fingers. So, we must do the work today to ensure that the ecological benefits of white oak remain in the ecosystem and that the next generation has a sustainable supply of white oak to meet its needs, too.

Given that this is not an immediate fix, but rather will take decades, I think we need to be realistic – there will be a "bottleneck," and it will likely start in the next decade or two, with it really being felt in the decades that follow that. How long that will last is the real question, and our collective urgency in addressing this issue will have a direct impact on that. Is it realistic to think that we will do everything we need to do in the next few years? No, and that's why the WOI exists – to keep the focus on this issue as we convene stakeholders who are all pursuing the goal of sustainable upland oak management, to connect groups who can learn from one another or leverage resources, and to collaborate with universities, businesses, landowners, and more to support their efforts in this realm.

For those of our readers/members who are interested in learning more about the White Oak Initiative, or in getting involved with your work, who should they contact? Where can they look for more information?

Our website – www.whiteoakinitiative.

org – is the best way to learn more about our work. We also have social media profiles that people can follow. I'm really excited to share that we will be reframing our website in the coming year to not only tell the story, but become a repository of resources for landowners, foresters, loggers, and researchers, essentially becoming a "one stop shop" for information related to upland oak management and regeneration.

I like to point out that the WOI operates on a large geographic scale, and therefore, we don't always have the answers to questions that are location-specific, such as "Where can I find oak trees to buy?" or "I have 20 acres of oaks that I don't know what to do with." In many of those cases, they can reach out to a local professional forester (the Society of American Foresters lists Certified Foresters on their website) or they can call their local NRCS service center for guidance that may be more specific to their needs.

But other than that, I'm always happy to hear from people about the work they are doing or questions that they have!

Thanks again Jason, and best of luck with your efforts to preserve white oak for future generations.

Wild Things in Your Woodlands

By Jessica Park

Coal Skink (*Plestiodon anthricinus*)

Coal skinks are stout, short-legged lizards with stripes that run laterally along the body. They usually grow to be between 5 and 7 inches in length and are mostly light brown. The thick dark stripe on the side of the body is framed by thinner, light stripes. Their tails, which can drop during pursuit by predators, are blue to grey in color depending on age. The males can have reddish markings on the sides of their heads during the spring breeding season as well.

Hatchlings have bright blue tails that fade as they get older. The northern subspecies are otherwise striped like adults while the southern subspecies' young have mostly black bodies.

The coal skink (*Plestiodon anthricinus*) is one of the three lizard species native to New York State and is endemic to the United States. The northern subspecies (*Plestiodon anthracinus anthracinus*) is found in western New York, Pennsylvania, and in isolated communities throughout the Appalachians. The southern subspecies (*Plestiodon anthracinus pluvialis*) is found further west, along the Gulf coast to eastern Texas. The southern variation is usually more spotted in appearance compared with the northern counterpart. The two subspecies are also documented to have mixed communities in parts of Alabama, Georgia, North Carolina, and Tennessee.

Coal skinks are relatively uncommon throughout an already restricted range, but they are usually found at higher elevations. Early successional, moist woodlands with lots of leaf litter and logs, or rocky slopes with loose stones to hide under are the preferred homes of these lizards. They can also be found near water sources such as springs, creeks, and swamps. In these habitats, they are known to swim to seek safety from predators under rocks and other debris in shallow water. Especially for New York populations, it is common for coal skinks to live in dry, open areas adjacent to or within a moist forest or swampy habitat.

Speaking from experience, coal skinks are lightning-fast creatures, using their speed to avoid predation (and curious amphibian and reptile enthusiasts), or to hunt small invertebrates. Spiders and insects make up most of their diet, but they have also been seen eating earthworms. They are most active in the warm months between April and October. Coal skinks mate in late spring or early summer before the females lay clutches of 5-10 eggs, usually in shallow, moist depressions underneath rocks. The females will remain with the eggs to protect them until they hatch 4-5 weeks later. The young, sometimes called "scorpions" are usually around two inches long and have blue tails. In New York, where only the northern subspecies is found, the young otherwise look like miniature versions of the adults.

While more research on coal skink population stability is underway, it is believed that they are threatened primarily by habitat loss. The

continued on next page

degradation and fragmentation, as well as natural ecological succession of the wooded areas that coal skinks prefer can restrict habitat for them. Since they prefer open areas and slopes within forests, an increase in woody cover as forests mature can make the habitat less suitable for them. Additionally, the establishment of roads and croplands in coal skink habitats can split up populations and contribute to the destabilization of the species in that region.

However, there are a few easy management practices that can help promote the health of coal skink populations within their range. Leaving logs, stumps, and other debris on the land can provide cover for coal skinks to hide and breed in. Additionally, in regions where coal skink populations are known to exist, it is vital to maintain the water sources that they rely on, including ephemeral pools, springs, and streams. Research has also pointed to intermittent habitat disturbance as a possible way to protect the open areas that coal skinks tend to thrive in. As the forest trends toward higher successional states, removing some of the cover—especially woody invasives—can help to preserve pockets of optimal coal skink habitat. With a little bit of help from responsible landowners, these elusive but charming lizards can continue to call New York State their home!

Jessica Park is a Program Assistant for the New York State Master Naturalist Program, directed by Kristi Sullivan at Cornell University's Department of Natural Resources and the Environment.

More information on managing habitat for wildlife, and the NY Master Naturalist Volunteer Program, can be found at https://blogs.cornell.edu/nymasternaturalist/

Photo credit: Ricardo Cruz

Would you like to receive an electronic version of future editions of *The New York Forest Owner*? If so, please send Claire an email (info@nyfoa.org).

You will receive an email every two months that includes a PDF file of the publication. While being convenient for you – read *The Forest Owner* anytime, any place – this will also help to save the Association money as the cost of printing and postage continues to rise with each edition.

Would you like to see an article about a particular topic we haven't covered?

Please send your suggestions to:
Mary Beth Malmsheimer, editor at
mmalmshe@syr.edu
or
Jeff Joseph, managing editor at
jeffjosephwoodworker@gmail.com

From the Executive Director (continued)

that. In the past, and still today, we have successfully relied on peer-to-peer efforts to recruit new members. It was probably easier to recruit traditional landowners because the local "rural network" fostered those connections. But many of the new landowners are not part of the local network, making them more challenging to connect with; their passion for their woods, however, is no less than any of ours, making them eager candidates for membership in NYFOA. They just don't know it yet, because they don't know that we're here.

So this sets the stage for me to circle back to my opening question: Why did you join NYFOA? Did someone get you excited about the organization, motivating you to join? Perhaps the more important question to ask at this point is, why have you remained a member of NYFOA? Has it met your expectations? We would like to know the answers to these critical questions to arm ourselves and to develop tools for others that can help recruit new members. While I have been successful at engaging with landowners and sharing the good news about NYFOA, I have not been alone in this effort; I have witnessed some of you in action too — watched how you shared your personal experience to connect with and recruit new members. It is effective. Whether you realize it or not, your story is a powerful way to connect with other landowners and is an encouragement for them to join.

At some point soon, we will be contacting you by email with a brief survey with these and other questions to help us understand how you have benefited from being a member of NYFOA; we also want to understand the types of programs and initiatives that motivate you to participate and remain a member. We believe this will help us develop and improve our value proposition which will help our effort to recruit new members. We would appreciate it if you would take a moment to respond when you get the survey.

It is a critical time for NYFOA and its mission continues to be ever important. But sustaining and increasing our membership is critical to our success and capacity as an organization. We are committed to explore opportunities to increase our exposure so landowners know that we exist, but every one of us can help in this effort too. Every one of us can be an ambassador to find and recruit others, and one of the best ways you can support the organization is simply to share your story. It is more powerful than you think in encouraging others to join. At a time in our culture where people are not the joiners that past generations were, there are many landowners out there that share your passion for their woods and who will join NYFOA if given the opportunity to learn who we are. I've seen it happen. If every one of us were to recruit just one more member, we would double our membership... instantly. Wouldn't that be something? Go share your story. Help your NYFOA achieve this important goal.

Until next time...go to the woods — take it all in and love it until you can't.

–Craig Vollmer
NYFOA Executive Director

Member Profile: Wayne Forrest

Coordinated and edited by Jeff Joseph

Please provide a brief background on yourself, including your age, and how your life and family relate to your property (where you're from, current occupation, etc.).

I am 67 years old. I live in Gasport, NY with my wife of 42 years, Brenda. I retired in 2015 after a 36-year career in thermal system engineering for the automotive industry. I've always loved the outdoors from a camping and hiking perspective. Having been a Cub Scout and Boy Scout myself, to holding various leadership positions in the Boy Scouts of America have helped provide many outdoor experiences. I've been blessed to have climbed all 46 High Peaks in the Adirondacks as well as hiked the Northville Placid trail with my son. Although early on in our hiking career it seemed that our focus was on the peak or the destination, as time went on, we learned to "stop and smell the berries" along the way.

How much land do you own? How much of the land is wooded?

We own 84 acres total, with 33 of those wooded. 51 acres is leased to a local farmer for the production of corn and soy beans.

Where is your land?

In the town of Hartland, in Niagara County.

When did you take ownership of your land? Was it from within the family or outside the family? If outside the family, what attracted you to purchase that particular parcel?

In 2001 my mother-in-law June transferred over her family's farm land to my wife Brenda and her brother Fred. The property had been owned since 1934 by my mother-in-law's family. June provides us with the historical view of the property. She knows where all the remnants of old orchards, the swimming hole, the cattle crossing, the fence lines, the barn and the junk yard are. There is nothing better than taking June out on a side by side to tour her childhood playground to learn more and pick black caps.

What motivates you to engage in the active management of your woodlot?

Vogt Farm woods have become my retirement playground. It is great to see the impact the work I do in the spring and summer is having on the overall health of the forest. Since retiring I have also taken up archery. So come fall I enjoy the time I am observing the wildlife, the different tree species and groves as they change to their fall colors, the flow of the creek after severe rain, and developing a list of improvement activities for the next spring. In our woodlot we've seen mink, coyotes, red foxes, raccoons, woodchucks, rabbits, squirrels, deer, beavers, and muskrats. As for birds we've seen pileated, redhead, northern flicker, downy, and hairy woodpeckers as well as wood ducks, Canadian geese, owls, red-tailed hawks, and great blue herons to name a few.

Who participates in the management decisions and the actual work? Where do you obtain information to guide your decisions?

From a logging perspective: In 2016 it was apparent that the emerald ash borer was going to kill off all the ash in our woodlands. We contacted consulting forester Bruce Robinson to see what he thought we should do. Bruce suggested a timber harvest of the ash while they were still viable as sawtimber. He marked all the trees that should go, created an inventory, and sent it out for bids. In 2017 logging commenced with the harvest of 22K board feet of ash and 38K board feet total (including red oak, black walnut, hickory, among others).

From a forest management perspective: In 2017 we committed to a five-year Conservation Stewardship Program (CSP) project with the United State Department of Agriculture (USDA). In 2022 we renewed the CSP for another five years. The objective of the project is to re-establish the woods surrounding the creek so that the creek water is covered in shade and that nutrients in the runoff are captured in the soil. This required the elimination of invasive species such as honeysuckle and multiflora rose so that the regeneration of the overstory tree species would occur. It was also necessary to clear off any remaining ash poles that were not logged so they don't fall and crush the new seedlings. We've planted sycamore, tulip poplar, black walnut, butternut, maples (silver and sugar), Streamco willow, sandbar willow, nine- bark, winterberry and elderberry so far. This year we will be planting canoe birch, sugar maple, pawpaw, persimmon, and redbud. In general, we are trying to create a diverse habitat for a variety of wildlife to thrive in.

Describe the overall makeup of the land, the topography, water features (ponds, swamps), the surrounding landscape, etc.…

Most of the woodlot surrounds about 2800' of the east branch of Eighteen Mile Creek. The woodlot serves as a buffer to prevent the farming activity from adversely impacting the creek. It ranges from well-stocked with small sawtimber on the higher ground to understocked with variable size on the low ground. In addition, there is a small three-acre plot that stands across the tilled field that is well-stocked with medium sawtimber. There is an old sand pit in the middle of the woods that acts as a vernal pool in the spring. Total elevation change is less than 15 feet.

Describe the land's vegetation. Types of trees that dominate? Presence of and type of understory vegetation?

Dominant overstory species vary depending on the location. We have groves of black walnut, white oak, red oak, and hickory. Some orchard trees from 60 years ago are still hanging on and producing fruit in areas where large ash no longer exists. Since we've been killing off invasives we are seeing a resurgence in the understory of red osier dogwood and spicebush shrubs as well as regeneration of existing canopy tree species. The invasive battle never ends—I've recently started seeing small clusters of phragmites on the creek edge, and a neighbor had wisteria which is now running into our farm land.

Provide a summary timeline of your experience with the land since you bought

it. What have been your major projects? What did you learn during those projects?

In 2014 we discovered neighbors were timber trespassing for firewood, so we learned how to post the property boundaries and started the process of getting borders surveyed and marked.

In 2015 we began hunting on the property.

In 2016 we hired a consulting forester to manage a timber sale. I was not capable of determining which non-ash trees should be included in the sale to improve the timber stand as well as generate more bid interest.

In 2017 we signed up for a CSP project/ grant. The USDA has a wealth of information to guide you on how to engage in and complete different management practices.

How has the land changed since you bought it?

The property boundaries have been surveyed and paint marked. The trail system developed during logging has been graded and now mowed. Pedestrian foot bridges have been added to allow access to the north side of the creek. 200 cords of ash logs have been removed from the property, and there is still plenty of downed wood. The Town of Hartland serviced a drainage path into the property.

What is your biggest challenge when it comes to managing the property and the woods?

Resources—both financial and labor. I am only one person; I have to be realistic with what I can physically and financially accomplish in a season. I do get assistance from family and friends on big projects with labor and financial support through the Conservation Stewardship Program.

What are some things you have done to learn how to understand and manage your land more effectively?

I completed the Master Forest Owner (MFO) training program and The Game of Logging 1 and 2 training. I have taken woods walks with other forest owners to learn how they manage their woodlands. I read *The New York Forest Owner* and *Northern Woodlands* magazines, and attend seminars on topics of interest.

What advice would you give to other woodlot owners, or to those considering buying woodland?

It can be very rewarding if you've got the time to spend exploring the woods through the different seasons. Each season has different things you can learn. Winter is the season of the long view. With the leaves off the trees and the grasses matted down you can better see the topography of the land and it is easier to pick out old fence posts, old fence lines, wolf trees and wildlife trails. In the spring many species begin to display their unique buds or flowers. For example, spicebush flowers erupt like small popcorn along the stems. Once you understand how a species shows up you can better see how much of a particular species is present from afar. This is also the best time to apply any basal bark herbicides that you plan to use because the buds will allow you to confirm the target species and it is much easier to see down to the base before all the foliage is present. Summer time is overwhelmingly green, long views are gone, all species are fully leafed out and grasses are up. This is the time of year most tree identification guidebooks are tailored for. In the fall you can use the changing leaf colors to help gauge the size and location of various species. For example, bitternut present yellow elliptical leaves and catalpa's big heart-shaped leaves turn a shade of yellow before they drop early in the fall. Get out there and enjoy your woods year-round!

As part of a grant funded habitat enhancement plan, Wayne has planted a variety of trees and shrubs along the branch of Eighteen Mile Creek that runs through his property.

In what ways, if any, do you interact with your neighbors or community as it relates to your woodlot?

We do not live on this property, so it is important to have good relationships with the adjacent neighbors. Plowing a snow-clogged driveway with our tractor for a neighbor or clearing a few downed trees for them is a small price to pay to get a phone call if someone they don't recognize starts walking into our woods.

Which NYFOA chapter are you affiliated with? How has membership in NYFOA benefited you as a woodland owner?

Niagara Frontier Chapter. Through the chapter I have met other forest owners locally who are knowledgeable in forest management. Our chapter hosts numerous woods walks. Participating in these walks over the years has helped me learn what other forest owners are doing with their land.

Woodland Health

A column focusing on topics that might limit the health, vigor and productivity of our private or public woodlands

Coordinated by Mark Whitmore

Preventative thinning for Enhancing Forest Health and Resilience

By Jessica Cancelliere

Throughout my 14-year career with the DEC, the task of safeguarding our forests has dramatically evolved. Invasive species and climate change have emerged as the most significant threats to forest health. When combined, their impacts are magnified, posing new and complex challenges for land managers. The rate of invasive species introductions continues to increase. Concurrently, climate change facilitates the survival and spread of these species and leaves forests increasingly stressed and more susceptible to invasion. In recent years, impacts have grown more pronounced. Invasive species often advance faster than anticipated, giving us little time to respond while outbreaks are small. Given these challenges, it is es-

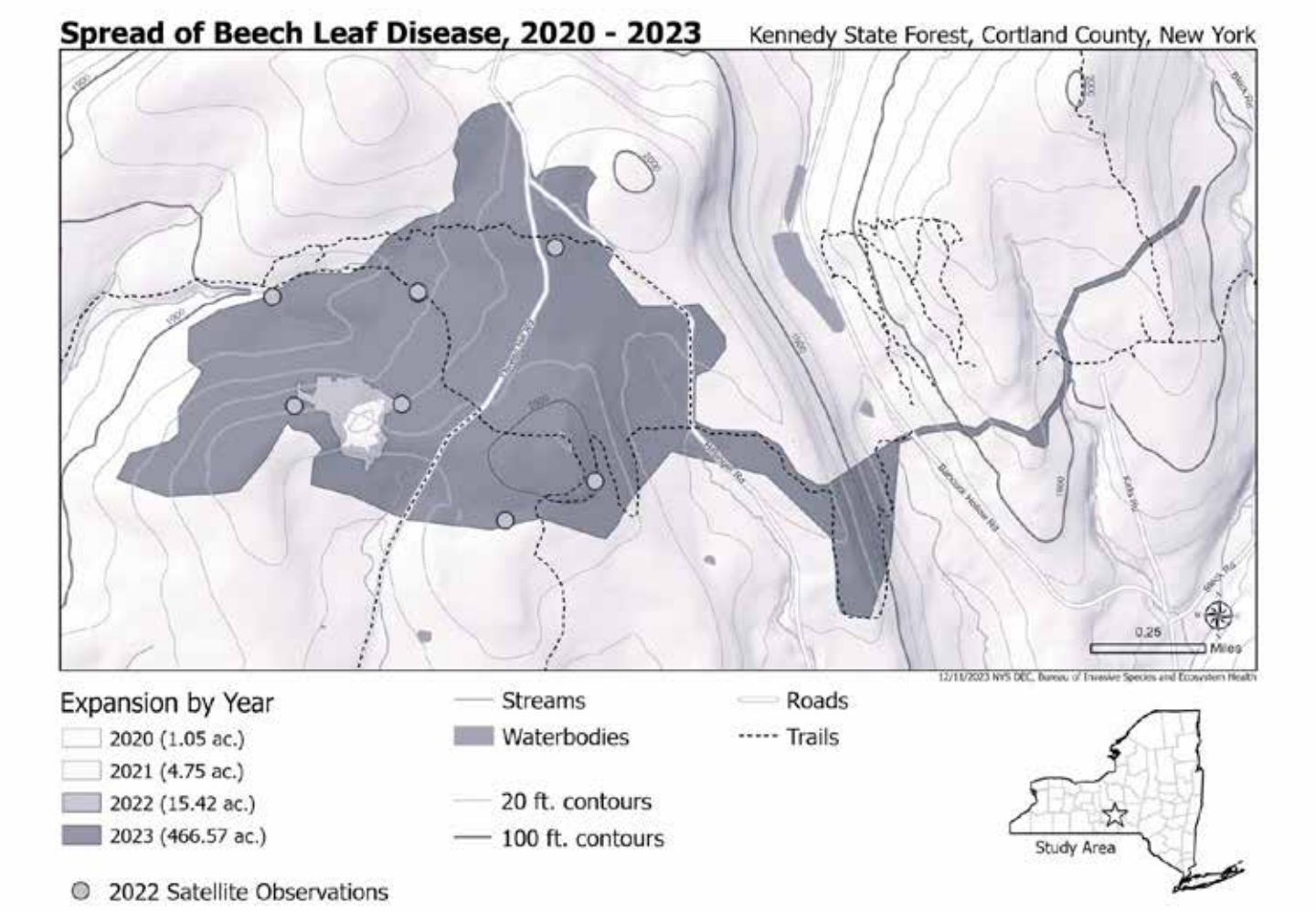

Figure 1. Spread of BLD at Kennedy State Forest in Cortland County NY. Figure credit: NYS DEC Forest Health.

sential that we adopt preventive measures to make our forests more resilient against these disturbances.

Stand thinning is essential in forest management because it increases sunlight, improves air circulation, and reduces competition between trees, promoting healthier and more resilient forest ecosystems. It is also one of the most effective tools in mitigating damage from invasive species and climate change. Forest pests and diseases often thrive in high-density conditions, where they can spread rapidly and take advantage of trees weakened from competition. Changing weather patterns in the Northeast have altered precipitation patterns and intensified drought. While overall precipitation may increase, it often occurs in short, intense bursts rather than being evenly distributed, leading to prolonged dry periods that stress and weaken trees, coupled with intense rainfall events that waterlog roots and favor the growth of foliar diseases.

Foliar diseases infect the leaves or needles of trees, their spores dispersing long distances via wind and rain. Milder winters and warmer, wetter springs associated with climate change are increasing foliar disease outbreaks. We've seen an increase in recent years of things like oak anthracnose, maple leaf spot, and powdery mildew to name a few. Foliage diseases on conifers have been particularly problematic. Conifers cannot refoliate like hardwoods and depend on several years of foliage, so they are more impacted when they lose needles. Site factors also play an important role in disease severity. Dense or pure stands, or conifers planted "off-site" are more sensitive to infection.

Stand thinning can directly reduce the severity and spread of fungal foliar diseases. Fungi cannot thrive without sufficient moisture and specific light conditions, so when sunlight and air circulation are increased, disease severity decreases. White pine needle damage (WPND), a needle disease that emerged on the landscape around 2012, is a good example of a foliar disease that can be managed with preventative thinning. It is a complex of several native fungal pathogens that after infecting needles, cause discoloration and premature needle drop in May and June. These fungi have existed in our forests for millennia, but remained relatively harmless until altered precipitation patterns

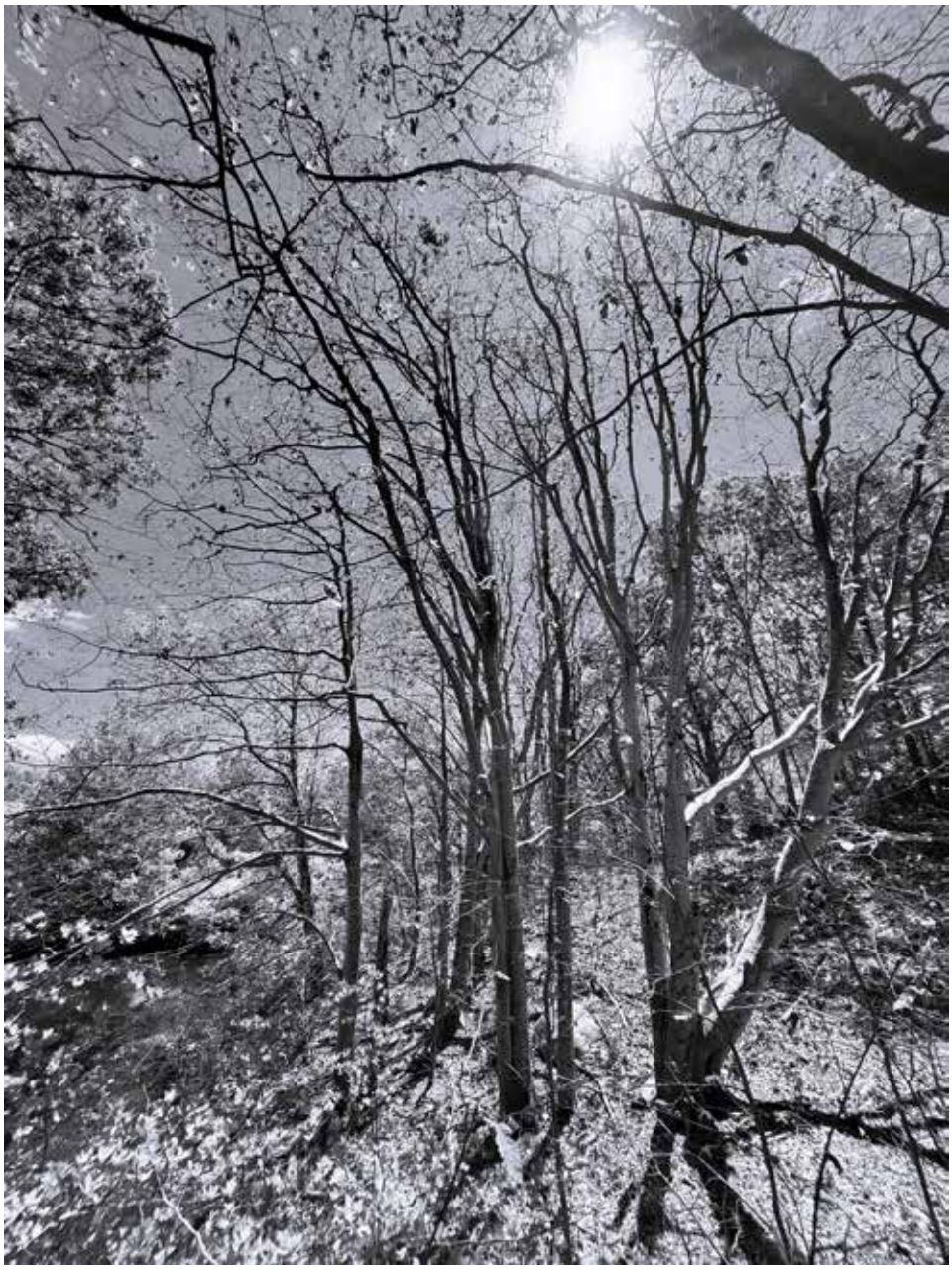

Figure 2. A beech stand on Fishers Island, New York with over 90% bud death in the spring. There is a thick beech understory that is not even visible due to lack of leaf out. Photo credit: NYS DEC Forest Health.

favored their growth and spread. White pines are maintained at relatively high densities across New York, exacerbating the impacts of WPND. Reducing total basal area has shown to reduce the severity and spread of the fungal inoculum that causes WPND. A USFS study in New Hampshire showed that thinning rapidly improved tree health and reduced WPND severity by 35% in low-density residual stands. In fact, many of the pests and diseases that impact white pine can be mitigated through silvicultural practices. A field manual for managing white pine is available online that describes recommended methods. *https://extension.unh.edu/resource/field-manual-managing-eastern-white-pine-health-new-england*. The same concept applies to other conifers and hardwoods, as well as trees planted in landscape settings. Keep ample spacing between trees and prune infected or dead branches to increase air flow within the tree canopy.

Sometimes good forest management is the only tool we have available to manage impactful invasive species. A case in point

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Figure 3.A white pine stand thinned on state land in Saratoga County to promote health and regeneration. Photo by NYS DEC Forest Health.

is beech leaf disease (BLD), a relatively new and highly destructive disease affecting native and ornamental beech trees. Its rapid spread across New York and the Northeast has been concerning, and currently no treatment options exist for large, forested settings. The disease is linked to a non-native nematode, *Litylenchus crenatae* ssp. *mcannii* that infects the buds. Symptoms emerge in leaves at bud break. Dark bands appear between leaf veins, and as the disease progresses, leaves curl, develop a leathery texture, and may prematurely drop from the tree. High levels of infection result in significant bud death, often as high as 95% at bud break, transforming a typically dark, cool, moist microclimate into a bright, arid environment unsuitable for shade-loving species.

BLD is primarily spread through wind, rain, and birds. Once introduced into a stand, symptoms progress at an alarming rate, starting in the seedling and sapling layer and first appearing in the overstory on the lower branches of trees. An infestation on state forest land in Cortland County spread from 1 to almost 500 acres over a three-year period (Figure 1). At present, there hasn't been significant mortality documented from BLD, but we are nearing a critical threshold and expect mortality rates to sharply increase. Trees may be able to withstand an infection for a long period of time, but inevitably will succumb to the physiological impacts and repeated defoliation caused by BLD. The loss of beech will lead to significant changes in forest composition and structure, and will negatively impact wildlife populations that rely on the nutrient-rich nuts it produces.

There are several forest management strategies a landowner can take to buffer the impacts of BLD.

1) Conduct moderate, repeated stand thinnings to reduce tree density and reduce moisture levels in the stand that favor BLD spread. Single-tree and group selection silvicultural methods that promote species and structural diversity while reducing competition can benefit tree health, especially in drought-prone stands. Greater size diversity promotes benefits such as reduced radiation, soil temperatures, wind speed, and better microclimatic buffering. It's useless to try and selectively remove BLD-infested trees, but removing trees riddled with beech bark disease could go a long way in improving overall stand health.

2) Control invasive plants in the understory and promote regeneration of native tree species, particularly other mast-producers, to avoid invasive encroachment and loss of forest and ecological functions. In areas with high beech bark disease pressure and dense beech thickets, BLD-caused mortality of thickets may allow for previously suppressed native species to regenerate, as long as deer browse is controlled.

3) When dominant or intermediate healthy beech is present, beech thickets should be controlled to protect the vertical movement of nematodes from the understory to the overstory.

While direct control of invasive pests and diseases will always be an important part of forest health, interactions between invasive species and climate change have complicated management. Even when eradication or suppression is successful, our forests remain vulnerable to threats. Implementing good forest management practices can help landowners buffer the impacts of these threats, preserving the health and diversity of forests. Although we face ecological uncertainty, we still have some control over the fate of our forests and should use it to the best of our ability.

Jessica Cancelliere is a Research Scientist and Section Chief, DEC Forest Health Program, Albany, NY.

Mark Whitmore is a forest entomologist in the Cornell University Department of Natural Resources and the chair of the NY Forest Health Advisory Council.

Welcome New Members

We welcome the following new members (who joined since the publishing of the last issue) to NYFOA and thank them for their interest in, and support of, the organization:

Name	Chapter	Name	Chapter
Jeffrey Andrews	CNY	Gregory and Frederick Muller	WFL
Willy Bemis	SFL	James Notaro	NFC
Ronald Cej	SOT	Scott Perkinson	SAC
John Colquhoun	CDC	Chris and Julia Reedy	CNY
Bill Conn	AFC	Bruce Sattler	SOT
Anne Ferree	NAC	Chris Spinosa	CDC
Russell Freeman	CDC	Mary Trev Thomas	CDC
Kyle Gorham	CNY	Dan Wisnosky	SOT
Amber Guay	NAC	Bong J. Yoon	SOT
Steve Marcus and Gail Wechsler	WFL		

NYFOA E-NEWS

NYFOA is excited to resurrect it's digital newsletter, and relaunch it with a new format and purpose.

This will be an important tool for us to disseminate timely information and updates, action alerts, or interesting content to the membership.

It will be put out as needed, not on a formal schedule, so watch for it to hit your email inbox periodically; if it shows up, it's probably about something we think you should know. If you want to make sure you or another partner in your family membership gets the E-News and are not sure if we have your email address, **please email us at info@nyfoa.org** to request being added to the distribution list.

The Wood in Your Woods: White Oak

By Jeff Joseph

In his widely read *A Natural History of Trees*, Donald Culross Peattie called white oak the "king of kings" among all the trees in the eastern U.S. He also claimed it to be the "best all-around hardwood in America," which is high praise indeed, and debatable perhaps, considering the wealth and diversity of our timber resource, but it does truthfully reflect the great versatility and utility of the lumber of this venerable species.

White oak is a long-lived but slow growing tree, putting on no more than an average of 1.8" in diameter in 10 years across its range. The wood of white oak is coarse-grained, hard, and heavy, weighing in at 47 lbs. per cubic foot when dry. The coarseness of grain is due to its ring-porous growth habit, with each annual ring made up of a pale and narrow earlywood section (with these early pores often large enough to be seen with the naked eye) followed by a wider and darker band of tightly packed latewood pores accumulated later in the growing season. These alternating bands are clearly visible—and tactile—on both the end- and face grain of white oak boards (Figures 1, 2). The majority of the cross-section of a white oak stem is heartwood, with only a relatively thin outer band of pale sapwood just inside the bark. The heartwood ranges in color from varying shades of tan to light brown. Freshly cut oak has a distinctively strong and rank odor (though many find it pleasant), due to the presence of tannins in the wood and bark. Once the wood has dried the odor becomes very faint.

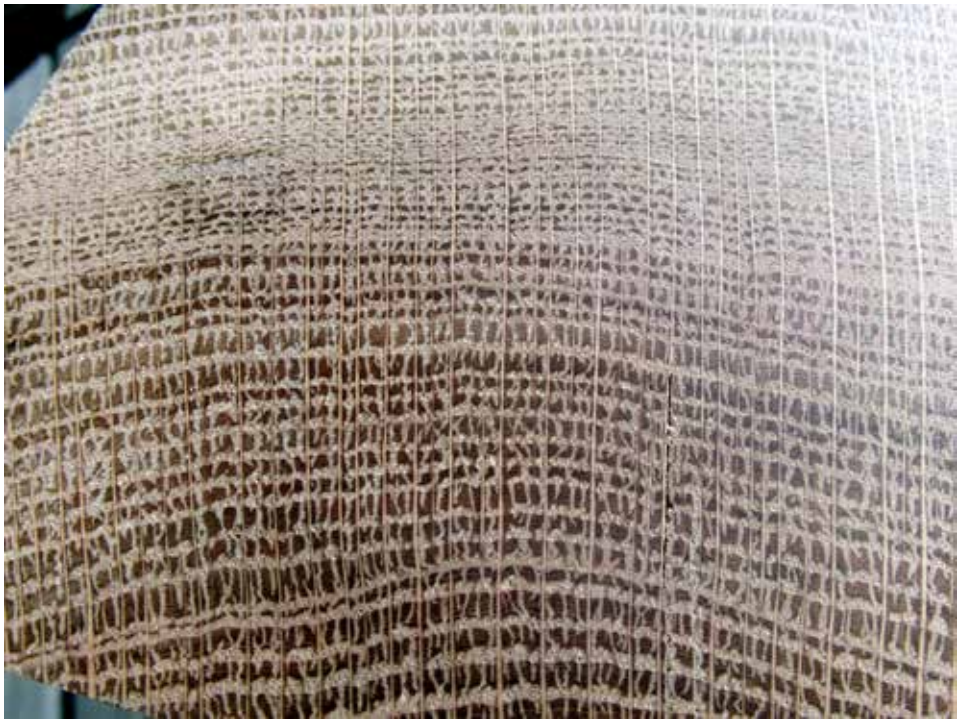

Figure 1. White oak endgrain close up---the horizontal lines are the growth rings, divided into the light colored, large-pored earlywood, and darker, wider bands of more densely packed latewood. The earlywood pores are large enough to see with the naked eye. The narrow vertical lines are the medullary rays, which function to transfer water, minerals, and other substances laterally in a hardwood stem. All photos courtesy of author.

A unique feature of white oak anatomy is the development of tyloses, which are bubble-like structures that fill the elongated vessels of the xylem. These vessels—also simply known as pores—are longitudinal tubes that transport water and sap from roots to leaves during the conversion of sapwood to heartwood. These tyloses, which effectively block the movement of moisture, can be clearly seen in the earlywood pores of white oak endgrain with a hand lens. This restriction of water movement is what makes white oak lumber so prized for barrel making, as the plugged pores allow it to hold liquids without leaking (tight cooperage), and which gave the species the alternate name of 'stave oak.' By contrast, red oak (*Q. rubra*), lacking tyloses entirely, allows air and moisture to move through its vessels so readily that a short piece of its wood can be used to blow bubbles in a cup of water like a straw. White oak is also prized for use in cooperage for adding subtleties of flavor and aroma to whiskey and wine during the aging process.

The lumber is very slow to dry, especially in stock thicker than 4/4 (1″ thick), and due to its large amount of volumetric shrinkage in drying (16.3%), and substantial variance between its shrinkage in the radial (5.6%) versus tangential (10.5%) dimension, is generally fairly unstable in use when exposed to fluctuations in temperature and humidity levels. Milling it as quartersawn (vertical grain) lumber helps to mitigate this problem, as the majority of the wood movement will then occur in the thickness of the lumber, rather than across the width of the board faces, which is much more problematic in most instances.

continued on next page

Figure 2. White oak, flatsawn face. Note the strong contrast between the early and latewood on both end and face grain. The medullary rays on this face are seen only as faint and narrow parallel lines. The wide pores in the early grain give oak lumber a characteristically coarse surface, even after sanding or planing.

Another highly distinct, if not defining feature of white oak lumber, and one that has been utilized to great aesthetic effect in cabinet and furniture making, is the presence of very prominent medullary rays on the quartersawn faces. The rays, which run at a right angle to the growth rings in a tree, and serve to transport water and nutrients from the center to the periphery of a hardwood stem, are cut in cross-section when quartersawing, and so show up on the radial faces as wide, ribbon-like crossgrain bands (Figure 3). On the flatsawn or tangential face of boards the rays appear as subtle, pale, parallel lines.

In use, white oak lumber glues well, bends exceptionally well, and stains and finishes acceptably, though staining will highlight the variance between early and latewood by accepting the stain unequally across the grain. Straight-grained boards plane well, and it sands to a fairly smooth surface, though even the sharpest of plane blades and finest grits of sandpaper cannot entirely remove the inherent coarseness of grain, which gives oak part of its distinctive 'personality' in use.

Uses of white oak lumber are many, ranging from the aforementioned tight cooperage, to furniture, cabinetry, veneers, flooring, tools and tool handles, structural timbers, railroad ties, shipbuilding, and much more (Figures 4, 5). As it is very durable in contact with both the soil and the elements, it is exceptionally well suited for outdoor use. To give a sense of its versatility, especially in the era prior to the widespread use of plastics, R. S. Kellogg in his *Lumber and its Uses*, published in 1914, listed 276 (!) distinct uses of white oak lumber. It is of course also an outstanding firewood, producing over 24 million BTU/cord.

Though until recent times white oak logs, timbers, and lumber were sold at a very reasonable prices with respect to their use and aesthetic values, concerns about future scarcity, and likely also greatly increased demand from the whiskey and winemaking industries, seem to have put an end to those days. According to the most recent Stumpage Price Report from the DEC, the price of white oak sawtimber (including veneer) averaged out to $480 per 1000 board feet across all regions of the state, with the highest price in the Western/Central region, which averaged $750 per 1000 BF. Astonishingly, these numbers place white oak in second place among all major commercial timbers in New

Figure 3. White oak, quartersawn face. Note the very prominent medullary rays running perpendicular to the grain direction of the wood. Quartersawing white oak, by cutting on the radial plane, creates lumber with 'vertical' grain, accentuating the rays in cross-sectioned bands in oak. The Arts and Crafts and Mission styles of furnituremaking have used this figure to great effect.

Figure 4. Its great structural strength combined with a high degree of rot resistance makes white oak a great choice for outdoor timber structures such as this porch in progress. Just be forewarned, freshly cut white oak is painfully heavy.

York, second to only black walnut, beating out both black cherry and sugar maple!

To corroborate this finding, I contacted my primary hardwood lumber supplier (in the southern tier) to ask about both current and past pricing, and the numbers corresponded neatly to those from the DEC. For kiln-dried 4/4 rough-sawn lumber, his current retail pricing is $8 per board foot for flatsawn white oak, and $10/BF for quartersawn. He also checked his pricing from 5 years ago, which showed cherry and hard maple at basically the same retail price now as then, while white oak has more than doubled in price. While this is a great boon if your woodlot is currently full of mature (or maturing) white oak, please plan in advance and take the necessary steps to ensure your stands regenerate successfully before cutting/selling, as we all want to continue to see healthy, viable populations of white oak in our woodlands well into the future.

Figure 5. The wood-bodied jointer plane in the foreground was made of a discarded white oak remnant from a timber framing project; in order to ensure its stability, the block used to create it was first rough-milled and left to air dry for over three years before being put to use.

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