



Kentucky

Volume 14 Issue 1

Woodlands

Magazine

Importance of White Oak

Actively Managing Your Woodlands for the Future

Tree Identification

Kentucky Woodlands

Volume 14 Issue 1 Magazine

Fall 2020

Promoting stewardship and sustainable management of Kentucky's family forests.

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Editors's Note: We are also pursuing the use of SFI paper produced on SFI certified and American Tree Farm System certified land.

From the Editors of the Kentucky Woodlands Magazine:

There are a lot of exciting things happening in the woodlands of Kentucky. Though this has been a rather challenging year for many as we continue to endure a global pandemic that is causing much uncertainty around us, we can be certain that our Kentucky woodlands will come out on top if we continue to practice sustainable woodland management. In this issue of Kentucky Woodlands Magazine, we discuss the importance of sustainable management and long-term strategic planning of your own woodland so that it too can endure the uncertainties that lie ahead. A critical part of enduring change is adaptive planning and having the resources available to conduct practices. This issue of the Magazine contains two articles, one by Jared Calvert, with the US Forest Service and Natural Resources Conservation Service and one by Dr. Jacob Muller with the UK Department of Forestry and Natural Resources that provides information on cost-share for woodland practices and adaptive management strategies to improve the resiliency of your woodlands. We also have articles covering a host of issues important to many woodland owners including how to select, prepare and plant food plots, new invasive plants, white oak tree improvement, and our Research-in-Brief department that highlights a study on the long-term benefits to crop-tree release in white oak stands. This issue also contain updates from the Kentucky Woodlands Owners Association (KWOA), the Kentucky Division of Forestry (KDF), and the Kentucky Tree Farm Program. We are particularly excited to share this issue of Kentucky Woodlands Magazine with you. Thanks for staying engaged with your woodlands! We hope you enjoy this latest issue!



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About the Cover:

The cover image was taken by Reneé Williams, Assistant Editor for the Kentucky Woodlands Magazine. It shows colorful fall foliage at Natural Bridge State Resort Park in Slade, KY.

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Fall foliage is beautiful at any angle.



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Understanding the Importance of White Oak

by Darren Morris and Jeff Stringer

Introduction

White oak (*Quercus alba*) is one of the most important tree species in the eastern United States. Most of us, regardless of whether we focus on wildlife, timber, or recreation, agree with this. There are many reasons to hold white oak in such high regard. White oaks are long-lived, easily living 200 years or more and some living to 600 years. White oak also happens to be one of the most widely distributed of all the oaks growing on a wide range of soils and sites. As a result, white oaks are often important landmark trees, having historical or cultural significance. The species is seen as a majestic and stable representation of our natural landscape, growing in cities and urban areas and their natural habitat in rural and secluded forests. Many have a personal association with white oak in some form or fashion.

Wildlife Value

The value of white oak is not solely related to how long it lives or its widespread occurrence. White oak has special characteristics which make it ecologically and economically important. White oak is significant for wildlife, providing food and shelter for both game and non-game wildlife species. Let's first consider the acorn. White oak acorns happen to be the most palatable of all the oaks. This is due to their relatively low concentration of tannic acid that makes other acorns bitter. While we would find white oak acorns distasteful, wildlife love them, and white oak acorns are a highly digestible source of food. This can be observed between the months of September through November, when acorns are falling from the trees. Many wildlife species like deer, turkey, squirrels, to name only a few, can often be found under white oak crowns scratching, raking, pawing, and digging through the leaves to get to the nutritious acorns. However, acorns are not the only source of food provided by white oak. The tender buds and new shoots of seedlings and saplings in the spring are perfect for browsing by deer. Even rabbits can be found eating young bark and twigs.



White oak acorns are a significant wildlife food. Because of their low concentration of tannic acid they are the most palatable of all acorns.

Oak tree photo courtesy: Renee Williams; Lumber and acorn: Darren Morris



White oaks provide significant habitat and places of hiding for a host of wildlife species. Mature trees develop cavities which can be used as dens by birds, squirrels, and raccoons, just to name a few. White oaks happen to be a favorite nesting tree of birds such as the near-threatened Cerulean Warbler that spends much of its time hopping around from branch to branch feeding on insects in the canopy of mature white oaks. The cavities and flaky bark of white oaks are also used as hiding places in the summer by forest-dwelling bats, some of which are federally protected. Because white oaks provide food and shelter to many different kinds of wildlife, the species is critical to the overall health of the ecosystem.

Forest Products and Industry

Most oaks are important providers of forest products, and white oak is no exception. In fact, white oak provides a wider range of products to the forest product industry than most other oaks. Lower quality white oak is harvested as pulpwood for paper production, small logs for manufacturing pallets and crossties for railroads, and the lower grade logs of all sizes for low valued No. 2 and 3 Common lumber.

On the opposite end of the spectrum, the pattern of the grain and color of white oak wood make it sought after for its use in manufacturing veneer, the highest valued forest product, and other valuable products such as furniture, cabinets, flooring, and other solid wood products with high-end uses. White oak also has wood properties that make it uniquely suited for manufacturing barrels used by the wine and whisky industries. The stave logs (staves being the vertical pieces of wood in a barrel) are full of tyloses, a substance that is unique to white oaks that plugs the wood cells and allows them to hold liquid for long periods of time, a characteristic that is needed for aging wine, whisky, and other spirits. Further, the charred white oak wood in a barrel contributes all of the color to whisky and bourbon and 70 percent of the flavor. All of these characteristics result in white oak being used by a large number of wood product industries, which creates steady competition for high quality white oak logs. For these reasons, white oak generally has the best potential to reach the highest value, compared to other oaks. This is another way white oak separates itself from the field, so to speak.

Regeneration and Growth Characteristics

Of course not everything about white oak is ideal. When it comes to managing white oak in our forests, there are some hurdles to overcome. For starters, white oak happens to be one of the slower growing of the upland oaks. Considering that oaks in general are slower growing than many of the tree species they commonly must compete against, white oaks are often at a disadvantage.

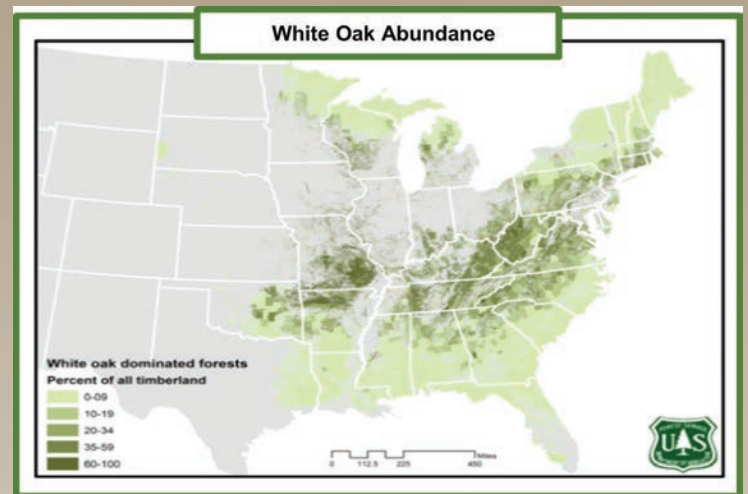


Because of white oak growth characteristics, white oak seedlings must be well established before they can take advantage of an opening in the canopy.

This means regenerating an upland oak forest after a timber harvest can prove to be difficult. In order to ensure that white oak has a good chance of becoming a part of the next forest stand, white oak seedlings need a head start. This means making sure white oak seedlings are growing in the understory prior to harvesting timber. This advanced regeneration is a key component of upland oak forest management.

An important factor in establishing regeneration is acorn production. This brings up another characteristic that makes managing white oaks in forests difficult. It turns out that

most white oaks only have good acorn producing crops every few years. Further, it is necessary for acorns to make direct contact with the soil. If they lie on top of the leaves, they can easily dry out or become wildlife food. However, if they are resting on the soil under the leaves or are buried by wildlife they stand a much better chance of successfully germinating and becoming a seedling. With a little luck, the newly established seedlings will soon receive enough sunlight through the forest canopy to continue to survive and grow, something that can be greatly aided by good forest management. An abundant number of seedlings, referred to as advance regeneration, must become established in the forest understory, ready for any kind of opening above. When an opening or thinning of the forest canopy occurs due to mother nature or through forest management, it can provide enough sunlight for the white oak advance regeneration to continue to thrive and outgrow its competition, eventually maturing to become a dominate tree of the forest.



Important to All

White oak is clearly an important component of our forests. Not only is white oak an important timber resource, it is possibly one of the most highly valued wildlife trees in the forests of the eastern United States. We also need to continue to see white oaks represented in our cities and urban environments. White oak is one of the most important trees in our upland oak forests. There are indeed many reasons to hold white oak in such high regard.

For more information about white oak and white oak management, contact: www.whiteoakinitiative.org

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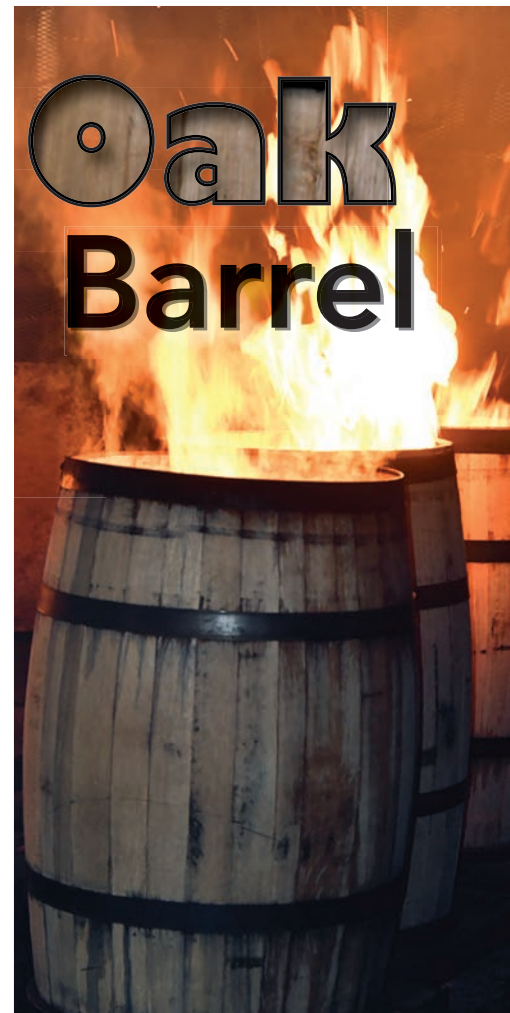
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A Certified White

Oak Barrel

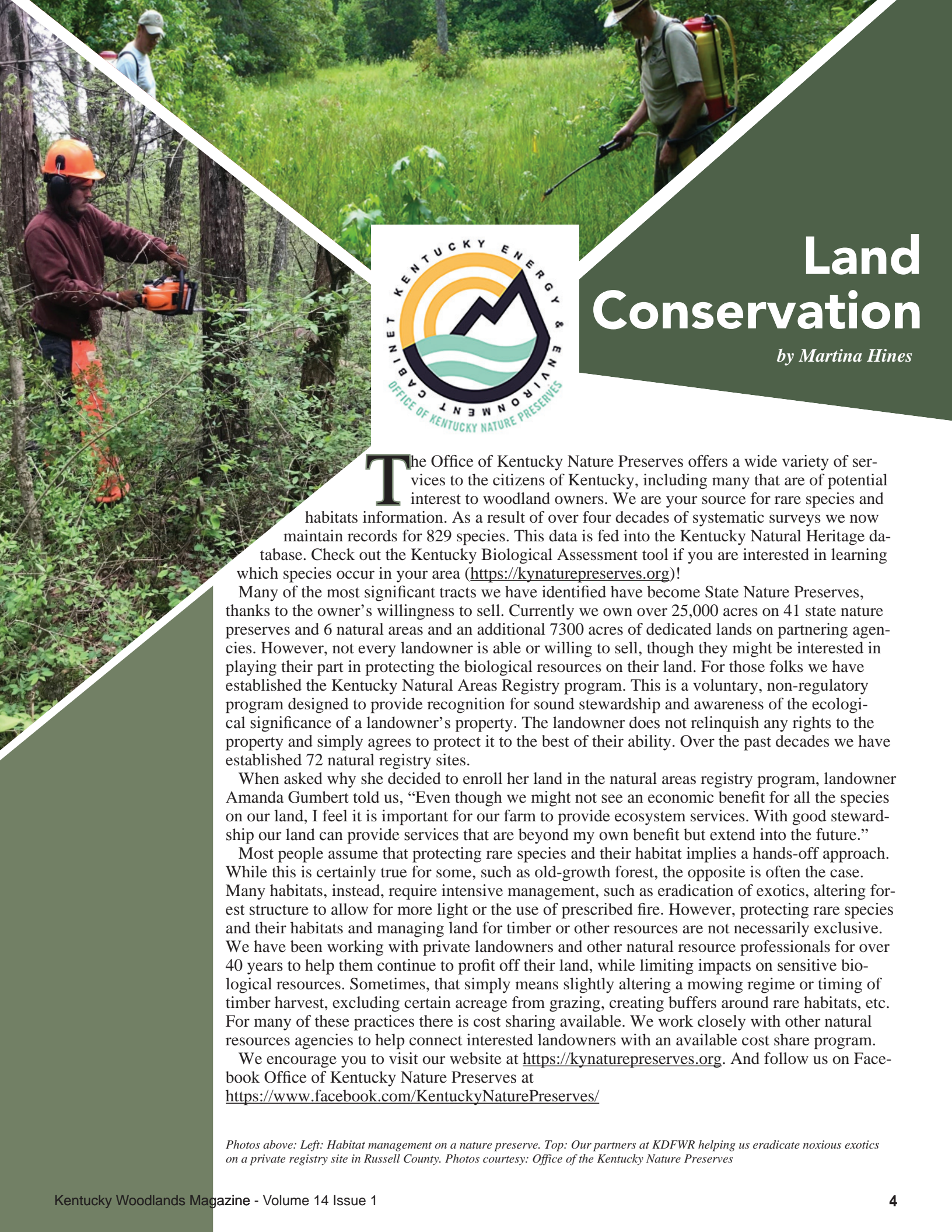


All photos courtesy: Renee Williams

What if bourbon, wine, and spirits could be aged in a white oak barrel that is certified? The end product consumer would be assured that each step of the entire pathway throughout the supply chain was certified. From the certified Tree Farm, where good forest stewardship is a priority, all the way to the distillery, the forest product can be tracked along all stages of processing and manufacturing by control systems set to document that the final product has a credible claim of chain of custody certified.

In one particular case, the white oak trees were harvested from the Taylor Tree Farm. As recent recipients of the Kentucky Tree Farmer of the Year award, the Taylors have a long history of practicing good forest stewardship. The farm was certified as a Tree Farm in 1972 with the goals of timber production and wildlife habitat management as well as recreation and aesthetics. There is also a specific focus on oak management, including oak regeneration and oak recruitment practices insuring healthy oak forests in the future.

This extensive effort in oak management, specifically white oak, is what attracted the interest of Irish Distillers. They could produce a white oak barrel using white oaks that were harvested from this certified Tree Farm where practicing good forest stewardship and maintaining the integrity of oak forests have been held in such high regard. The white oak trees were harvested and hauled to a certified mill, S & S Stave Mill, where they were processed into staves. The staves continued the journey to Kelvin Cooperage, where the certified product was assembled into white oak barrels. The barrels were then shipped to their final stop of Irish Distiller's "American Oak Project," as certified white oak barrels.



Land Conservation

by Martina Hines

The Office of Kentucky Nature Preserves offers a wide variety of services to the citizens of Kentucky, including many that are of potential interest to woodland owners. We are your source for rare species and habitats information. As a result of over four decades of systematic surveys we now maintain records for 829 species. This data is fed into the Kentucky Natural Heritage database. Check out the Kentucky Biological Assessment tool if you are interested in learning which species occur in your area (<https://kynaturepreserves.org/>)!

Many of the most significant tracts we have identified have become State Nature Preserves, thanks to the owner's willingness to sell. Currently we own over 25,000 acres on 41 state nature preserves and 6 natural areas and an additional 7300 acres of dedicated lands on partnering agencies. However, not every landowner is able or willing to sell, though they might be interested in playing their part in protecting the biological resources on their land. For those folks we have established the Kentucky Natural Areas Registry program. This is a voluntary, non-regulatory program designed to provide recognition for sound stewardship and awareness of the ecological significance of a landowner's property. The landowner does not relinquish any rights to the property and simply agrees to protect it to the best of their ability. Over the past decades we have established 72 natural registry sites.

When asked why she decided to enroll her land in the natural areas registry program, landowner Amanda Gumbert told us, "Even though we might not see an economic benefit for all the species on our land, I feel it is important for our farm to provide ecosystem services. With good stewardship our land can provide services that are beyond my own benefit but extend into the future."

Most people assume that protecting rare species and their habitat implies a hands-off approach. While this is certainly true for some, such as old-growth forest, the opposite is often the case. Many habitats, instead, require intensive management, such as eradication of exotics, altering forest structure to allow for more light or the use of prescribed fire. However, protecting rare species and their habitats and managing land for timber or other resources are not necessarily exclusive. We have been working with private landowners and other natural resource professionals for over 40 years to help them continue to profit off their land, while limiting impacts on sensitive biological resources. Sometimes, that simply means slightly altering a mowing regime or timing of timber harvest, excluding certain acreage from grazing, creating buffers around rare habitats, etc. For many of these practices there is cost sharing available. We work closely with other natural resources agencies to help connect interested landowners with an available cost share program.

We encourage you to visit our website at <https://kynaturepreserves.org>. And follow us on Facebook Office of Kentucky Nature Preserves at <https://www.facebook.com/KentuckyNaturePreserves/>

Photos above: Left: Habitat management on a nature preserve. Top: Our partners at KDFWR helping us eradicate noxious exotics on a private registry site in Russell County. Photos courtesy: Office of the Kentucky Nature Preserves

Actively Managing Your Woodlands for the Future

by Jacob Muller

As woodland stewards, we want to ensure that our woods are healthy, sustainable, and productive long into the future. We know that the management decisions we implement today will play out over years and decades to come, and many of those decisions may not be understood and valued until years down the road. Woodland management and stewardship require us to continually assess current growing conditions while also understanding that climate and forested ecosystems are not maintained by static processes. Because of this, we need to consider long-term management scenarios, and understand that in 50 or 100 years, our woodlands may look a little different than they do today.

We are still learning about future climate change in Kentucky and what it will mean for our woodland owners and forestry professionals. Climatologists and earth scientists use sophisticated models to simulate future shifts in the climate, while forest and landscape ecologists apply those models (and create new models) to determine potential effects on trees and woodlands. Most researchers agree that our woodlands across Kentucky will be affected by future climate change in one way or another.

In the decades to come, we will likely experience expanding growing seasons, longer and more intense fire seasons, increasing risk of flooding due to large episodic rain events, and more severe and impactful droughts across the state. This means that trees and woodlands will also be affected in the future, both directly and indirectly from shifts in the climate. In certain regions of the state, a longer growing season may actually increase productivity and profitability of your woodlands. In fact, many tree species in Kentucky are already seeing a longer growing season by a week or two. However, longer growing seasons may also mean there is potential for adverse effects to our woodlands. One particular concern of forest health experts is the potential for invasive insects to complete multiple life cycles in one year, thus increasing their spread and compounding our mitigation efforts. Additionally, milder winters may also mean that many insect pests are able to survive year around, creating multi-year outbreaks. All of these things act together to amplify insect damage and make pest control more difficult and expensive.

The impacts of climate change will not be evenly distributed across the Kentucky landscape. Western Kentucky woodlands

face different risks than eastern Kentucky woodlands. However, regardless of forest and woodland type, we can utilize specific adaptation approaches and options to help us all prepare for the future. Using the adaptive management framework (Figure 1), we can conceptualize our management objectives and decisions in the context of a changing system. Additionally, we can implement a range of adaptation strategies in our woodlands to help us prepare for the future, such as focusing our efforts on increasing species and structural diversity, being proactive to protect our woodlands from current and future invasive pests, and, ultimately, engaging in active, adaptive management approaches to woodland management (Figure 2).



Figure 2

This information isn't intended to cause worry or cast doubt on your ability to sustainability manage your woodlands. We know your woodlands are a valuable resource for you, your family, and perhaps your business, and we want to help you plan for the future. We can all work together to address this challenge by actively managing our woodlands. With some foresight, planning, and preparation, you can help ensure a healthy, productive, and sustainable woodland for generations to come. If you would like more information on this topic, please reach out to UK Forestry and Natural Resources Extension.

For additional resources, see:

<https://adaptationworkbook.org/>
<https://doi.org/10.2737/NRS-GTR-87>
<https://www.doi.gov/sites/doi.gov/files/migrated/ppa/upload/Chapter1.pdf>

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FOREST

New Invasive Plants to Watch For

by Ellen Crocker and David Taylor

Invasive plants are a threat to the health of woodlands throughout Kentucky and can interfere with your management goals. The term “invasive plant” refers to those that are non-native (introduced from some other part of the world) and which cause economic or ecological problems. These unwelcomed plants can rapidly take advantage of disturbances like harvests or the loss of trees due to emerald ash borer. Promoting the health of your woodlands means managing these damaging species.

While there are many invasive plants already established in Kentucky, there are several new species on their way that you should be on the lookout for. Catching these before they widely establish on your property is much easier than trying to manage them once they are widespread. So, keep your eyes peeled for these (and get rid of them quickly if you find them).

Japanese chaff flower

The threat? This herbaceous plant from Asia grows in very dense stands, excluding native plants. While it is especially problematic along large rivers with floodplains, it also invades bottomland woodlands, roadsides, and field edges. It produces many seeds which can be easily transported in the fur of animals, on clothes and by water or in soil.

How to ID?

- Form: Perennial plant 3-6 feet tall with an extensive root system producing many loosely branched stems.
- Leaves: Opposite and simple, with smooth, wavy margins, and red tinted stems where leaves attach.
- Flowers & seeds: A spike of non-descript flowers without petals elongates and develops over the summer into seeds with stiff hairs.



Photo courtesy: Chris Evans, University of Illinois, Bugwood.org

Where is it now? It has already invaded all along the Ohio River and parts of the Red River. It is likely that this will

spread rapidly in the near future, particularly along waterways.

Mile-a-minute weed

The threat? This annual herbaceous vine grows very fast and can carpet the ground and grow over native plants, reducing their vigor and killing plants over time. While small patches can be easily pulled up (beware of the sharp barbs on stems), controlling larger areas is a major challenge.



Photo courtesy: Leslie Mehrhoff, University of Connecticut, Bugwood.org

How to ID?

- Form: Annual vines, typically growing as a dense blanket of intertwining shoots.
- Leaves: Triangular leaves and distinctive thorns on stems that are curved downward. Where leaves attach to stems there is a round leaf-like structure that encircles the stem.
- Flowers & seeds: Flowers are green and easy to miss but they develop into berry-like fruit that mature to a metallic blue or purple color.

Where is it now? It is in West Virginia along the border with northeastern KY, and is likely to move into eastern and northern KY in the near future.

Chocolate vine

The threat? Chocolate vine (also called Akebia or Five-fingers) is a perennial, deciduous to evergreen vine that climbs over trees or carpets the forest floor. The vine also produces dense mats in shade which threaten regeneration of desirable trees and other plants in woodlands.

How to ID?

- Form: Stems of vines are green when young and turn brown (and woody) with age
- Leaves: They are compound with five leaflets in a whorl.



These leaflets are bright green on top and lighter green underneath.

- Flowers & seeds: The eye-catching purple flowers emerge in early spring. The large purple seed pods filled with white flesh and black seeds split open when ripe.



Photos courtesy: Leslie Mehrhoff, University of Connecticut, Bugwood.org

Where is it now? Chocolate vine is currently scattered throughout the state in several small pockets. There are known infestations in central KY and the Louisville area.

Lesser celandine

The threat?

Lesser celandine, also called fig buttercup, is an invasive spring ephemeral with eye-catching yellow flowers that resulted in its use as a garden plant. However, it escapes landscape



Photos courtesy: John M. Randall, The Nature Conservancy, Bugwood.org - Flower: Leslie Mehrhoff, University of Connecticut, Bugwood.org

settings to stream banks, floodplains, and wet woodlands, where it grows in a dense low carpet, and crowds out native plants. Its many small tubers make it hard to eradicate and promote spread downstream. Besides taking over woodland areas and contributing to erosion, the leaves of lesser celandine are toxic to livestock.

How to ID?

- Form: An herbaceous perennial that emerges in early spring, before most native plants. After flowering it dies down, spending the rest of the year dormant below ground. In large patches, the exposed soil increases erosion potential.
- Leaves: Shiny, dark green heart-shaped (or kidney-shaped) leaves, frequently blotched with lighter colored patches on their upper surface.
- Flowers and fruit: Glossy yellow flowers characteristic of buttercups in general. Formation of seeds is infrequent

in this area (propagation generally occurs via tubers or bulbils found at base of stems).

Where is it now? Lesser celandine is increasingly common along rivers and streams as well as in bottomlands in northern and central KY and scattered elsewhere in the state.

Other newer invasive plants to look for



Sweet mock orange
Photo courtesy: Ansel Oommen, Bugwood.org



European buckthorn
Photo courtesy: Chris Evans, University of Illinois, Bugwood.org



Porcelain-berry
Photo courtesy: James Miller, USDA Forest Service, Bugwood.org



Jetbead
Photo courtesy: Leslie Mehrhoff, University of Connecticut, Bugwood.org

Biggest risk for your area?

- Northern KY/Louisville - jetbead, lesser celandine, Japanese chaff flower, porcelain-berry, European buckthorn, chocolate vine
- Central KY - porcelain-berry, sweet mock orange, European buckthorn, lesser celandine, chocolate vine
- Eastern KY - mile-a-minute weed, European buckthorn, Japanese chaff flower
- Western KY - Japanese chaff flower, chocolate vine

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Food Plots: The Basics

by Matthew Springer

Photos courtesy: Matt Springer

Do I need a Food Plot for Wildlife?

Food plots can create great hunting and wildlife viewing opportunities, but before you put the time, effort, and money into creating one you should consider several issues. Wildlife require three essential components to survive—food, cover, and water. Ensuring access to all of these components either on your or neighboring properties is essential for successful for any wildlife management. These components can be broken down even further, and should be, if you want to manage for an individual species, but focusing on those three overarching components will help you be a successful steward to the wildlife on your property.

Food plots should be viewed as a part of a larger wildlife and habitat management strategy. If your strategy does not include habitat management outside of food plots, such as ensuring multiple stages of plant succession in the area to provide more food and cover, food plots may have little to no benefits, even being detrimental in some situations. The first question you should ask yourself when thinking about installing food plots on your property should be, why am I putting a food plot in? Follow up questions should include, “Are the animals I am managing for food limited?” and “Are there any other major survival components lacking that should/can be addressed?” These questions are really meant to make you think about a holistic management strategy. If you manage a farm with acres and acres of row crops, forest management and/or native grasslands may be more important to focus your activities on to increase cover and fawning/nesting/brooding areas than putting more food into the landscape.

Site Selection and Plot Size

If you come to the conclusion that food plots are a helpful management strategy, you should start taking stock of your property, the resources for planting and maintenance, and the locations that are available to install a food plot. There

are libraries worth of hunting articles on this topic, but in this article we will cover the basics to help you dive into it more if you so desire.

Taking stock of your resources and the size of the area(s) available to plant a plot. Then consider, the means you have to prepare and plant (tractor vs. ATV), which may dictate where or how large of a plot you can plant. If you live on flat ground with multiple options, the reason you are planting a food plot should dictate its size and placement within the landscape. If you are hoping to use this plot for hunting purposes, you need to consider how you will access the plot during hunting season. You will need a means to limit disturbing wildlife, roost areas, bedding areas, as you walk to and from the plot and will want to keep the plot smaller in size (<5 acres). If you are hoping to use it to feed or photograph wildlife, then placement and ability to see wildlife within the plot from say your kitchen window may start to outweigh other considerations.

Soil Testing and Remediation

Once you have selected your site, the preparation of the site is incredibly important to the success of the food plot. The first step in the process will be collecting soil samples at the site(s). A soil test will reveal the plots soil pH level and the nitrogen, phosphorus, and potassium levels in the tested ground. In most instances food plot site soils will require some level of nutrient correction, partially due to the locations tending to be in rough, secluded, wooded areas of the property. These nutrients can be applied in a variety of ways, from commercial agricultural equipment all the way down to hand tools. For more details on how to conduct a soil sample, please refer to the numerous extension publications that outline in detail the best practices for collecting soil samples. Refer to the University of Kentucky Extension publication Taking Soil Test Samples (AGR-16) or ask your County Agriculture and Natural Resource Agent for proper instructions.

What Should I Plant

Determining what you want to plant in a food plot seems like a simple decision, but there are dozens of options of plants, and many of them can be combined to create even more options, all of which can be grown successfully within Kentucky. When choosing what to plant, take a multiscale look at the area(s) you plan on planting the food plot. Think not only about immediate the area that has the food plot, but what is in the general area surrounding it for a few hundred yards. Based on your assessment of the area, select a plant(s) that will help meet any other goals of the plot. If you want to use the plot for hunting purposes, make sure the plants will attract the species you wish to hunt to the plot during hunting season. If you want to use the plot to feed wildlife, you may want to select a mixture of plants to grow in the plot. These mixtures can and should complement each other and will provide a variety of food options to the species that will use the plot. Think of it as a buffet rather than a one course meal. Avoid planting species that are considered invasive plants in Kentucky, as you may create a bigger problem than you initially expect. No matter what, though, we want to make sure we are not planting any species that are invasive, potentially opening the door to more problems later on!

Prep and Planting

The main steps of the planting process are straight forward, however the tools you have available will dictate how it is accomplished. First apply the necessary soil remediation based on results of the soil sample. Second prep the soil bed using one of the



Above: Multiple options exist for spreading both your soil amendments and seed. The most important thing is that you get equal coverage over the planting area.

Left: Choosing the correct amount of soil amendments is vital to food plot success.



Though it is not a necessity to plant a food plot, a disk and/or cultipacker can help increase soil to seed contact. This is a combination unit, but there are multiple versions in the market that can accomplish the same task.

completely prepped, apply seed to the plot. Make sure you pay close attention to the seeding depths and rates for your selected seed. If you have questions on methods to ensure your success when seeding, contact your county Extension agent.

Plot Maintenance and Monitoring

After planting plots you cannot simply walk away from a plot and expect success. Weed control is going to be a big concern, especially for newly established food plot areas. Routinely check your plots (stop by every couple of weeks) to ensure that you catch problems early. Use the appropriate methods (chemical or mechanical) to control weeds while minimizing the impact on the plants you want in the plot.

You should also monitor your plots for use and consumption rates by your

variety of ways to prepare your seed bed for planting. Tractors, ATVs, backpack sprayers, even a rake are all potential tools for seed bed prep and planting. The overall goal is reducing or eliminating competition from existing vegetation at the site by chemical (glyphosate) or mechanical (tilling/disking) means. This will help prepare the soil bed to plant the seeds and maximize the seed to soil contact needed.

After the seed bed has been

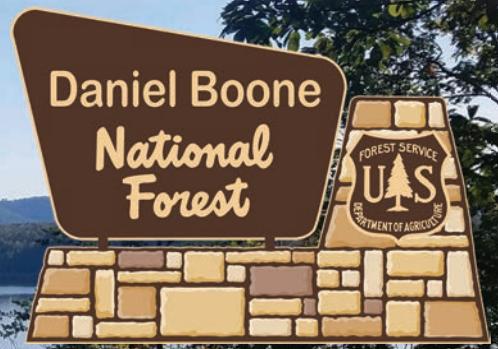
targeted species. The easiest way to determine the production of the plot is to set up a few enclosures within the plot to keep animals from consuming any plant growth allowing you to see how much is being produced versus consumed outside the plot. Pair this method with a trail camera and you will have a good grasp on how wildlife are using your plot and if changes are necessary. For more information on wildlife food plots, Dr. Craig Harper, Professor and Wildlife Extension Specialist at the University of Tennessee has an amazing resource on food plots: *A Guide to Wildlife Food Plots and Early Successional Plants*. Craig A. Harper. 2nd Edition. It is well worth its cost (~\$60) if you are really interested in installing food plots on your property.

About the Author:

Matthew Springer, Ph.D., Assistant Extension Professor of Wildlife Management with the UK Department of Forestry and Natural Resources works on a variety of wildlife management needs for private landowners, farmers, and governmental agencies.

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Frontier News



Shared Stewardship with the Daniel Boone National Forest

by Tim Eling, Staff Officer



A shared commitment in caring for the land

Among the greatest threats to Kentucky's forests are wildfires, non-native insects, drought and disease; scourges that have no respect for property boundaries as they spread across the landscape. To face these challenges, land management agencies and private landowners are coming together with a new strategy – shared stewardship.

The need to work across ownership boundaries is increasingly apparent as complex ecological disturbances threaten the sustainability of our natural resources and the economic productivity of our local communities. We are now rethinking our approach to land management and setting priorities to improve forest health on a landscape-wide scale.

What shared stewardship means for land managers

The 2014 Farm Bill gave the USDA Forest Service the ability to work cross-boundary through the Good Neighbor Authority (GNA). By June 2018, the agency had signed 163 GNA agreements on 59 national forests in 25 states to complete a variety of restoration activities. The 2018 Omnibus Bill further expanded the GNA and other authorities, enabling the agency to do even more work with state and private partners.

In Kentucky, the USDA Forest Service manages the two largest sections of public land, the Daniel Boone National Forest (DBNF) and the Land Between the Lakes National Recreation Area, which total more than 880,000 acres. The DBNF covers 80 percent of that total with national forest lands that extend across 21 eastern counties. These lands are highly intermingled with state and private, providing multiple opportunities to work across ownership boundaries.

Shared stewardship means sharing the work among partners, but more importantly, it means sharing in the decisions to effectively meet common goals and objectives," said Forest Supervisor Dan Olsen with the Daniel Boone National Forest.

Photos to the left: The Keno Shooting Range was reconstructed using a combination of DBNF recreation fees and a grant from the NWTF. The Pine Knot Job Corps Center and the Stearns District provided labor during the reconstruction.

Prescribed burning on the DBNF.

Log landing on the DBNF.

All photos courtesy: Daniel Boone National Forest



Working together for the greatest good

The DBNF is participating in shared stewardship through a variety of collaborative initiatives and partnership agreements.

The White Oak Initiative works to ensure the long-term sustainability of America’s white oak and the economic, social and conservation benefits derived from white oak dominated forests. Eastern Kentucky is among the white oak dominated forest regions of the eastern United States. As part of Kentucky’s White Oak Initiative, the DBNF is identified as a primary resource area for sustainable white oak populations. White oak forests provide critical food and habitat to many wildlife species. These healthy forest ecosystems then provide for recreational activities, like hunting, that generate billions of dollars for local economies. Additionally, white oak is the most commercially important timber oak throughout much of the Southeastern United States because it is ideal for industries making forest products such as bourbon barrel staves.

The Shortleaf Pine Initiative includes a host of partners working together to restore our native pine ecosystem. Beginning in 1999, a southern pine beetle outbreak resulted in extensive loss of mature pine forest across Kentucky. Other states experienced similar epidemic infestations of such severity that southern forests, once dominated by shortleaf pine forest types, have lost more than 50 percent of their native shortleaf pine acreage. For the citizens of the 22 states where shortleaf pine was originally found, these forests represent a wide range of cultural, ecological and economic values. The DBNF is part of an extensive group of conservation minded agencies and organizations with the common goal of restoring this imperiled ecosystem.

The Rockcastle Conservation Initiative is a consortium of stakeholders from state and federal agencies, along with special interest groups, working together toward the common goal of protecting and enhancing natural resources in the Rockcastle River Basin. Part of their work seeks to improve aquatic and terrestrial habitat in the Rockcastle River corridor in order to support endangered mussel populations downstream. Other wildlife-related efforts on national forest lands are habitat improvement projects in partnership with the National Wild Turkey Federation (NWTf) and Rocky Mountain Elk Foundation.

In Kentucky, shared stewardship is also practiced as an effective approach to wildland fire management under various agreements with the Kentucky Division of Forestry, The Nature Conservancy, Job Corps, and University of Kentucky.

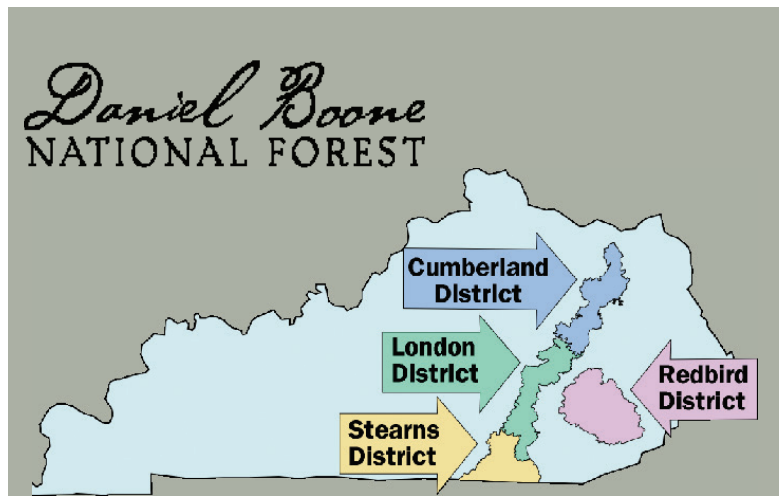
Opportunities for the future

Shared stewardship provides opportunities to protect more communities and watersheds, to produce more timber volume, and to treat more acres for hazardous fuels. With an increase in collaboration, we can reduce fire risks and improve forest conditions.



Elk bulls fighting on the DBNF.

Wild turkeys foraging on the DBNF.



More about the forest:

The Daniel Boone National Forest is among 154 national forests and 20 grasslands managed by the Forest Service under the U.S. Department of Agriculture. The agency’s mission is to sustain the health, diversity, and productivity of the nation’s forests and grasslands to meet the needs of present and future generations. Visit the DBNF website at <https://www.fs.usda.gov/dbnf/>



Photos courtesy:
Laura DeWald

White Oak Tree Improvement – what is it and why are we doing it?

by Laura DeWald

Tree improvement is the selection of trees to create offspring with desired characteristics (disease or insect resistance, fast growth rates, high quality wood, etc.). The goal is to produce high quality seedlings that will be successful competitors and become adult trees, thus providing important ecological and wildlife values to the forest, and economic values for trees being harvested.

Currently, white oak seedlings are not competing successfully in the forest. Forest management techniques are being used to address this problem, but we can facilitate these efforts through tree improvement. Thus, a white oak improvement program was initiated at the University of Kentucky in collaboration with the US Forest Service and Kentucky Division of Forestry (KDF).

What are the steps in a white oak tree improvement program?

Step 1: Collect acorns from trees with desired characteristics and plant in a nursery. Because white oak occurs across the entire eastern US, it will take many volunteers and 3 to 5 years to accomplish this step.

Step 2: Identify best seedlings from each acorn collection and transplant them into progeny tests to evaluate the parent trees. “Best” = good competitors in the forest, and thus selected seedlings have larger diameters and are tall and straight with few side branches. Once growing in progeny tests, trees are evaluated for a wide variety of ecologically and economically valuable traits. This can happen for white oak within 7 to 15 years. Progeny tests are located across the US to help us understand how far white oak seed can be safely moved, how white oak will respond to changing climates, and to identify superior locally adapted versus superior seed sources that perform well across a wide geographic range.

During Step 2, twigs (called scions) from parent trees the acorns were collected from are grafted onto seedling root stock to create a clone bank to store the parent tree genetics.

Step 3: Grafted white oak seed orchards are created using scions from the clone bank using a mixture of parents

that produced superior offspring in progeny tests. Mating among these superior grafted parents will produce genetically diverse, superior performing seedlings. Grafted seed orchards using different sets of superior parents are established across the eastern US to ensure the best seed sources for different regions. Grafted white oak can start producing acorns in 7 years (versus 20+ years in the forest).

Step 4: Acorns from seed orchards are grown in nurseries and produce superior seedlings that are available to landowners for transplanting into woodlands.

How can you participate in the white oak tree improvement program?

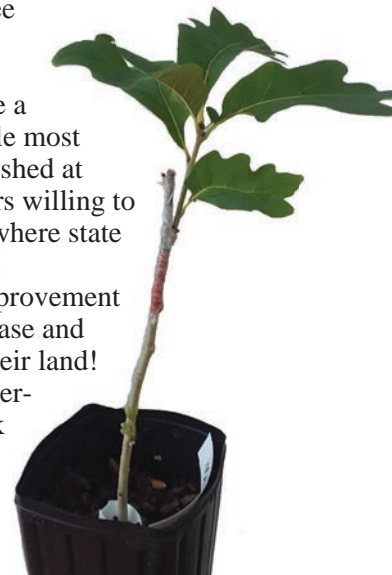
We need help collecting acorns and scions from high-quality trees, and to spread the word about this effort.

We need help finding volunteer tree climbers to collect scion material.

We need landowners across the eastern US who are willing to have a progeny test on their land and while most seed orchards will likely be established at state nurseries, we need landowners willing to have a seed orchard on their land where state lands are not available.

Deployment – white oak tree improvement will fail if landowners don’t purchase and plant the superior white oaks on their land!

If you, or you know someone interested in helping with the white oak tree improvement effort, please contact Laura.DeWald@uky.edu to discuss the details of what is involved, time commitment, resources, etc.



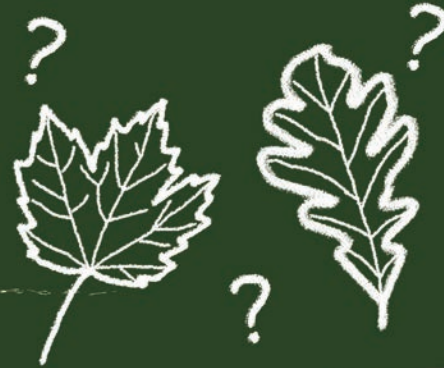
The White Oak Genetics Project is working to identify and plant superior white oak trees.

About the Author:

Laura DeWald, Ph.D., UK Department of Forestry and Natural Resources is the Tree Improvement Specialist coordinating the White Oak Genetics Project (<https://white-oak-genetics.ca.uky.edu/>).

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FORESTRY 101



Tree Identification

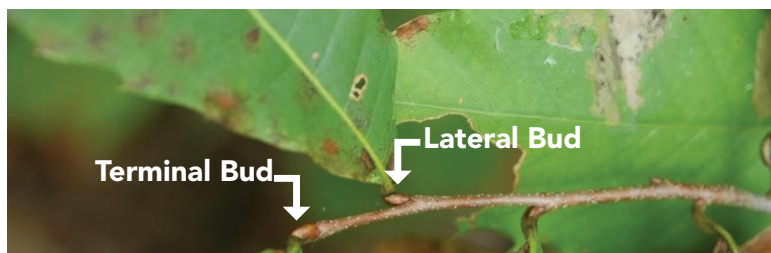
by Laurie Taylor Thomas

Kentucky's trees are beautiful, beneficial, valuable and very numerous. Kentucky has more than 12 million acres of very diverse forests with more than 120 different tree species. Kentucky owes a great deal of its tree diversity to our geographical location and our wide variety of habitats from the mountains of Eastern Kentucky to the bottomlands of Western Kentucky. Learning to identify our trees can be challenging but very rewarding. In this article we will discuss tree characteristics and how to use a dichotomous tree leaf key. Learning to identify your trees will allow you to enjoy your woodlands even more. Please be warned...once you start to learn your trees it is difficult to look at any tree and not want to try and figure out what species it is.

Trees, like all organisms, have identifying characteristics. The main characteristics we use to aid in tree identification are the leaves, buds, flowers, fruit and bark. In winter, the buds are the main characteristic used for identification unless the tree is a conifer with needle-like leaves. During the growing season the leaves are the primary and easiest characteristic to use for identification. However, the buds are still an important characteristic for identification even during the growing season. The two best characteristics and the ones most dichotomous keys use are based on tree leaves and buds.



Beautiful fall color in Kentucky. Photo courtesy: Tom Barnes



Karan A. Rawling, UGA, Bugwood.org

A bud is a small lateral (along the stem) or terminal (tip of the stem) bulge on vascular plants that may develop into a leaf, flower or shoot during the next growing season. Buds are helpful for identification during all seasons except spring when those buds are beginning to expand into new growth.

A dichotomous leaf key is a great tool to use for identifying trees. Dichotomous keys are also used for flowers, animals, rocks, fish, and more!

A dichotomous key contains a series of choices that lead the user to the correct name of an item or organism. "Dichotomous" means "divided into two parts." Therefore, a dichotomous key will give two choices in each step and lead you to the name of the organism you are trying to identify.

Most dichotomous tree keys begin with looking at the leaves. The leaves come in a variety of shapes, sizes, arrangements and forms. The first characteristic in a dichotomous leaf key is the type of leaves the tree has, conifer (needle-like, ex. pine) or deciduous (broadleaf, ex. oak). In this article we will focus on identifying our broadleaf trees. Kentucky has eight native conifers or trees with needle-like leaves. If you are interested in identifying our trees with needle-like leaves, refer to *Kentucky Woodlands, Forestry 101 "Conifers in Kentucky" Volume 3, Issue 3*.

Leaf Arrangement

The next broadleaf characteristic you will encounter in a dichotomous key is the leaf arrangement or how those leaves are arranged on the twig. Depending on the broadleaf species, leaves will be arranged in one of three ways: opposite, alternate or whorled. Oppositely arranged leaves are paired on the twig, across the stem from each other. In Kentucky, we have four groups or families of native trees with oppositely arranged leaves: maples, ashes, dogwoods and buckeyes so if you can remember the mnemonic MADBUck you can remember our oppositely arranged

Type



BROADLEAF



SCALE-LIKE



NEEDLE-LIKE

Arrangement



OPPOSITE



ALTERNATE



WHORLED

Form



SIMPLE



PALMATELY COMPOUND



PINNATELY COMPOUND



BIPINNATELY COMPOUND

tree groups. Alternately arranged leaves, which comprise most of our groups of trees, are leaves that alternate from side to side along the stem. Whorled arranged leaves will be three or more leaves that are arranged around the twig at the same location—they are whorled around the twig.

Leaf Form

Leaf form or leaf composition is the next characteristic you will encounter in a dichotomous leaf key. Leaf form can be simple or compound. The lateral bud is critical in helping determine leaf form. A leaf with a single blade attached to the petiole with the bud at the base of the petiole is a simple leaf. An example of a simple leaf is an oak leaf. A leaf with several blades attached to the stalk or rachis is a compound leaf and the blades are called leaflets; they will not have a bud at the base of the blade. Locating the lateral bud will indicate if a leaf is simple or compound. There are several types of compound leaf forms, depending on the arrangement of the leaflets. Leaflets that radiate from one end or point of the rachis in a star or palm shape is a palmately compound leaf such as a buckeye. When the leaflets are laterally arranged on each side of the rachis the leaf is pinnately compound; black walnut has pinnately compound leaves. Bipinnately or double compound leaves are when pinnately compound leaves are again compounded. Kentucky coffeetree is a species that has this characteristic. Remember, leaflets do not have buds at the base of their stalk so look for the lateral bud.

Leaf Margin

The next characteristic you will observe is the leaf edge or margin. A leaf with smooth margins and no teeth (serrations) or lobes has an entire leaf margin; dogwood is an example of a leaf with entire margins. A leaf's margin can have teeth or serrations and the types of serrations can vary depending on species. Some serrations are small with sharp tips like a steak knife (hackberry), some are larger with sharp tips like a bread knife (American beech), and some serrations have rounded tips (mulberry). A leaf that is divided into lobes separated by sinuses that are rounded or have v-shaped indentations are said to have lobed margins; silver maple and red oak are examples of lobed leaves. A leaf can be lobed and serrated (red maple) depending on species. There are several other technical terms that are applied to leaf margins, but these are the basic margins you will encounter in an average dichotomous leaf key.

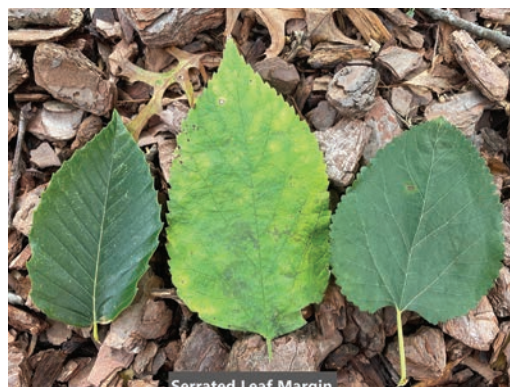
There are other characteristics you will encounter in a dichotomous leaf key and they are usually explained or are descriptive words most people are familiar with such as describing the surface of the leaf as shiny or the underside of the leaf as fuzzy or hairy. The main characteristics for you to become familiar and comfortable with as you learn to identify trees by their leaves are 1) leaf arrangement, 2) leaf form and 3) leaf margin.



Photos courtesy: Laurie Thomas



Entire Leaf Margin



Serrated Leaf Margin



Lobed Leaf Margins

The Dichotomous Leaf Key

Now that you have learned how to identify a few of the major leaf characteristics and practiced an abbreviated dichotomous leaf key the next step is find a dichotomous key that you can take into the field with you that you are comfortable using. Go out and practice using your dichotomous leaf key and get to know the trees in your woodland.

Happy Identifying!

A few useful resources to take out into your woodland for tree identification:

“Tree Finder: A Manual for the Identification of Trees by Their Leaves” May Theilgaard Watts. An inexpensive dichotomous leaf key pocket guide to identifying native trees of U.S. and Canada east of the Rocky Mountains. Includes 161 species with illustrated with line drawings. The small (6- by 4-inch) format fits in pocket or pack to take along on a hike.

“What Tree Is That” By the Arbor Day Foundation. A 164-page guide-book, with step-by-step approach dichotomous key approach for 250 common trees in North America with a water-resistant cover. <https://shop.arborday.org/what-tree-is-that>

Virginia Tech Tree Identification App. A free App for your phone from Virginia Tech digital dendrology. It contains fact sheets for over 1000 woody plants from all over North America with an in-depth description, range map and thousands of color images of leaves, flowers, fruit, twigs, bark and form.

About the Author:

Laurie Taylor Thomas, is an extension forester at the UK Department of Forestry and Natural Resources and is responsible for providing forestry and natural resource education programs for youth and adults across the state.

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Advertisements



Test time!

(answers at end of article)

- 1) Broadleaf or conifer?
- 2) Leaves / alternately or oppositely arranged?
- 3) Is the leaf form simple or compound?
(Remember to look for the bud.)
- 4) Is the leaf margin entire or lobed?
- 5) Is the leaf margin entire or serrated?



Answers: 1) conifer, 2) opposite, 3) compound, 4) lobed, & 5) serrated

Abbreviated Example of a Dichotomous Leaf Key

- A. Does the tree have needle or scale like leaves? Go to F
- A. Does the tree have broad leaves? Go to B ✓
- B. Are the leaves arranged oppositely on the twig? Go to G
- B. Are the leaves arranged alternately on the twig? Go to C ✓
- C. Are leaves simple in form? Go to D ✓
- C. Are the leaves compound in form? Go to H
- D. Are the leaf margins entire and smooth? Go to E ✓
- D. Are the leaf margins serrated? Go to I
- E. Is the leaf heart-shaped? **Eastern redbud**
- E. Is the leaf oblong in shape with a hair-like, bristle tip? Shingle oak
- F. Probably a conifer
- G. Probably a maple, ash, dogwood or buckeye
- H. Probably a walnut or hickory
- I. Probably a hackberry





Learning New Routines

by Doug McLaren, KWOA President

www.kwoa.net



Since the beginning of March we have had to better understand the meaning of connections. Connections of family, friends, our professional colleagues, and medical experts. We have also needed to learn new meanings of some all too familiar words. Words such as Zooming, social distancing, shelter-in-place, PPE (personal protection equipment), asymptomatic, and essential workers.

It reminds me of another time in our recent history where we all had high anxieties having to learn new meanings and skills. The dawning of the personal computer age. We were introduced to new word usage. Words like bits and bytes, modems, rebooting our computer, the possibility of a memory overload to our computer's hard drive and floppy drives. We even had to accept that a mouse held in our hand made computer commands possible. Both of these periods of time, the present pandemic and that of the personal computer, have radically changed our daily lives. We have had to learn a "new normal." The events beginning in March of this year have created connections in life that are still changing.

As woodland owners, not only in Kentucky but worldwide, we recognize and enjoy the sense of being outdoors. As the new year 2020, woodland owners undoubtedly began the annual lists of "need to do" projects to improve our individual woodlands for the immediate tomorrows as well the distant ones. I made the same list early this year as I sat in front of my woodstove in my home recognizing all too well where the wood comes from and appreciating more the warmth that it provides.

As the crisis began to grow this spring so did my desire to forget the "need to do" list and began to appreciate more the value of my woodlands as they stand today. I began to appreciate my outdoor spaces more. I realized also that not everyone has that experience of seeing a woodland wake up from a deep winters sleep and begin its ritual of restoring new life in the form of flora and fauna that each woodland acre provides. I quickly realized my woodlands connect my family, friends, and worldwide neighbors in each of the products the woodlands produce. Without doing anything to our renewable sustainable managed woodlands, we are providing homes for wildlife and clean water that enters much larger watersheds to be used by others. Without doing anything to these woodlands fresh air is being produced for the health of others.

As spring finally emerged, people that had been quarantined for weeks realized also the social need and value of woodlands—even if it was only a park setting—the need to be outside. To be out and to connect with those outdoor experiences that had been harbored all winter.

I am an absentee woodland owner but this year, knowing the epidemic was not going to be over quickly, I began to revisit my property more often. The visits were made not to check items off items of the "need to do" list, but to simply enjoy, reflect, and be inspired by being out and walking those trails that provide each of us a sense of appreciation.

As you read these words, I do hope all is well with your family and friends and you too have made some connections with woodlands.

Photo courtesy: Renee' Williams

For more information log on to www.kwoa.net



Kentucky Tree Farm Committee Newsletter

The Kentucky Tree Farm Committee is responsible for administering the Tree Farm program in Kentucky. One of the most difficult but enjoyable responsibilities of the committee is selecting the annual Tree Farmer and Logger of the year award winners. Read on to learn about the most recent Kentucky Tree Farm Committee award winners.

American Tree Farm System Sustainability Standards Review Process

One of the unique aspects of the American Tree Farm System (ATFS) program is that it is internationally endorsed by the Programme for the Endorsement of Forest Certification (PEFC). PEFC requires that endorsed certification systems like ATFS undergo a review at least every five years to ensure conformance with its international requirements. This process provides an opportunity to engage with ATFS community of landowners, partners, and stakeholders concerning certification and its delivery to family forest owners. The process looks at

Woodland owners were invited to submit comments during the review period (June 2 - August 2, 2020) for the proposed new 2020-2025 Standards.

For more information about the standards revision process and public comments on the standards, please follow these links: <https://www.treefarmssystem.org/standards-process-overview> and <https://www.forestfoundation.org/atfs-public-comment-standards-2020> or contact Leigh Peters at lpeters@forestfoundation.org



Photo courtesy: Loyd Family

Tree Farmer of the Year Oliver Loyd, Loyd Family Woodland Reserve Tree Farm.

First insert left from left to right: Herb Loyd, Toby Loyd, Lina Loyd, Jonas Loyd, Renata Kenney. Second insert: First row left to right: Josh Frazier, Haley Frazier, Neely Ann Frazier, Zoe Keck, Zeke Keck, Joe Bill Frazier. Second row left to right: James Keck, Katelyn Loyd, Tara Loyd, Murti Nauth, Parke Loyd. Third insert left to right: Katelyn Loyd, Brooke Loyd, Ty Collins

the latest forest scientific developments, including technologies and new landowner engagement principles.

American Tree Farm Program is in the process of revising the 2015-2020 Standards of Sustainability for Forest Certification (Standards). The new standards are to be put in place in 2021. The revision process is led by an Independent Standards Review Panel (ISRP) appointed by the American Forest Foundation Board, which oversees the Tree Farm System. The ISRP is comprised of a representative cross-section of forestry community leaders and stakeholders in the ATFS Program who have interest in the sustainability of small forest ownerships in the US.

The Standards are intended specifically for the size, scale and intensity of small forest ownerships, and the capacities and resources of those ownerships. The Standards are the benchmark for all ATFS forest certification and are third party audited. The program launched a 60-day public comment period on the current Standards. Feedback is valued by tree farmers and the public alike.



Kentucky Tree Farmer and Logger of the Year

The 2019 Tree Farmer and Logger of the Year were selected by the Kentucky Tree Farm Committee. Congratulations to Tree Farmer of the Year Oliver Loyd, Loyd Family Woodland Reserve Tree Farm in Wallingford, KY, and Logger of the Year Brandon Brock, Mayking, KY. They were honored at the Kentucky Forest Industries Association Annual Meeting, rescheduled from April to August 25 - 27 at the Brown Hotel in Louisville, KY.

Logger of the Year Brandon Brock. Photo courtesy: Stewart West





Kentucky Natural Resources Conservation Service

Programs Help Private Forest Landowners to Increase Early Successional Habitat, Decrease Degraded Forest Stands

by Jared Calvert, Shared Forest Silviculturist, USDA's Natural Resources Conservation Service & U.S. Forest Service

Kentucky is slowly losing early successional habitats to forest succession and lack of proper forest management. The wildlife species that depend on these open habitats are being lost as well. USDA's Natural Resources Conservation Service (NRCS) is committed to improving successional habitat and improving forest stands by partnering with other agencies and private forest landowners across Kentucky.

What is Successional Habitat?

Vigorously growing grasses, forbs, shrubs and trees provide excellent food and cover for wildlife but need disturbances to be maintained. If these habitats are not mowed, brush hogged, burned, cut, grazed or disturbed, they will eventually become mature forest over time. Grasslands, old fields, and young forests are often referred to as early successional habitats, which provide some of the most species-rich habitats.



Photo courtesy: Jared Calvert

Early successional habitat in Pulaski County, Kentucky, created through a combination of timber harvesting and prescribed fire.

Species that Benefit

Grassland birds generally need large fields combined with delayed mowing that allows successful nesting. Shrubland birds need low, thick woody cover for nesting, and snakes forage in these productive early successional areas for insects, frogs, and small mammals. Besides declining species, there are a variety of other wildlife that will seek out these areas for the excellent cover and quality of food they provide. Songbirds, turkey, grouse, deer, rabbit, bear, fox, na-

tive bees and many more species are drawn to old fields, thickets, and young forest where there is an abundance of flowering plants, browse, insects and soft mast (fruit). Important soft mast includes species such as raspberry, blackberry, cherry, apple, etc.

Degraded Forest Stands

In addition to the lack of early habitat in Kentucky there is also an unprecedented amount of poor timber harvesting techniques being conducted that lead to degraded stands.

Most landowners do not consult with professional foresters before logging, and in many areas few markets exist for small-diameter trees. Thus, most commercial timber harvests remove only the best quality, saw-timber size trees, but leave lower quality and smaller diameter trees. Many foresters refer to this practice as "cutting the best and leaving the rest". Such high grading reduces the quality and quantity of desirable vegetation and leads to degraded forest stands. This practice leads to the development of forest stands that consist of poorly formed trees that are often more susceptible to insects and disease. In addition, high grading reduces the ability of cut over stands to provide early successional habitat and can hamper the development of desirable species.

Also, improperly designed skid trails may contribute excess sediment to streams, hampering water quality. Both situations degrade forest stands. Unfortunately, these poor timber harvesting techniques often come at the cost of future timber production, future habitat for wildlife, and water quality.

Young Forest Initiative

Targets forest landowners who may have purchased property consisting of degraded forest stands, or who may be considering a commercial timber harvest. The project will provide technical expertise and planning that will result in an increase in both the quantity and quality of both wildlife habitat and timber products through sound forest management techniques.

Through proper forest management techniques, cut forest stands develop thick, young forest vegetation structure for several years after cutting. Such structure constitutes a type of habitat generally in low supply on most private forestlands but is very important for disturbance-depen-

dent wildlife species suffering population declines. Standing snags and downed logs left over from logging activities, or that are created through proper forest management techniques, can provide for grouse drumming logs and desirable roost trees and snags for endangered species such as the Indiana bat.

Through this project, NRCS Kentucky estimates it will provide \$1,191,000 in financial assistance to woodland owners over the next four years. Project partners will also offer in-kind support annually.

Southeast Early Successional Habitat Initiative

In addition to the Young Forest Initiative through the Environmental Quality Incentives Program (EQIP), NRCS has funded more than \$2.5 million in a Southeast Kentucky Early Successional Habitat (SEKESH) Initiative since 2013.

SEKESH is a flexible program. Through this program cost share assistance is available for novel techniques that create early successional habitat, such as the establishment of group openings through timber harvesting, edge feathering of group openings, treating invasive species, and prescribed burning.

Obtaining Assistance

Landowners in Kentucky have multiple ways to receive technical and financial assistance for forest management through NRCS to address the lack of early successional forest and to treat degraded forest stands. NRCS has many programs available that can provide the expertise of a professional forester and potential funding assistance for proper forest management.

Through EQIP, NRCS can provide private landowners with financial resources and one-on-one help to plan and implement conservation practices. Some of these practices include forest stand improvement and site-preparation for the development of desirable species within degraded forest stands. These practices involve the removal of trees through tree cutting to facilitate the development of higher quality forested habitat.

Private landowners who chose to voluntarily implement conservation practices can work with NRCS who may co-invest in these practices with technical and financial assistance to the landowner. Last year, Kentucky NRCS obligated 179 contracts that included forest management activities for nearly \$2 million with EQIP funding.

Photo courtesy: Jared Calvert



A landowner applies herbicide to remove unacceptable growing stock trees that are reducing the availability of early successional habitat and regeneration of desirable species within a degraded forest stand.

In addition, the Conservation Stewardship Program (CSP) helps landowners build on existing conservation efforts while strengthening the forest. NRCS can custom design a CSP plan to help meet forest conservation goals. On non-industrial private forestland, 69 contracts worth over \$1 million in assistance were obligated with conservation practices planned on over 6,500 acres.

Through these programs, over 26,000 acres of woodlands will benefit from planned conservation with another 16,000 acres of planned conservation practices through 2021.

In an ideal framework, the forest landowner should first contact their local NRCS office. A management plan may be obtained through the Kentucky Division of Forestry, Kentucky Department of Fish and Wildlife, or Technical Service Provider. In addition, NRCS works with partnering agencies such as the U.S. Forest Service and National Wild Turkey Federation to employ shared foresters who can assist with developing a plan for your woodland. A shared forester may work with a Kentucky Department of Fish and Wildlife Resource biologist. The biologist and forester will jointly assess the conditions of your woodland and work with you to design a management plan to treat degraded stands and create early seral habitat. Then NRCS funding could be applied for to help defray a portion of the implementation costs.

For more information on any of the programs or information listed above, contact your local NRCS office. USDA is an equal opportunity provider, employer, and lender.



Woodland owners can receive technical and financial assistance to implement conservation practices on their property through the Environmental Quality Incentives Program (EQIP).

Photo courtesy: Jared Calvert

Long-term Effects of Crop-tree Release on the Growth and Quality of Upland White Oak Stands

by Philip Vogel

White oak is a highly valued tree in Kentucky and is an important species used in construction, flooring, cabinetry, and furniture. However, its use in staves for bourbon barrels has recently driven up the value of white oak. In fact, white oak is the second most valuable hardwood in Kentucky behind black walnut. While its value and use are on the increase, there is evidence that there will be a long-term decrease in white oak throughout the region.

Beginning in the 1950s, foresters across the eastern U.S. have noticed a widespread shift in forest composition that includes a reduction in oak in our forests. The culprit is generally understood to be a loss of fire and other natural disturbances, such as grazing, that resulted in forests that were open and contained less competing tree species. The combination of more light in the forest and fewer competitors helped oak to regenerate easily. With the advent of wildfire suppression and an overall decrease in disturbance, forests became denser and competing species like maple and beech increased, both resulting in less successful oak regeneration that will ultimately reduce the amount of oak in our woods. This article summarizes on-going research at the University of Kentucky that focuses on a silvicultural technique to improve the growth and value of existing white oak sawtimber that will help keep white oak forests healthy and provide improved revenues for woodland owners.

Crop-tree release (CTR) is a silvicultural treatment in which crop-trees are identified in a stand and released from competition by removing adjacent trees. A crop-tree is any tree chosen for a particular management objective (e.g. timber production, preservation of a species, seed production, etc.). Crop-trees are released by removing trees that touch the canopy of the crop-tree, which provides the crop-tree with more room to expand its crown, which typically increases tree growth and vigor as it gains better access to sunlight. While many studies have looked at the effects of CTR on red oaks, few have focused specifically on white oak.

In 1983, three CTR treatments were applied at UK's Robinson Forest to 12 two-acre small sawtimber sized stands ranging in age

from 70 to 80 years old. The first CTR treatment released 20 crop-trees per acre, the second treatment released 34 crop-trees per acre, and a third treatment (a control) where crop-trees were identified but not released. Each crop-tree received a full release from all crown-touching stems. Crop-trees identified for this study needed to meet five criteria:

1. Dominant or codominant crown class
2. White oak species
3. Potential tree grade 1 or 2
4. Even spacing with other crop-trees in the stand
5. All things equal, trees with larger dbh

A half-acre permanent plot was installed in each two-acre stand. Over the past 35 years, these permanent plots were measured 5 times. Measurements included species, crown class, tree grade, and diameter at breast height (dbh) for every tree 1" dbh and larger. In 2019, each crop-tree was assigned a product type, which refers to the specialty product for which a crop-tree could be used because of its exceptional quality. Based on criteria from mills around Kentucky, we identified crop-trees that could be sold as a veneer log, a high-end stave log, or a low-end stave log. For this study, we asked two questions: 1) how does CTR influence the growth and quality of small sawtimber-sized white oak crop-trees? and 2) how does CTR alter the stand structure of 70- to 80-year-old upland oak stands?

We found that CTR positively influenced small sawtimber-sized white oak crop-trees. Regardless of the number of crop-trees per acre released (20 or 34), released crop-trees grew faster than unreleased crop-trees, where periodic annual diameter increment (dbh) was found to be 0.19 inches in the 20 CTR treatments and only 0.14 inches in the



Oaks, including white oaks, are still able to establish groups of seedlings but fewer and fewer of these seedlings are able to survive and become established as dominant canopy trees.

Photo courtesy: Jeff Stringer

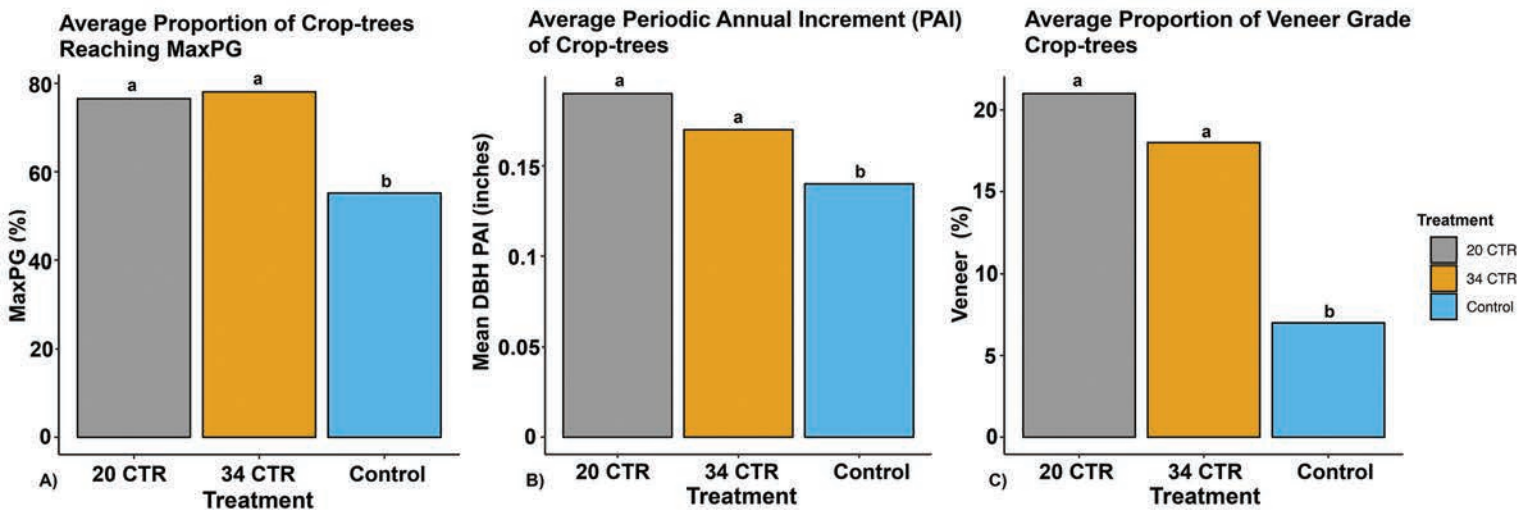


Figure 1. A) Average proportion expressed as a percentage (%) of crop-trees reaching their maximum potential grade (MaxPG) by treatment. B) The average PAI DBH (inches) of crop-trees by treatment. C) Average proportion expressed as a percentage (%) veneer grade crop-trees across each of the three treatments. Letter adjacent to each bar chart indicate a significant difference ($\alpha = 0.05$). Here we see a significant difference in each subfigure between treated CTR and the untreated controls.

control (Figure 1). Additionally, released crop-trees were more likely to achieve their maximum potential quality than unreleased trees. Almost 80 percent of the released crop-trees achieved their maximum value while only 55 percent of the unreleased controls did so over 35 years. Twenty-one percent of the crop-trees contained a high-quality veneer log while only 7 percent of the unreleased trees did (Figure 1).

While CTR certainly enhances the growth and quality of crop-trees, it also affects stand structure, providing a light thinning over the entire stand. Before the trees were released all of the stands had very high tree densities, considered to be “overstocked” in silvicultural terms. CTR reduced stocking to an average of about 76%. During the next 35 years, the released stands increased their density and were again overstocked and very similar to the controls, indicating that CTR promotes stand-wide growth. Fortunately, this level of canopy disturbance does not appear to promote maple or beech growth in the understory as the ingrowth accounted for by maple and beech was similar across treatments.

As oak-dominated forests change over time, landowners need tools that create suitable conditions for oak growth and persistence. This study has shown that crop-tree release applied to small sawtimber-sized upland white oak stands increases crop-tree diameter growth as well as the likelihood that a crop-tree will reach its maximum potential grade. Crop-tree release also showed that it can increase the percentage of trees that can be sold as veneer, the highest valued product from oak. It also stimulates stand-wide growth without harming or altering stand growth and yield. In combination with other treatments that focus on understory conditions, it could promote oak repro-



Photo courtesy: Philip Jay Vogel

Figure 2. Photo taken at University of Kentucky’s Robinson Forest highlighting marked and treated crop-tree as part of this CTR study.

duction as well by creating favorable light conditions at the forest floor. Perhaps most importantly for landowners in Kentucky, CTR is scalable across a variety of sizes of forestland holdings, allowing many landowners to promote the growth and quality of their high-value white oaks.

About the Author:

Philip Jay Vogel, has an M.S. in Forestry from the University of Kentucky. He works for the Lexington-Fayette Urban County Government in the Division of Environmental Services.

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KDF Corner...

Forestry Planning Then and Now

by Pam Snyder

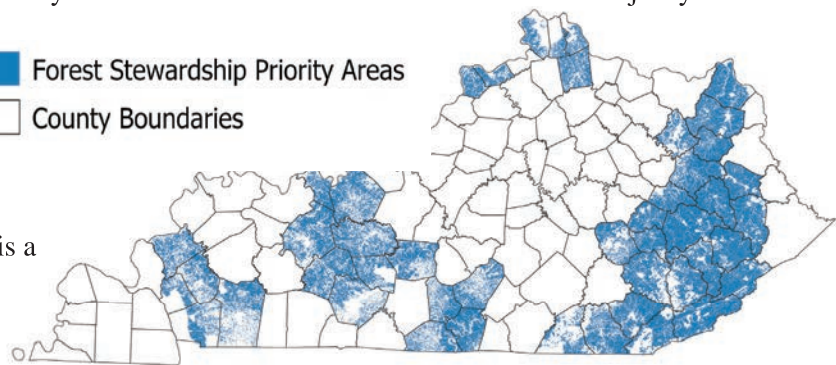
Planning for the next 10 years...

The 2008 Farm Bill required each state to complete a Statewide Forest Resource Assessment and Strategy (SFRAS) document. The SFRAS has evolved into the Kentucky Forest Action Plan (FAP). In 2010, the division released the first edition of the FAP. It examined historical, current and future forest trends covering five major issues (water quality and quantity, forest health, forest loss and fragmentation, forest management and funding). Input was received from nonprofits, partners, federal and state level agencies and the public. Assessments, goals, objectives and strategies were developed within the FAP. It has served as a strategic plan for Kentucky's forestlands and guides the division in planning for long-term sustainability of Kentucky's forest resources.

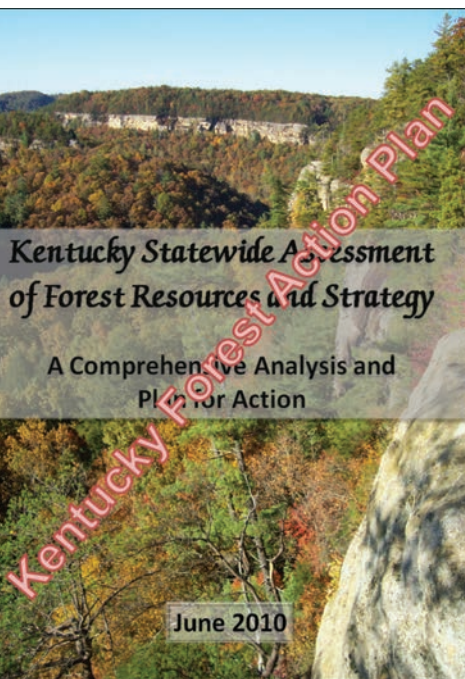
In 2015, the state forester reviewed the Kentucky FAP ensuring its strategies addressed the National Priorities and Themes. The 2018 Farm Bill requires each to update their FAP on a ten-year cycle. To meet that requirement, a very dedicated group of division employees has been working for almost a year now to review and revise the FAP. Input was sought to ensure the issues were still important to partners and citizens. New initiatives and opportunities since 2010 have been included in the strategies to address the issues.

The biggest change people are likely to see is a more focused effort in identifying priority areas. The division reduced the footprint of designated state-level priority areas. Forest stewardship priority areas were established in and out of the state-level priority areas. The new forest stewardship priority areas will focus on technical assistance and accomplishing tasks more efficiently for the division concerning the forest stewardship program. Urban priority areas have also been identified. Because the majority of Kentucky's citizens reside in urban areas, providing for sustainability of urban forest resources is a daily challenge.

 Forest Stewardship Priority Areas
County Boundaries



The areas highlighted in blue represent the new Forest Stewardship Priority Areas. However the Kentucky Division of Forestry will continue to serve all areas of the Commonwealth forestry community.



The 2010 Kentucky Statewide Forest Resource Assessment and Strategy is being revised for 2020 and will serve as a guiding document for the Kentucky forestry community.

Focusing the priority areas does not mean the division will not provide its services statewide. Priority areas are areas where the most benefit can be achieved in addressing the issues. The division will still provide its services to all landowners, communities and partners requesting them.

The division is working on compiling all the information into a final product. The 2020 Kentucky FAP will be a guiding document for addressing the 12 million acres of forests in Kentucky.

About the Author:

Pam Snyder, is the Forest Management Chief with the Kentucky Division of Forestry and works on a variety of forest management needs for private landowners, farmers, and governmental agencies. She is one of the editors of the Kentucky Woodlands Magazine.

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2020 Kentucky Maple Syrup School Scheduled for November 7, 2020



The Kentucky Maple Syrup Association (KMSA) and the University of Kentucky Cooperative Extension Service will be hosting the 2020 Kentucky Maple Syrup School online. Topics and featured speakers include Glen Goodrich with Goodrich Maple Farm in Cabot, Vermont, which over the last 25 years has grown into a leading syrup producer in the United States from starting out by tapping only 25 trees. In

addition to Mr. Goodrich, the school will feature Ben McKinney, a fifth-generation maple producer in Maine, who has expanded from maple syrup production to a whole line of value-added maple products. Kate Fotos with the Future Generations University in Franklin, West Virginia will be discussing the production of walnut syrup. The 2020 Kentucky Maple School will provide new and established producers an opportunity to connect with a statewide Kentucky Maple Syrup Research Program that is working to help maple syrup producers. To register and learn more about the 2020 Kentucky Maple Syrup School or maple syrup research please visit <https://ky-maplesyrup.ca.uky.edu/>.

Woodland Stewards Webinar Series to Continue in February 2021

UK Forestry and Natural Resources Extension is teaming up with universities around the region to offer the final round of the woodland stewards webinar series. This all-new 4-part webinar series features forestry and natural resources experts from around the region to help woodland owners take actions to make their woodlands healthier and more productive. The series will take place in February 2021 and will help you develop short- and long-



term goals for your woodland and help you get you started actively managing your own woodlands. The series will also cover the latest mobile apps and online resources that can help you manage your woodland. In addition, one session will focus on safety in your woodlands. The final session in the series is being led by Dr. Jacob Muller with the UK Department of Forestry and Natural Resources Extension team. The session will walk you through how to efficiently and effectively become a woodland steward. For updates on the series visit www.ukforestry.org.

Jacob Muller Introduction

Dr. Jacob Muller joined the Department of Forestry and Natural Resources at the University of Kentucky on February 1, 2020. He is an Assistant Professor of Hardwood Silviculture and Forest Operations Extension here in the Department. His research efforts focus on long-term forest dynamics and testing the efficacy of classical and novel silvicultural approaches aimed at forest adaptation. His extension and teaching efforts include the development of continuing education programs for woodland owners and natural resource professionals. He is also engaged in the development and advancement of educational tools to better inform landowners of current and future management challenges.



Upcoming Dates To Remember:

Dates:	Event:	Location:	Contact:
November 7, 2020	<i>Kentucky Maple Syrup School</i>	Zoom meeting via the Web	https://ky-maplesyrup.ca.uky.edu
December 9, 2020	<i>Kentucky Woodland Owners Association Annual Meeting</i>	Zoom meeting via the Web	www.kwoa.net
February 6, 2021	<i>Kentucky Maple Day</i>	Various locations	https://ky-maplesyrup.ca.uky.edu
February 2021	<i>Woodland Stewards Webinar Series</i>	Zoom meeting via the Web	http://forestry.ca.uky.edu/webinars_upcoming ; 859.257.7597
March 27, 2021	<i>Ohio River Valley Woods and Wildlife Workshop</i>	Boone County Enrichment Center	www.tristatewoods.org or 859.257.7597

NEWS TO USE

Healthy Woods App

by Carol Spence and Ellen Crocker

A new mobile app makes receiving research-based woodland management information as easy as reaching for your phone. HealthyWoods, a collaborative effort between forest specialists from Kentucky and other hardwood-producing states in the Appalachian region, provides woodland owners with a convenient tool to scout the health of their woods. The HealthyWoods app prompts users to answer a series of questions related to the current conditions found in their woodlands and allows them to upload pictures from their phones. The questions deal with such things as how the canopy looks, how healthy the trees are, what the understory looks like, and whether invasive species are present. After completing the questionnaire, the user immediately receives a report geared to their management goals.

The HealthyWoods app was developed by a team of researchers including Drs. Ellen Crocker and Jeff Stringer with UK Department of Forestry and Natural Resources and Margaret Staton and Abdullah Almsaeed, from the University of Tennessee. HealthyWoods is available for free for Apple and Android devices.



Virtual Kentucky Woodland Owners Short Course

Have you wanted to attend one of the annual Kentucky Woodland Owners Short Course (WOSC) in the past but could not fit it into your schedule? Now there is a solution that allows you to virtually participate in the Kentucky WOSC. The Kentucky (WOSC) is the largest educational program designed specifically for Kentucky woodland owners. Administered and coordinated by the UK Department of Forestry and Natural Resources Extension team, the WOSC includes more than ten partner organizations who work with and support Kentucky woodland owners in caring for their woodland resources. In addition to a virtual option for Kentucky woodland owners to attend

the WOSC, UK Forestry and Natural Resources Extension is working on a dedicated website to support them. Visit www.kywosc.org to learn more about woodland management in Kentucky and to register for the Virtual Kentucky Woodland Owners Short Course.



From the Woods Today — A Weekly Online Program



In April, the UK Forestry and Natural Resources Extension team launched a weekly online program called “From the Woods Today”. This program offers relevant and timely information about woodlands, wildlife and various related topics each Wednesday at 11 a.m. EDT on the online, social conferencing platform called Zoom and on Facebook Live. Hosts Billy Thomas and Renee Williams, UK extension forester and information specialist, respectively, welcome UK specialists and partner organizations to share their vast knowledge of Kentucky’s forests and the wildlife that calls them home. The link to the Zoom sessions, a list of topics and archived episodes are available at <http://www.FromTheWoodsToday.com>. Anyone can join a session, regardless of their location. The episodes are also available on Facebook Live at <https://www.facebook.com/ForestryExtension/>. If you’re interested in a segment out of a specific episode such as Tree of the Week or Snake ID visit Forestry Extension’s YouTube channel at <https://www.youtube.com/channel/UCQcUEf2g33tiS6YP5eNVFjw>





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The Virtual WOSC provides those with an interest in woodlands and wildlife a series of educational programs focused on practices that can make Kentucky woodlands healthier and more productive.

Register at <https://wosc.ca.uky.edu/register>