



# Kentucky Woodlands

Volume 7 Issue 2  
Magazine

**Emerald Ash Borer Update**

**Woodland Roads**

**Using Midstory Removal  
to Enhance Oak Development**

# Kentucky Woodlands

Volume 7 Issue 2 Magazine

December 2012

*Promoting stewardship and sustainable management  
of Kentucky's non-industrial private forests.*

## *In this Issue...*

Emerald Ash Borer Update	1
Recommendations for Ash Management	4
From the Woods: Maurice Cook	7
Kentucky Tree Farm Committee Newsletter	12
Hemlock Woolly Adelgid Update	14
Tree Pests Threatening from North and South	19
Wood Expo	22

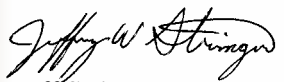
## **Departments:**


KWOA	9
FOR 101: Woodland Roads	10
Research In Brief: Using Midstory Removal to Enhance Oak Development	16
Kentucky Champion Tree Program	20
Forest Health: Butternut Canker	21
Test Your Knowledge	23
Kentucky Woodland News To Use	24

## *From the Editors of the Kentucky Woodlands Magazine:*

Woodland owners, we hope your 2013 is off to a great start or a least you did not go over your own fiscal cliff. Forestry issues are extremely dynamic as 2013 starts off. Though this may be an understatement, this issue will discuss some of the more important concerns including updates on emerald ash borer and hemlock woolly adelgid both continuing to expand in Kentucky and the Asian longhorn beetle that is one windstorm away from moving in from Ohio. Other late breaking information is found in Kentucky Woodland News to Use. See this section for updates on the U.S. Supreme Court hearing regarding logging road permitting that occurred on December 3 as well as updates on State Forest certification and the recent 2012/2013 Forestry Economic Report and Outlook.

This issue also contains articles providing direct management information for woodland owners including how to decide what to do with ash trees in your woodlands, a research brief on encouraging oak development, and how to fix mud holes in your woods roads. As usual the magazine contains information from forestry organizations, a featured champion tree, and information on forest health, in this case a review of butternut canker. We hope that 2013 settles down some, but only time will tell.

  
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## **About the Cover:**

The cover image was supplied by John Cox, Adjunct Assistant Professor of Wildlife and Conservation Biology, UK Department of Forestry. This winter storm photograph was taken in a oak savanna in Harrison County in 2009 and is a reminder of the devastating ice storm that impacted large areas of Kentucky.



Photo courtesy: Thomas Barnes

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**Editor's Note: The use of FSC mixed source paper indicates Kentucky Woodlands Magazine's commitment to sustainable woodland management. We are also pursuing the use of SFI paper produced on SFI certified and American Tree Farm System certified land.**

# *Emerald Ash Borer Update*

*by Joe Collins and Jennie Condra*

*Adult EAB sitting on an ash leaflet.*

*Photo courtesy: Doug McLaren*



*Firewood transportation is believed to be one of the leading ways that the emerald ash borer and other tree insects are moved from location to location.*

**E**merald ash borer (EAB) is an exotic beetle that was found for the first time in Kentucky in May 2009. The initial find turned out to be two separate locations: Jessamine and Shelby counties. Since that date, EAB has also been found in 19 additional counties in Kentucky.

## ***How did EAB get to the United States?***

It is believed that EAB first arrived in the United States in the early to mid-1990s in wood packing material originating from China. The wood packing material, or crating, was not heat-treated, and EAB larvae were hidden inside the wood. Once the crating was taken off the shipment, the insects emerged and flew to the native ashes that are a common plant species in that part of Michigan. The beetle population went undetected for several years until, in an area near Detroit in the summer of 2002, adult beetles were collected and determined to be an exotic beetle originating from Asia. Since that initial discovery in 2002, EAB has been discovered in 18 states and 2 provinces in Canada.

## ***How did EAB get to Kentucky?***

We will never be 100 percent positive on how EAB got to Kentucky, but we believe that some of the EAB locations in Kentucky are directly related to the movement of infested firewood. When EAB was first found in Michigan and later in Ohio, it was discovered that EAB could emerge

from infested ash firewood that had been cut the previous fall. As EAB began to be found in more and more states, it became apparent that several of these new locations were campgrounds. The correlation was made that campers were bringing infested wood to the campgrounds and the beetles were emerging and establishing in the woodlands surrounding the campground.

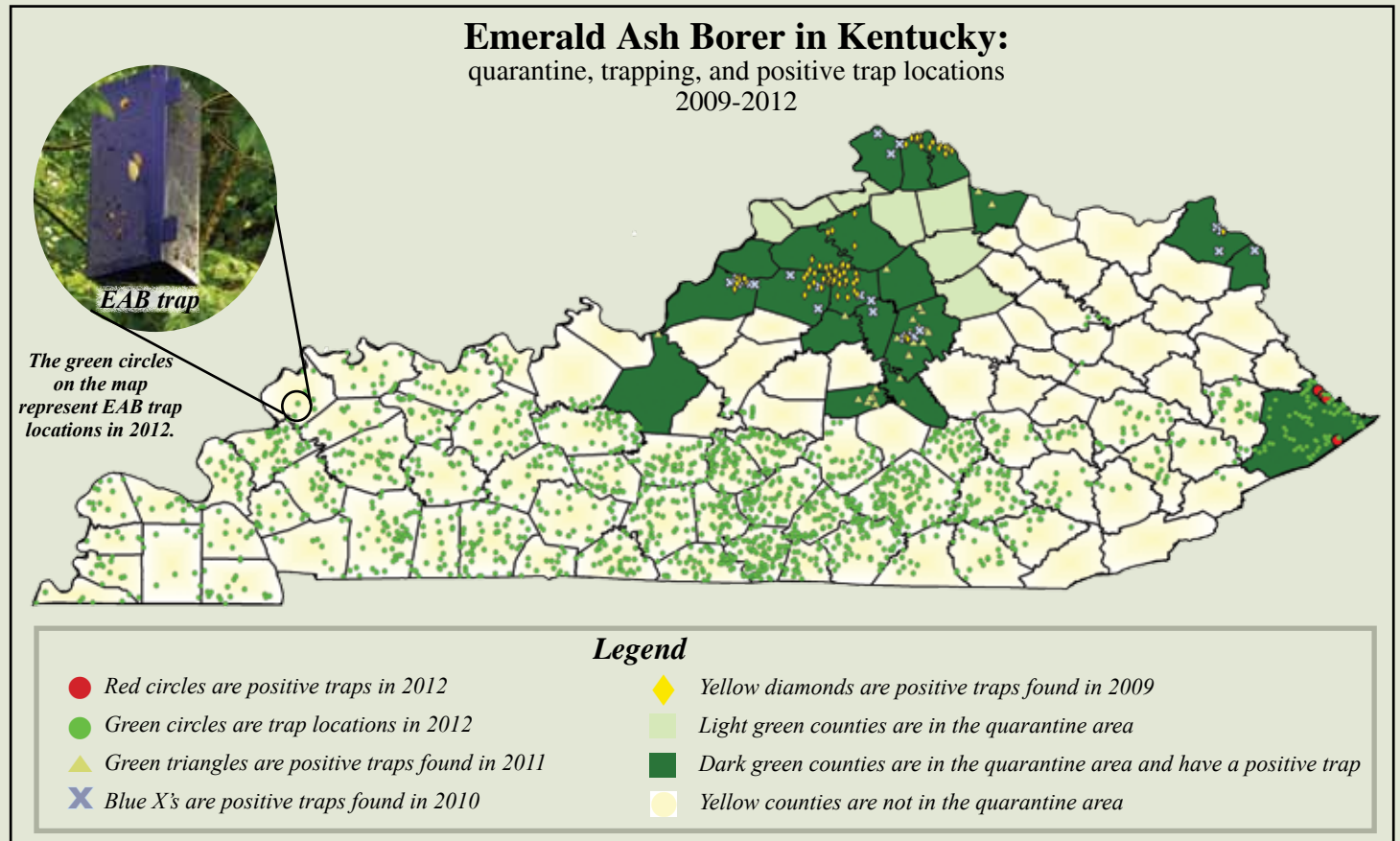
## ***Where is EAB in Kentucky?***

Currently EAB is known to be established in all or parts of these counties. The number behind the county represents the year that EAB was first detected in that county. Anderson (2011), Boone (2010), Boyd (2010), Boyle (2011), Bracken (2011), Campbell (2009), Fayette (2009), Franklin (2009), Garrard (2011), Greenup (2009), Hardin (2011), Henry (2009), Jefferson (2009), Jessamine (2009), Kenton (2009), Oldham (2009), Owen (2009), Scott (2011), Shelby (2009) and Woodford (2009). Based upon the 2012 purple trap survey, we can now add Pike County to the list of counties with EAB.

*Photos courtesy: Joe Collins*

## Where did we look for EAB this year?

As beetles are found in Kentucky, the trapping front moves further south and west. Trapping efforts for 2012 were concentrated in the southern portion of the state. The northern border for traps in Eastern Kentucky was Pike, Floyd and Breathitt counties. This line extended westward to Larue and Grayson counties, the northernmost counties in central Kentucky containing traps. The entirety of Western Kentucky contained traps.



This map shows the location of EAB traps in 2012, the counties that EAB has been found in, and the counties that are currently under the EAB quarantine. For more information about the EAB and the quarantine please visit [www.ca.uky.edu/forestryextension/EAB.php](http://www.ca.uky.edu/forestryextension/EAB.php)

### What are the hosts for EAB?

Luckily EAB only attacks ash trees. University research has shown that EAB is unable to feed on any other species of tree and survive. Unfortunately all North American species of ash are susceptible to attack from EAB. Green ash is the most preferred, followed by black, white and then blue ash. There does appear to be some resistance in some of the Asian species of ash, which is understandable because EAB and the Asian ash trees have evolved together.

### How does EAB kill an ash tree?

Beetles begin to emerge from ash trees about the same time black locust trees are in full bloom, which is usually around the first two weeks of May in Kentucky. The beetles fly to the branches and feed on the leaves of the ash tree before mating. The amount of leaf feeding done by the beetles will not be very noticeable to the casual observer. After mating, the female seeks out

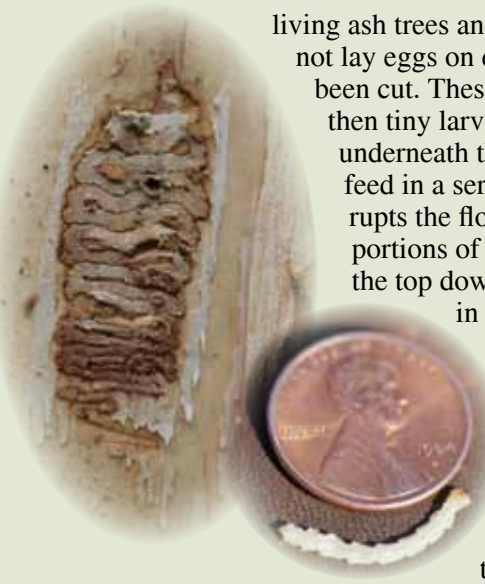


This ash tree is under heavy attack from EAB. Larvae feeding under the bark disrupts the flow of water and nutrients to the top of the tree causing dieback in the crown of the tree.



These ash trees have a thin crown and epicormic sprouting as a result of EAB.

living ash trees and lays her eggs on the bark. EAB will not lay eggs on dead trees or on wood that has already been cut. These eggs will hatch in one to two weeks, then tiny larvae (or the caterpillar stage) will burrow underneath the bark and begin feeding. The larvae feed in a serpentine pattern, and this feeding disrupts the flow of water and nutrients to the upper portions of the tree. The tree begins to die from the top down. EAB prefer to first attack an ash tree in the upper canopy then move downward in subsequent years as the tree begins to die. EAB are also known to attack ash tree roots that are exposed along the ground. The larvae feed from July through October, then they suspend feeding for the winter. In the spring the larvae finish feeding then pupate, changing from a larva into a beetle. There is only one generation of beetles per year.

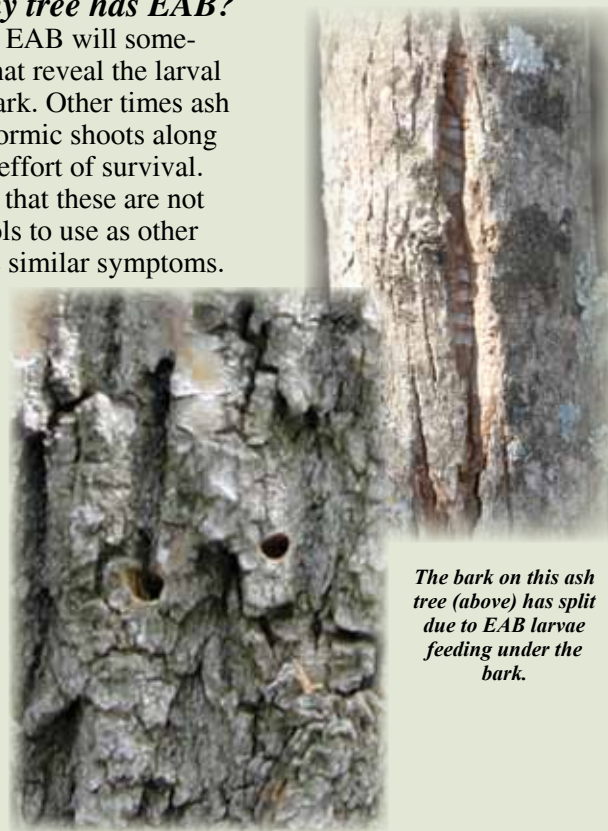


*Top: Tunneling caused by a single EAB larva. Right: EAB larvae will be creamy white with bell-shaped segments.*

### **How do I know if my tree has EAB?**

Trees being attacked by EAB will sometimes have bark splits that reveal the larval tunneling beneath the bark. Other times ash trees may send out epicormic shoots along the trunk as a last ditch effort of survival. It should be pointed out that these are not definitive diagnostic tools to use as other borers of ash may cause similar symptoms.

However, the presence of 1/8-inch D-shaped holes in the bark of ash trees is a definitive sign that the tree is being attacked by EAB. Other borers of ash will make holes that are oval or round, but only EAB makes a distinctive D-shaped hole. Unfortunately EAB begins to infest a tree from the top down, so by the time the holes are visible at eye level, the tree has been under attack for several years and may be near death.



*Characteristic 1/8-inch D-shaped EAB exit holes in bark of ash tree.*

*The bark on this ash tree (above) has split due to EAB larvae feeding under the bark.*

### **What is being done?**

It is only practical to chemically treat individual trees in the landscape but not ash stands in a forest setting. That doesn't mean the trees in the forest are without hope. There is a considerable amount of effort going into releasing biological control agents to try and combat the EAB. Currently in Kentucky there are three different species of parasitic wasps being released in various locations. These wasps have undergone extensive testing to ensure that they will not host shift and attack native U.S. borers, and that they are not harmful to species that may ingest them. People may be alarmed that wasps are being released into the environment but these wasps are so tiny, about 1/8-inch in size, that they are incapable of stinging a human.

The species we are releasing include two larval and one egg parasitoid that have been found to be effective at keeping EAB populations at a manageable level in their native range of China. A parasitoid lays an egg either on or in its host. The egg then hatches and the wasp larvae feed off of the host until pupation occurs. All that is left of the host larvae at that point is an empty skin. Parasitoids are effective biological control agents partly because they tend to be very host specific compared to a predator. This cuts down on non-target species being affected.

Potential locations for parasitoid releases are screened to make sure the site gives the best chance for parasitoid establishment. One criterion is that EAB has been found in the area but the trees are still actively growing and not showing extensive decline. Areas in Kentucky that have passed this and other criteria put forth by the USDA include natural areas in the following counties: Fayette, Kenton, Boone, Franklin, Shelby and Jefferson. There has not yet been any follow-up work to determine if the wasps have established in these areas.

#### **About the Authors:**

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# Recommendations for Ash Management in Kentucky

by Jeff Stringer



*EAB infested woodlands.*

*Photo courtesy: Leah Bauer, USDA Forest Service Northern Research Station, Bugwood.org*

**W**ith the emerald ash borer (EAB) slowly spreading in Kentucky, woodland owners are increasingly faced with deciding how to manage their ash. This article provides information and recommendations for those who have ash in their woodlands and those who are contemplating establishing hardwood plantations.

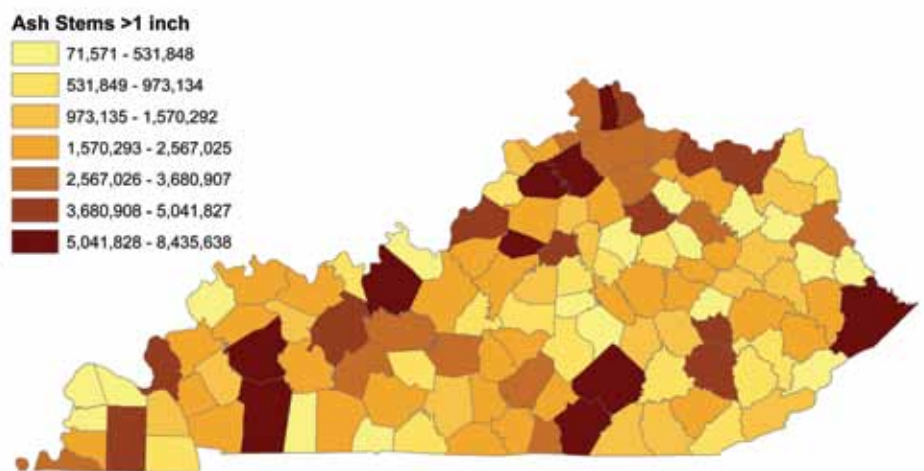
## **Background**

Kentucky has two widely spread ash species, white and green, and blue ash that is common to the central bluegrass region of the Commonwealth. All of these species are susceptible to being killed by EAB. White ash is an upland ash found throughout the state but is particularly plentiful in northern Kentucky. Green ash is typically found along the river and stream bottoms of Kentucky. Interestingly there is also an upland variety of green ash called red ash that also occurs in conjunction with white ash on upland sites. Regardless, woodland owners must make decisions on how to manage in the face of invasion by the emerald ash borer. Figure 1 shows the distribution of ash in Kentucky. The map shows that ash occurs throughout the state at a relatively low level; however, there are areas where it is clearly prominent. Some

woodland owners in northern Kentucky, for example, may have as much as 20 or 30 percent ash in the main canopy of their woods. However, there are other regions where ash is scarce and woodland owners may not have any present in their stands. Regardless, there are thousands of woodland owners throughout Kentucky that have ash and must make decisions regarding its future in light of EAB invasion.

EAB is a small insect that attacks trees of all ash species regardless of size or vigor. Left untreated trees that are infested will die. The small 1-inch-long emerald-colored

**Figure 1. Distribution of Ash Stems in Kentucky (2011)**



Source: Kentucky Division of Forestry and the U.S. Forest Service Forest Inventory Analysis Program

flying adult lays eggs in the bark of ash trees, and the 1- to 1.5-inch white larvae grub eats and tunnels around in the inner bark. Multitudes of feeding larva ultimately girdle the inner bark of the tree, starving the roots of food produced by the leaves. Over the course of several years the tree dies. The wood, however, is not directly harmed by the grub. Although treatments have been approved to keep EAB out of smaller yard and urban trees, there are not similar approved treatments that can be used in the woods or in forestry plantations. Therefore, as of right now woodland ash is at risk. The risk is based on the local presence of EAB.

As of 2012, there are large regions of the state that are still EAB free and may remain so for some time. In counties where EAB has been found, a quarantine is required. Understanding how the EAB quarantine works will allow woodland owners to make good management decisions. The quarantine places a restriction on the movement of ash logs, lumber and all hardwood firewood from the quarantined area. The restriction on hardwood firewood is because pieces of ash are too difficult to recognize when mixed in with other species.

To move any ash out of a quarantined area, the owner of the ash logs, lumber or hardwood firewood (generally a logger or sawmill) must get a compliance agreement. This compliance agreement is free of charge and easy to obtain, however it is a binding document that requires specific procedures for moving ash from the quarantined area. In the winter (October to April) the Compliance Agreement allows the movement of ash untreated but requires the place where the ash is going to also have a Compliance Agreement. The summer (April to October) is flight season for the EAB adults and those having a Compliance Agreement are required to heat treat, fumigate or, in the case of logs, debark all ash before it can be moved out of the quarantined area. These requirements normally stop loggers from cutting ash in the quarantined area in the summer when the logs have to be transported outside of the quarantined area. Woodland owners located in a quarantined area and that have a significant amount of ash in their stands should develop timber harvest agreements that provide enough time for cutting ash during October to April.

A Compliance Agreement is required only when ash or hardwood firewood is moved out of the quarantined area. Cutting and hauling ash or firewood within the quarantined area is business as usual and no Compliance Agreement is required.


The by-product of quarantine stipulations can be a reduction in the stumpage value (the value of timber as standing in the woods) of ash. Initially when the quarantine occurs, stumpage values can go down dramatically, especially if the quarantined area is small, like one or a few counties. Loggers will often not have a Compliance Agreement nor will local sawmills. Once they have them, ash can legally start moving again.

If the quarantined area is relatively large with one or more sawmills located in the quarantined area, loggers


can cut and haul ash without a Compliance Agreement. However, there is still a reduction in stumpage value for ash even in large quarantine areas because sawmills are required to ensure that all green or air-dried ash boards they produce are wane free if they are in a quarantined area and are shipping outside of the quarantine. They must have squared and clean edges if they are going to ship the lumber, and this requirement reduces yield by 15 to 20 percent and reduces the money they will pay for logs brought to them by loggers. Consequently the logger, or anyone buying timber, will pay less for ash stumpage. Mills that kiln-dry ash are required to have the ash certified before shipping outside of a quarantine area. The requirements create more handling and paperwork for ash, which tends to soften log values.

### ***Managing Ash***

Management of ash should consider the size and merchantability of ash trees within a woodlands as well as the threat from EAB. These two factors guide the recommendation for ash management through three different threat levels: green, yellow, and red.



***No EAB in  
Your Woodlands***



***No EAB  
in Region***

***Threat Level: Green***

In woodlands with no EAB infestation that are located in regions of the state where no EAB has been found, existing ash can continue to be managed as usual. If you are interested in timber revenue, cut ash when it is economically mature, typically 18 to 20 inches in diameter and up. However, ash this size can also be retained unless EAB conditions change. Immature ash can be allowed to grow, however, money and effort should not be spent in developing ash in these woodlands. For example, it is not recommended to conduct a crop-tree release and select ash as a crop tree. There is no problem with leaving uninfested ash in the stand, but spending money on these trees may not be prudent. Note that there is no evidence that improving the vigor of ash trees, which could be accomplished with a crop-tree release, will render them more resistant to EAB infestation or subsequent mortality. However, if you leave ash in your woodlands but have not spent money on it or have not increased the proportion of ash, you will develop mature ash if no EAB shows up, and you have not lost anything significant if it does. If you are considering planting a mixed hardwood stand, including ash in the mix may be problematic. However, as long as the percentage of ash is relatively low, planting is not a problem. It is not recommended to establish single species plantings of ash (which is typically not done) or to establish plantings where ash is a significant proportion of the planting. Since ash is not a particularly important wildlife food, the issue of reducing ash in mixed species plantings is not a significant issue.

Kentucky Woodlands Magazine - Volume 7 Issue 2

5

*No EAB in  
Your Woodlands*

*Region Infested  
but Not Local*

**Threat Level: Yellow**

In woodlands where EAB has not been found but the region contains EAB, it is important to plan for eventual EAB infestation. Use a forester to help provide advice and specifically a consulting forester to determine the current value of ash sawlogs and veneer. If their value is not extremely low, consider selling the mature ash. Immature ash can be retained and allowed to continue growing. If your woodlands is in a quarantined area, allow enough time in the timber harvest agreement to allow the logger to cut and haul between October and April, the only feasible time that they are allowed to haul ash outside of the quarantine area.

No money should be spent on treatments to encourage ash growth, as discussed previously. If you have a significant amount of economically immature ash, discuss this issue with your local forester and develop a plan to deal with small diameter ash if an EAB infestation develops locally or in your woodlands. Planting of ash is not recommended.

*EAB in Your  
Woodlands*

*Locally  
Present*

**Threat Level: Red**

In woodlands where there is an infestation of EAB or if an EAB infestation is in close proximity, all ash, including both economically mature and immature, should be cut and sold. The timing of this activity should be determined with the assistance of a forester. Merchantable sawlogs of ash (greater than 12 or 14 inches in diameter) can retain solid wood even after EAB is present or after they have been dead for a short period of time (up to one year). It is important to consider logging these trees even if timber is not your primary objective. Leaving standing dead trees (snags) provides food and habitat for some wildlife species and a certain number of snags are typically recommended for wildlife management. However, a large number of snags represents a safety hazard from widow makers (dead branches), and removal of trees within two years after they have died is recommended. As indicated previously, provide enough time in a timber harvest agreement for loggers to remove ash from October to April if they are hauling the ash outside of the quarantine area. No effort should be directed towards trying to culture ash in these woodlands either through planting, timber stand improvement or crop-tree release.

**Summary**

EAB continues to spread in Kentucky. Ultimately how many counties will be infested is unknown. This predator poses a risk for woodland owners who have ash in their woodlands and is especially important for woodland owners in central and northern Kentucky.



*Photo courtesy: Joseph O'Brien, USDA Forest Service, Bugwood.org*

***If you have ash in your woodlands, have a plan in place for how you are going to deal with the emerald ash borer. Don't wait until all your ash trees look like this.***

If you have ash present you should consult with your forester to plan for its management and make contingency plans. Generally if no EAB is present in your region you can continue to feel comfortable with business as usual with the exception of not spending a significant amount of money improving your ash. If EAB is present in your region you need to start to consider selling your mature ash. If you have EAB in your woodlands or it is present locally you may want to consider liquidating both your mature and immature ash. Remember to provide enough time in timber harvest agreements so that loggers can cut and haul ash from October to April. Recognize that every woodland is different and timber markets and the EAB infestations can change quickly. Discussing your options and making contingency plans with a forester that is up-to-speed on the EAB situation is recommended.

For more information about the Emerald Ash Borer and how to deal with ash on your property please visit:

- [www.ca.uky.edu/forestryextension/EAB.php](http://www.ca.uky.edu/forestryextension/EAB.php)
- <http://forestry.ky.gov>
- [www.kacf.org](http://www.kacf.org)

**About the Author:**

**Jeff Stringer, Ph.D.**, is a extension professor at the University of Kentucky and is responsible for continuing education and research in hardwood silviculture and forest operations. He is also an editor of the Kentucky Woodlands Magazine.

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## *From the Woods...*

*Kentucky Woodlands Magazine interviewed Dr. Maurice Cook, Franklin County woodland owner, to learn about his experiences with the emerald ash borer on his property.*

**KWM:** Please tell us a little about the management objectives for your property.

**Maurice Cook:** My primary objective is to have a healthy, sustainable woodland that will produce good timber and also enhance related natural resources. To achieve this objective, I have done (or am doing) the following things: 1) Completed a post-harvest timber stand improvement program following a timber harvest in 2000; 2) Currently practicing hardwood crop tree release through the Conservation Stewardship Program administered by NRCS; 3) Currently implementing Forestry BMPs for soil erosion control and watershed protection.



*Maurice Cook, his wife and granddaughter.*

**KWM:** How did you learn you had emerald ash borer on your property?

**Maurice Cook:** Ben Lyle, Forester with the Kentucky Division of Forestry (KDF), advised me of that fact some time in 2008. Ben had observed signs of declining ash trees in 2006. However, the presence of emerald ash borer (EAB) was not confirmed until two years later. I understand that my property has the dubious distinction of being the first confirmed EAB site in Franklin County.

**KWM:** Has the presence of emerald ash borer impacted the management of your property? If so, how?

**Maurice Cook:** It has modified the timetable for my next timber harvest. Ash was a significant tree species on the property and much of it would have been ready for harvest in the next 3-4 years. When the presence of the EAB was confirmed, Ben Lyle and I discussed the situation and decided that the volume of ash trees was too low to justify a harvest. Furthermore, the modest amount of revenue generated from an ash tree harvest would have been offset by damage to saplings and crop trees. Oak regeneration on the ash tree sites is going extremely well. The consequence, though, is that the next harvest is now about 10 years away in order for more of the oak trees to reach a desired size for harvest, and for the very small (1-2 inch diameter) oaks to become large enough to avoid being uprooted or permanently damaged by the timber harvesting process.

**KWM:** What advice do you have for other woodland owners that are currently dealing with emerald ash borer or might have to in the future?

**Maurice Cook:** FIRST AND FOREMOST, get assistance from a professional forester. That individual can tell you if you have the EAB, which gives you a starting point in planning how to deal with it. Even if you don't have the EAB, a professional forester can help you plan in the event you do have it--which is highly probable considering the aggressiveness of the EAB being what it is. I am an absentee landowner. Thus, I have found the services of the KDF absolutely essential in enabling me to achieve the objectives I have for my woodland.

# MOVING FIREWOOD TRANSPORTS TREE-KILLING INSECTS AND DISEASES



Tree-killing pests hitchhike on firewood - spreading insects and diseases that destroy our street trees, forests and natural areas.

Protect your favorite places from this threat:

- Buy locally harvested firewood.
- Tell your friends not to move firewood.
- Ask a park ranger or campground host about where to get local firewood when you travel.
- Use firewood from nearby sources to heat your home or cabin.

**Buy it where you burn it.**



# Planning for the Future of Your Woodlands

[www.kwoa.net](http://www.kwoa.net)

by Henry Duncan, KWOA President

Creating sustainable woodlands is a multigenerational task. Unlike most other agriculture enterprises, the revenue we receive from our woodlands is the result of plans and efforts of someone who preceded us. Likewise, investments we make on our woodland are not only for current operations but for the benefit of those who follow us. These properties can be looked upon as much more than current financial assets. They are priceless heirlooms and we feel a deep responsibility to care for these properties and to hand them off to our successors in better shape than we found them. Estate planning must be a serious consideration for woodland owners.

## **Tax issues and your woodlands:**

### **KWOA representatives testified before the Governor's Blue Ribbon Tax Reform Commission.**

A recent study by the UK Department of Forestry has shown that Kentucky is one of the leading hardwood producing states in the United States and the Kentucky forest and wood industry has a direct economic impact of over \$6 billion and employs more than 25,000. The foundation of this wood industry is the timber growing on Kentucky's woodland owners properties. The UK Department of Forestry has developed a formula to correctly assess the taxes on certified managed timberland relating to income production. This new formula, if enacted, will provide economic incentives for woodland owners to pursue certification and a higher level of long term management of Kentucky's woodlands. KWOA representatives attended the Commission's meeting in Lexington urging them to see that the new formula is used and we are in contact with legislators to advance these concerns.

**Income tax and woodlands.** Information can be found on the U.S. Forest Service's Forest Taxation website that deals with all the forest related tax laws. "A Federal Income Tax on Timber: A Key to Your Most Frequently Asked Questions" and many other publications are available free online at [www.fs.fed.us/spf/coop/programs/loa/tax.shtml](http://www.fs.fed.us/spf/coop/programs/loa/tax.shtml)

## **Kentucky Division of Forestry Updates:**

**The Kentucky Division of Forestry has been targeted to reduce their manpower by about 30 positions.** KWOA board members and other woodland representatives recently met with the Secretary of the Energy and Environment Cabinet to explain the importance of the Division to Kentucky woodland owners and requesting for level funding to maintain the Division's important missions. It is emphasized that such a reduction would have a serious adverse effect on woodland owners.

**Service Forester Award:** Woodland owners are invited to nominate your Service Forester to be recognized at the Kentucky Woodlands annual awards meeting. You are encouraged to review the nominating guidelines by visiting the KWOA web page at [www.kwoa.net](http://www.kwoa.net)

## **KWOA/KWOF Annual Meeting**

Blue Licks State Park  
April 9-10, 2013

The Kentucky Woodland Owners Association and Foundation Annual Meeting will convene April 9 - 10, 2013 at the Blue Licks State Resort Park in Robertson County. Woodland owners will interact with forestry professionals and their woodland owner peers about issues and topics regarding the management of their properties. Attendees will travel through the woodlands with Kentucky Division of Forestry Service Foresters conducting hands-on management practices. We will also recognize forestry leaders and the Service Forester of the Year.

Lodging is limited at the Blue Licks State Park. Reserve your accommodations early and plan to attend this informative and recreational event. Call 800-443-7008 / 859-289-5507 and mention KWOA for room reservations.

For more specifics on the meeting and agenda visit: [www.kwoa.net](http://www.kwoa.net)

Have you visited the [www.kwoa.net](http://www.kwoa.net) website lately? You will be amazed with the amount of woodland information available to us at this site...both current and archived information... along with valuable related links. Karen Marshall and Ken Cooke are to be thanked for supplying us with this wealth of information.

**For more information log on to [www.kwoa.net](http://www.kwoa.net)**

# FORESTRY 101

## Woodland Roads

by Chris Osborne

**W**oodland roads are an integral yet often overlooked part of forest management. These roads are a woodland owner's gateway to enjoying their woods, and good woodland roads are critical to protecting and managing woodlands. Just as state and county road departments maintain their roads, landowners should maintain their roads. For many woodland owners this means keeping them well drained and keeping them clear of brush and debris.

### *Daylighting*

Although some maintenance may be needed to rectify an already occurring issue, some preventative steps can be taken to mitigate degradation of your road system. One of the most obvious and destructive forces to woodland roads is water. A simple yet often overlooked tool for improving the condition of your road is increasing the amount of sunlight reaching the road. Daylighting a road can be achieved by clearing brush, limbs, or even trees which shadow the road and prevent those wet or soggy areas from drying.

### *Water Control*

Once adequate sunlight is reaching the road, begin evaluating your road by asking yourself, "Does the water have a place to go"? If the answer is yes, then your road is sloped in a manner which doesn't allow for standing water or there are drainage controls (culverts or ditch lines which direct flow) in place. If the answer is no, then you should begin by looking at changing the slope of the road or creating a ditch line. The slope of the road should direct water to either a ditch line or to the downhill side so that the water isn't running along the road. Although equipment such as a bulldozer will work best for this operation, one would be surprised at the efficiency of a farm tractor with a loader attachment. However,



*Photo courtesy: Daniel Bowker*

*Woodland roads are an enjoyable and important asset for woodland owners. They provide access to your woodlands facilitating their use and management while also serving as fire breaks in the event of wildfire.*

road locations are sometimes dictated by topography. When roads are on an incline, rutting is always an issue of concern. Broad-based dips are an ideal way to limit the distance water can travel down the road before being diverted. Large rocks or cliffs often inhibit the ability to create ditches; in this situation, sloping and diversion are musts. These dips create an undulation in the road where a sloped low spot acts as a catch basin for the water and diverts it into vegetation to the side of the road. Getting the water off the road is a big step in winning the battle of road erosion.

### *Fixing Mud Holes*

Even if the road has adequate sunlight and is draining properly, there may still be issues. There are also spots on the road that are prone to turning into mud holes. The quick fix is to simply throw gravel into them and hope for the best, but generally this does not fix the problem over the long haul. In a section of road which tends to hold water or is very soft or unstable, consider using a geotextile fabric. The fabric is water permeable, which allows the water to move through the material but holds stone in place. This fabric typically comes in large rolls covering approximately 500 square yards. The rolls range in price,

depending on the product, from \$200 to \$600. Most suppliers which carry culverts will also carry this fabric. To apply this material, you must first smooth the road as best as possible and divert water to the best of your ability. The fabric is then rolled out along the area to be repaired. The fabric should extend slightly beyond the area to be repaired. At this point it is best to stake the fabric in place.

Begin by dumping a large amount of gravel at one end of the fabric (#2 gravel works well). It is important to place the gravel at one end and then pack it across the fabric. Never drive across the bare fabric as it will tear and shift. As you progress with the gravel you can then drive across the area containing the gravel. The stone should be placed about 4 inches thick and should cover the fabric entirely.

Once the large stone is in place, smaller gravel is placed as a final cap. About 2 inches of a smaller stone such as #57 works well. Once complete the fabric shouldn't be visible and the 6-inch cap will provide a sturdy path for travel. Similarly, this fabric isn't limited in its use to sections of road but can also be utilized in smaller applications such as pot holes. Simply cut the fabric so that it extends slightly beyond the edges of the hole and then fill with gravel; capping isn't necessary in this situation.

These are just some of the measures that can be taken to correct or prevent problems associated with forest roads. If you would

like further information regarding road maintenance or direction relative to specific instruction, the Internet is a great place to start. Search for information on forest or woodland roads. Forestry Best

Management Practices (BMPs) guidelines also include information on building and maintaining woods roads. Every state has forestry BMPs, including Kentucky, and these are good sources of information. Kentucky's forestry BMPs can be found at [www.ca.uky.edu/forestryextension/Publications/FOR\\_FORFS/FOR67.pdf](http://www.ca.uky.edu/forestryextension/Publications/FOR_FORFS/FOR67.pdf). Another reference for woodland roads can be found at [www.na.fs.fed.us/spfo/pubs/stewardship/accessroads/accessroads.htm](http://www.na.fs.fed.us/spfo/pubs/stewardship/accessroads/accessroads.htm).

#### About the Author:

Chris Osborne is the Management Forester at the University of Kentucky's Robinson Forest in eastern Kentucky. Chris coordinates, conducts, and documents forest management activities at Robinson Forest. He facilitates the use of Robinson Forest by those approved to conduct teaching, research and Extension activities.

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*The accumulation of water on woodlands roads (above) creates erosion and access problems. If this is a persistent problem on your woodland roads then consider using geotextile fabric and gravel to address the issue.*

*Photos courtesy: Chris Osborne*



*Once you have smoothed the road surface roll out the geotextile fabric (above) and dump a large load of gravel on one end. Do not drive directly on the fabric as it is subject to tearing and shifting.*



*Spread the gravel (above) across all the fabric to a depth of four inches and then apply another two inches of smaller gravel as a final cap. The geotextile fabric should not be visible when you are finished.*



*Broad based dips are a water control structure that collects water from the uphill side of the road (surface and ditches) and diverts it across the road to a stable outlet. They work best on roads with slopes of less than 10%.*



# Kentucky Tree Farm Committee Newsletter

## *Kentucky Tree Farm Program to Undergo 3rd Party Certification Assessment*

The American Tree Farm System (ATFS) provides information and resources to help landowners reach stewardship goals and properly manage their woodlands. ATFS is the largest and oldest sustainable woodland system in America, and they offer resources to improve management and recognition for good forest stewardship on private forestlands to certified Tree Farms in Kentucky.

ATFS continues to seek international recognition for proper management practiced by all certified Tree Farmers. Harvested forest products from Tree Farms are also certified sustainable by international standards. ATFS is internationally endorsed by the Programme for the Endorsement of Forest Certification Systems (PEFC). Affiliation with PEFC strengthens ATFS by providing landowners increased opportunities in the sustainable forest products market.

As part of this recognition the Kentucky Tree Farm Program will undergo a third-party certification assessment during the summer of 2013. Each year a sample of state Tree Farm programs is selected for review. This annual assessment process helps ATFS better understand how to serve landowners, especially in their work to meet the 2010–2015 Standards of Sustainability. These assessments have consistently recognized the good forest management practiced by Tree Farmers. The standards cover all aspects of good forest management, which Tree Farmers must keep in mind when planning and conducting activities in their woods.

This assessment is important for the program in two ways. First, the assessment affirms the great work in managing forests. Second, the assessment is an

opportunity to review how well the program operates and how the organization can better serve the landowner. To perform the certification assessment of the Kentucky Tree Farm Program, a random sample of Tree Farms is selected for on-site visits by the professional foresters from Pricewaterhouse Coopers (PWC), the organization that gives ATFS third-party recognition in Kentucky. If a Tree Farm is chosen in the random sample for site visits, the Kentucky Tree Farm Committee will contact the landowner between February and April 2013.

As the assessment approaches, the Kentucky Tree Farm Committee urges all Tree Farmers to make sure that their property management plan is up to date along with the information pertaining to the proper contacts and acreage under management. If there have been any changes on the Tree Farm the local inspecting forester can be contacted to make sure that all information is correct. This is also a great time to update the forest management plan to reflect the 2010-2015 Standards of Sustainability. If you would like a copy of the ATFS Management Plan Addendum, a tool to use while updating your management plan, you can contact your local forester or call Pam Snyder with the Kentucky Tree Farm Committee at (502) 564-4496.

If any landowners have a question concerning the Tree Farm Program or any forest management or private land issues you can contact your local Kentucky Division of Forestry office. The Division has a staff of foresters that can assist private landowners with development of a management plan for the property and offer advice on activities to meet landowner objectives for their forestland.

## *Tree Farmer and Logger of the Year Finalists for 2012 Named*

Representatives of the Kentucky Tree Farm Committee are performing site visits to all the finalists over the winter and the winners will be announced in April at the Kentucky Forest Industries Annual Meeting.

We would like to congratulate all the nominees and the finalists!

### **Tree Farmer of the Year Finalists:**

- Harry & Karen Peele (Taylor County)
- Perry & Margaret Sebaugh (Edmonson County)

### **Logger of the Year Finalists:**

- Marion and Ronald French Logging (Breckinridge County)
- Dwayne Wilson Logging (Allen County)



Photo courtesy: Billy Thomas

*A field day was recently held at the Mike and Cindy Harvey Tree Farm to celebrate their winning the Kentucky Tree Farmer of the Year award in 2011. A big thanks to Mike and Cindy for hosting the event and to the Taylor County Extension Office, UK Forestry Extension, Kentucky Division of Forestry, Kentucky Sustainable Forestry Initiative Implementation Committee, Kentucky Forest Industries Association, and the Kentucky Department of Fish and Wildlife Resources for helping the Kentucky Tree Farm Committee put on this event.*

Photo courtesy:  
Kelly Oten, Bugwood.org



Photo courtesy: Chris Evans, Illinois Wildlife Action Plan, Bugwood.org

The hemlock woolly adelgid is a small insect that feeds on hemlock needles and is a serious threat to all hemlocks in Kentucky.

# Hemlock Woolly Adelgid Update

by Alice Mandt and Brandon Howard

**T**he hemlock woolly adelgid (HWA) is a small insect that threatens the health of the eastern hemlock (*Tsuga canadensis*). This insect damages trees by feeding on their starches, a process that begins during the late fall when nutrients are abundant and predators are scarce. Once a tree becomes fully infested it typically takes 4 to 6 years for it to succumb to the insect and die.

HWA occurs naturally and has been genetically traced to Asia and the western United States. In its native range, the insect causes little to no damage. The first report of HWA in the eastern United States was in 1951 near Richmond, Virginia. Since that time, HWA has spread from Maine to Georgia leaving a 90% mortality rate in its path.

In northeastern North America, HWA are all female and develop asexually. They have six stages of development and two generations per year. Adults from the first generation lay up to 300 eggs and crawlers from the second generation deposit an average of 75. This allows populations to build to incredible numbers and makes HWA a devastating forest pest.

## HWA in Kentucky

HWA was first discovered in Kentucky in Harlan County in 2006 and has since been reported in 21 additional counties. According to U.S. Forest Service inventory and analysis data, there are more than 76 million eastern hemlock trees at risk across the state.

Hemlock trees are most often found in the deep ravines of eastern Kentucky where they serve as a foundation for streamside communities and are responsible for casting deep shade. Their dense

canopy regulates light penetration to the forest floor which in turn maintains air, stream and soil temperatures. Hemlock trees are also an important determinant in stream chemistry and sedimentation rates. It is feared that impacts from HWA will not only result in a loss of millions of trees, but will eventually lead to a significant alteration of a long established ecosystem.

## HWA Management in Kentucky

In 2007 a partnership of citizens, nonprofit organizations and government agencies formed under the name Save Kentucky's Hemlocks (SKH). The mission of this group is to share limited resources in an effort to lessen the impacts HWA will have in Kentucky. As a beginning strategy, the group focused on raising public awareness by organizing events. One such event was the *Tsuga Art and Music* show in Lexington, Kentucky.

In 2010 the Kentucky Division of Forestry (KDF) partnered with the U.S. Forest Service to create a full-time position for an HWA coordinator to expand the efforts of SKH. Since that time, KDF has developed a program that specifically addresses HWA with respect to partnership coordination, monitoring, education, chemical acquisition, public outreach and funding.

HWA control



methods in Kentucky cover three different strategies: cultural, chemical and biological. Cultural control methods are mainly used by private landowners with smaller acreages to protect. There is very little that can be done to control the natural spread of HWA, but there are things landowners can do to reduce the likelihood of HWA thriving in their backyards. They include maintaining tree health, keeping trees watered during dry seasons, removing bird feeders during the spring and summer, pruning limbs that are likely to come into contact with foot traffic and not using fertilizers if you are located near an infested area. Regular monitoring of trees for infestation is an effective way to catch HWA in its early stages.

Managing HWA over thousands of acres is a much more difficult task. The goal of large scale HWA management is to preserve the genetic integrity of the eastern hemlock long enough to allow the species to survive and recover. Insecticide treatments are currently the most effective approach, making them a key part of Kentucky's suppression efforts. Chemical control efforts began across the state in 2006. Since that time, thousands of hemlock trees have been treated on state, private and federal properties.

One of the leaders in HWA suppression is the Cumberland Gap National Historical Park (CUGA). HWA was first found in CUGA in November 2006. Over the next year, areas were prioritized according to location of trees near facilities, trails and roads. Chemical treatment of individual trees began during the following winter. After all the potentially hazardous trees had been treated, efforts to save hemlock trees progressed to the watershed level. Today, the park is working mainly in the back country area, continuing watershed level treatments. Since 2007, the park has treated over 37,600 trees. Chemical treatments will continue this winter and next spring in the back country areas.



*This hemlock has responded favorably following chemical treatment in the previous year.*

*Photo courtesy: Alice Mandt*

Examples of similar treatment programs are happening across Kentucky. Some of the most aggressive HWA programs are currently taking place at the Daniel Boone National Forest, Kentucky Ridge and Kentenia State Forests, Blanton and Bad Branch State Nature Preserves, Cumberland Gap and Big South Fork National Parks, Lilly Cornett Woods, Stone Mountain and Shillalah Creek Wildlife Management Areas, Cumberland Falls and Natural Bridge State Parks. To see your favorite public land on the list, please contact a local KDF office to start a volunteer program in your area.

These large scale treatment programs can become both costly and labor intensive. The long term management strategy for HWA lies in biological control. Natural predators from the native range of HWA are being intensely

studied and tested for release into our natural areas. If this method proves effective, predator populations will build with HWA populations giving large scale control of HWA.

Research into HWA impacts and biological control is currently underway in southeastern Kentucky. The University of Kentucky Entomology Department has been instrumental in leading the effort, alongside Virginia Tech who has also established research plots on Kentucky Ridge State Forest. Current projects include examining the impacts of hemlock loss to the ecosystem, developing field insectaries for HWA predators and determining if both chemical and biological control methods can be used in close proximity, a method previously thought to be detrimental.

### **Tree Harvesting**

Complete control of HWA in an urban or residential setting can be practical, but when landowners are faced with deciding what options are available for large tracts of hemlock, a more detailed degree of planning must be considered. One of the hemlock's most important contributions to the environment is how they regulate the temperature of the streams year round. Areas along streams containing water year round or during rain events are called "Streamside Management Zones" (SMZs). Caution should be used when logging near streams. Information regarding "Best Management Practices" (BMPs) for logging in SMZs can be found through the KDF or UK Extension office.

On a commercial value scale hemlocks are commonly near the bottom in most markets, but commercial operations can be viable if the volume of hemlocks is large enough to attract a buyer. Some specialty markets, such as log home construction, exist in certain parts of the state. These markets may be willing to pay more than typical prices for hemlocks.

Landowners may find more value in using their hemlocks for building materials on their land. If so, a portable band mill could be used and would remove the need to haul logs to an off-site mill. Using a portable band mill will allow the landowner to cut different size lumber for specific needs on their land. An ideal use of hemlock lumber is siding on a house, barn or other out buildings where the landowner is well served by the rot resistant characteristics of hemlock. If a hemlock can't be saved by chemical methods that are cost prohibitive due to the volume of hemlocks on the property, utilization of the timber might be a better option than leaving it to decay in the woods. The lumber should still be viable if the tree has green needles. Considering your options before the trees are in major decline can provide you with building materials (or profit), a stable ecosystem and peace of mind.

#### **About the Authors:**

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# Using Midstory Removal to Enhance Oak Development

by David L. Parrott, John M. Lhotka, Jeff W. Stringer

Managing for oaks is an objective shared by many woodland owners. Oaks are among the most valuable timber species within the region and serve as a valuable source of nutrition for wildlife. While a historically dominant tree species within Kentucky and other central hardwood forests, changes in disturbance patterns have created difficulties in maintaining oak dominated forests, particularly on medium and high quality sites. After clearcuts and other harvests that create open environments, fast growing species like yellow-poplar and understory species like maples are replacing oaks. Investigation of methods that can improve the regeneration of oak are needed to help woodland owners and foresters retain oaks in our woodlands.

## Problem

Previous research has shown that the difficulties in keeping oak in our woodlands following regeneration harvests are due to lack of tall and vigorous oak seedlings being present in the woodlands prior to harvests. Oak seedlings should be at least 3 feet tall in order to be competitive after a harvest. Although some oaks, particularly white oak, can persist as seedlings in shade, they require intermediate levels of light in order to grow to competitive sizes. Because of changes in disturbances and the absence of fire, species that can grow in low light environments such as red maple and American beech have often developed dense understories in many woodlands, especially those of medium or high quality. Under these understories, light levels are extremely low and inhibit the development of oak seedlings. Therefore, management activities to improve the abundance of competitive oak seedlings must include increasing light levels while ensuring that too much light does not stimulate competitors such as yellow-poplar. This fine-tuning of the light allows oak seedlings that are present to grow in height and vigor so that they can compete when the stand is harvested. Studies have shown that removing the midstory can increase the growth and survival of various oak species. Determining how to implement these midstory removals is a necessary step to ensure the continued presence of oaks in Kentucky forests.

## Research Project

In 2004, the University of Kentucky Department of Forestry began investigating the effects of midstory

removal on intermediate quality sites within Berea College Forest in Madison County, Kentucky. This study, initiated by Dr. Jeff Stringer and Dylan Dillaway, was designed to monitor the impact removal of the midstory had on the survival and growth of natural and underplanted white and black oaks as well as red maple, which is an oak competitor. Plots were established throughout the forest, a number of them receiving a midstory removal where red maple and beech were killed (midstory removal treatment) and a number of them where these species were left in place (control). Midstory removal treatments were performed by removing sapling and pole-sized red maple, beech, blackgum and similar species. Trees were taken out by starting with the smallest trees with 1-inch diameters and working up to taking out larger trees until approximately 20 percent of the basal area was removed. This treatment did not

remove any main canopy (dominant or codominant) trees. All stumps were treated with herbicide to prevent resprouting. Within each plot, white and black oak 1-0 bareroot seedlings were planted, and natural white and black oak and red maple seedlings were tagged, measured and followed. Initial research by Dillaway and Stringer



Photos courtesy: David Parrott

*Oak seedlings are finding it challenging to successfully compete under heavy midstory canopies. Research is ongoing to find ways to ensure that oaks will be a part of Kentucky's forests in the future.*

found that oak seedlings responded in diameter and root carbohydrate levels, indicating that the midstory removal was working. However it would take time to determine if treatment was helping the oaks in a meaningful way. Seven years after this initial work, Dr. John Lhotka, Dr. Stringer, and David Parrott returned to these plots to measure the height, ground line diameter, and survival of the trees as well as the light levels in plots.

## Results

Light measurements indicated that the midstory removal increased light levels from 5.3 percent of full sunlight in the control (undisturbed) plots to 14 percent full sunlight in the midstory removal plots.



*A. Dense midstory canopies (a) limit light availability to oak seedlings below the midstory canopy.*



*B. The removal of the midstory (b) prior to the harvest increases the amount of light that reaches the developing oak seedlings.*



*C. Seven years following the midstory canopy removal (c) the oak seedlings have responded and are much more likely to be a part of the dominant canopy following a harvest of the overstory trees.*

Photos courtesy: Jeff Stringer

This change in light had a significant impact on the oak seedlings. Before midstory removal, all natural and underplanted seedlings were the same size, but after seven years, natural and underplanted white and black oak seedlings were 7.6 to 18.5 inches taller in the midstory removal plots. Within the treated areas, seedling heights ranged from 1.5 to 2.5 feet, and ground line diameters were 0.1 to 0.2 inches larger than in the control. In addition to size, treatment increased survival 16 to 32 percent among species and reproduction types.

When looking at potential competitors, red maple also exhibited a positive response to the midstory removal. While red maple continued to remain a potential competitor, seedling inventories showed that the light levels created in the midstory removal did not encourage an emergence of fast growing species that can take advantage of high levels of light.

### Management Implications

Results from this study show that a midstory removal can increase the survival and growth of oak seedlings. Before performing a midstory removal, an abundance of oak seedlings must be present in order to take advantage of the treatment. As seen in this study, underplanting oaks is a viable option. This treatment is designed to be an initial step in a system to develop oaks that can be competitive and contribute to future stands. Since it can take 10 or more years for seedlings to reach competitive heights, implementation should occur several years before a final harvest. Following a midstory removal, seedlings should be monitored to ensure that oaks are responding to treatment. If further oak development is needed, removal of some overstory trees may be necessary in order to provide additional light. Once oaks have reached competitive heights, a final harvest can take place. Prior to or immediately following harvest, operations such as burning or competitor removal may be necessary to increase the probability of oak success.

#### About the Authors:

This research was conducted as part of a Masters research project by David Parrott ([david.parrott@uky.edu](mailto:david.parrott@uky.edu)), who is currently a technician in Dr. John Lhotka's silviculture lab at the University of Kentucky Department of Forestry. This research project was overseen and directed by Dr. John Lhotka ([jmlhot2@uky.edu](mailto:jmlhot2@uky.edu)), Assistant Professor of Silviculture, and Dr. Jeff Stringer ([stringer@uky.edu](mailto:stringer@uky.edu)), Extension Forestry Professor, of the University of Kentucky Department of Forestry.

#### Advertisements:

# New Tree Pests Threatening from the North and South

by Jody Thompson

Photo courtesy: Melody Keena, USDA Forest Service, Bugwood.org



## Asian Longhorned Beetle

During summer 2011, Kentucky learned of yet another invasive pest that can devastate our tree canopy. The Asian longhorned beetle (ALB) was found in Bethel, Ohio, just east of Cincinnati and only a few miles north of Kentucky. In the year since its discovery, this beetle has been found infesting thousands of trees in and around the area. Ohio is the fifth state to have the beetle since its arrival in the U.S. in the mid-1990s, and infestations are expected to spread. The ALB has not been found in Kentucky, but that doesn't mean that it won't one day.

The Asian longhorned beetle is a very different beetle than the emerald ash borer (EAB). EAB only kills ash trees—even though it affects large amounts of them at one time and spreads to kill trees quickly. ALB affects many different kinds of trees; its favorites seem to be maples, buckeye, birch, elm and willow. ALB is also different in that it moves into the xylem (farther inside the tree), which is out of the way of effective insecticides. Thus, ALB cannot be controlled chemically.

These pests are always spread by people, although not intentionally. They are spread in firewood, wooden crates, pallets, and woody debris from trees. Pests that live inside of trees can't be stopped by simply spraying a pesticide on a tree like we are used to doing with row crops or weeds.



The exit hole of the Asian Longhorned Beetle is a large circular hole in the bark. This beetle affects numerous tree species but seems to prefer maples.

Photo courtesy: Joe Boggs, Bugwood.org

Trees die all the time for many different reasons. However, if you begin to see circular holes about half the size of a dime in your trees and they aren't caused by woodpeckers, start asking questions.

More information about Asian longhorned beetle can be found at the following Web sites: [www.dontmovefirewood.org/gallery-of-pests/asian-long-horned-beetle.html](http://www.dontmovefirewood.org/gallery-of-pests/asian-long-horned-beetle.html) and <http://beetlebusters.info/>

If you notice anything that might fit the descriptions of the problems listed in this article, call your local County Extension or Division of Forestry office.

### About the Author:

Jody Thompson is the Forest Health Specialist with the Kentucky Division of Forestry. His responsibilities include monitoring, identification and education for insects, diseases and invasive exotic plants in Kentucky's woodlands.

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## Thousand Cankers Disease

In August 2010, black walnut trees found dying in the Knoxville, Tennessee area were determined to have thousand cankers disease (TCD), a fungal disease carried by a small beetle that originated in the southwestern United States. The fungus kills the tissue under the bark of the black walnut tree, and the infected tree slowly dies.

Since 2010, TCD has been found in several counties in eastern Tennessee, eastern Virginia and outside of Philadelphia, Pennsylvania. Recently, the beetle has been found in traps in Butler County, Ohio. TCD has still not been found in Kentucky, but there is no way to track its movement until it shows up in a new location.

During 2011, the Division of Forestry and UK Office of the State Entomologist with assistance from the U.S. Forest Service surveyed counties in high-risk areas of Kentucky. During the summer of 2012, the Division of Forestry and UK Office of the State Entomologist again surveyed high-risk areas but with the use of insect traps that included a newly developed pheromone lure.

Being a problem that is transported inside wood, such as with Asian longhorned beetle and emerald ash borer, there is no way to predict where it will show up next. Walnut, like other trees, can die from many causes, but the key signs to look for are many tiny holes found on the bark in addition to branches dying separately from the rest of the tree.

More information about thousand canker disease can be found at the following Web sites: [www.dontmovefirewood.org/gallery-of-pests/thousand-canker-disease.html](http://www.dontmovefirewood.org/gallery-of-pests/thousand-canker-disease.html) and [www.thousandcankers.com/home.php](http://www.thousandcankers.com/home.php)



The fungus that causes TCD is spread by the walnut twig beetle. The fungus creates small cankers under the bark that interrupt the flow of water and nutrients. Eventually the cankers become so numerous that they completely stop the trees flow of water and nutrients until branches and ultimately the tree dies.

Photo courtesy: Ned Tisserat, Colorado State University, Bugwood.org



The exit holes of the walnut twig beetle are very small and difficult to detect. Dying branches are generally one of the first signs noticed.

Photo courtesy: Whitney Cranshaw, Colorado State University, Bugwood.org



*Butternuts like the state champion in Pike County are becoming rarer and rarer because of the butternut canker disease. Butternuts are closely related to black walnut and are often called white walnut.*

*Photo courtesy: Diana Olszowy*

# I Can't Believe It's . . . Butternut!

*by Diana Olszowy*

## Kentucky Champion Tree Program

The community of Myra in Pike County, Kentucky is a small town located in the southwestern part of the county that has what many larger communities are envious of – a state champion tree. The champ is known as a butternut and is locally referred to as “white walnut” or “oilnut” and is a close cousin to the black walnut. Located on the property owned by Faith Baptist Church and next to the Myra Christian Academy, this beautiful specimen is quite content in its native surroundings and stands over and above all others.

Butternuts are not as common to Kentucky as they once were. Though they are not currently listed on the threatened or endangered species list, it is listed as a “Special Concern” species. This is mainly due to a serious disease called butternut canker. It has been estimated that nearly 80 percent of the butternut has been killed out by this pathogen. Learn more about Butternut Canker on page 21.

Butternuts are native to the eastern U.S., ranging from Michigan into New England and south to northern Alabama and northern Arkansas. They can grow in a variety of sites and at higher elevations than black walnut; however, they prefer stream banks and coves on well-drained soils. Butternuts average 60 to 70 feet in height and 15 to 30 inches in circumference with the exception of our champ, which is 88 feet tall and 110 inches in circumference (that’s more than 9 feet around).

Butternuts begin to produce seed around 20 years of age, and optimum production is from 30 to 60 years of age. Their nuts are similar in size to black walnut but instead of a round husk, butternut has an oval husk; they produce bountiful crops every two to three years. The nuts are sweet and have a pleasant flavor and are often used in baking and making candies. “White walnut” is more valued for its nuts than its timber. The wood is light in weight and highly rot resistant, but is much softer than black walnut wood and lacks the deep rich color. Bark and nut rinds were once finely ground up and used to dye cloth, and an extract from the inner bark was used to treat for smallpox, dysentery and other stomach and intestinal discomfort.

This butternut holds two champion crowns—one for the largest specimen in the state and the other, and definitely more important—it’s a survivor!



*The butternut leaf and fruit are similar to that of walnut but on closer inspection the differences become obvious. The husk of the butternut fruit is oval, hairy and sticky. Leaves are pinnately compound and contain 11 to 17 leaflets that are 2 to 4 inches long and wrinkled above.*

*Photos courtesy: Paul Wray,  
Iowa State University, Bugwood.org*

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# Forest Health



## Butternut Canker

by Diana Olszowy

**B**utternut (white walnut) is being killed throughout its range by *Sirococcus clavigignenti-juglandacearum* (Sc-j for short), a non-native fungus that was introduced into North America in 1967. The fungus initially infects trees through buds, leaf scars and other openings in the bark.

Spores produced on branches are carried down the stem by rain, resulting in multiple, perennial stem cankers that eventually girdle and kill infected trees. Produced throughout the growing season, the spores can survive and be dispersed long distances during cool weather. Branch cankers caused by the fungus usually occur first in the lower crown, and stem cankers develop later from spores washing down from cankers above. Cankers are elongated sunken areas, often with an inky black center and whitish margin. Brown-to-black elliptical areas of killed cambium can be seen under peeled bark. Older branch and stem cankers are perennial, often covered by shredded bark and bordered by successive callus layers. The cankers reduce the quality and marketability of the wood, and the girdling effect of multiple coalescing cankers eventually kills the host tree.

While its spread to adjacent trees is understood, just how the fungus travels long distances to find new hosts remains a mystery. Several beetle species have been found on infected trees carrying fungal spores, but it is not known which species (if any) carry spores over long distances. The fungus has also been found on the fruits of butternut and black walnut, causing lesions on the husks of both species, which means that the movement of seeds can also spread the disease.

Aside from basic practices that promote tree health, little can be done to control the spread of butternut canker disease. Those trees of good vigor and in a competitive crown position may be better able to delay mortality due to canker infection, but there is currently no practical method for preventing butternut canker infection of forest trees, and the disease is ultimately fatal.

References and additional information on butternut canker can be found at:

- [www.na.fs.fed.us/spfo/pubs/howtos/ht\\_but/ht\\_but.htm](http://www.na.fs.fed.us/spfo/pubs/howtos/ht_but/ht_but.htm)
- [www.fs.fed.us/r8/foresthealth/hosf/buttcank.htm](http://www.fs.fed.us/r8/foresthealth/hosf/buttcank.htm)
- [www.extension.purdue.edu/extmedia/FNR/FNR-421-W.pdf](http://www.extension.purdue.edu/extmedia/FNR/FNR-421-W.pdf)
- [www.forestencyclopedia.net/p/p1428](http://www.forestencyclopedia.net/p/p1428)



Photo courtesy: Manfred Mielke, USDA Forest Service, Bugwood.org



*Butternut trees are being killed by a nonnative fungus that was introduced in the 1960s. The fungus creates cankers (above) that will over time kill the tree. The cankers start out small (left) but grow larger and more numerous until the tree is effectively girdled.*

Photo left courtesy: Joseph O'Brien, USDA Forest Service, Bugwood.org

### About the Author:

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# What “wood” you see at the KY Wood Expo?



**Kentucky  
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**The Real Question is...  
What Won't You?**

September 20 - 21, 2013

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# Test Your Knowledge

Submit your answers at [www.ukforestry.org](http://www.ukforestry.org) The randomly selected entry of those with the most correct answers will receive a free copy of *Identifying Kentucky's Forest Trees*.



Hint: See article on page 1.

1. The emerald ash borer (EAB) is showing up in more counties each year. In which county was the EAB found during the 2012 EAB trapping season?

- a) Jefferson
- b) Pulaski
- c) Pike
- d) Boyd

2. Woodland roads are an important asset that allow woodland owners to access, manage and protect their woodlands. The maintenance of these roads is very important; what preventative step can be taken to help roads dry out faster?

- a) Paving
- b) Daylighting
- c) Limiting animal traffic



Hint: See article on page 10.

3. Given that parts of Kentucky are under an emerald ash borer quarantine, what are the current recommendations for dealing with immature ash on your woodland?

- a) Allow them to grow but don't invest time or efforts in helping them grow better
- b) Perform crop tree management techniques to aid their growth
- c) Harvest them



Hint: See article on page 4.

4. The Kentucky Woodland Owners Annual meeting will be held on April 9-10 and is open to everyone. Which Kentucky state park will be hosting the event?

- a) Jenny Wiley
- b) Blue Licks
- c) Kentucky Dam
- d) Natural Bridge

Hint: See article on page 9.



5. The hemlock woolly adelgid is a serious threat to Kentucky's hemlocks. Cultural, chemical (ex. insecticides), and biological controls are currently being used to combat this threat. Which treatment is currently the most effective?

Hint: See article on page 14.

- a) Cultural
- b) Chemical
- c) Biological

Scan this code with your smartphone or tablet device to submit your answers.



## ***Economic Impact of Kentucky's Forest and Wood Industry***

Photo courtesy: Renee Williams

The University of Kentucky College of Agriculture Departments of Forestry and Agricultural Economics have conducted an economic impact study of Kentucky's forest and wood industry. "Woodland owners and forest industries provided Kentucky with a significant source of revenue. When spent throughout the economy it created nearly \$10 billion in total economic impact. Since timber is grown in every county, and wood industries exist in 109 counties, the forestry sector is important to both rural and urban economies. This revenue is also important to those agencies, industries, organizations and landowners who comprise the forestry sector," said Dr. Jeff Stringer who is one of the authors of the study. The complete study will be released in early 2013.



Dr. Jeff Stringer presenting the findings from the Economic Impact of Kentucky's Forest and Wood Industry at the Kentucky Farm Bureau annual meeting.

Statewide averages show Kentucky's forests are growing twice as much volume than is being harvested or lost to mortality annually. Timber prices of many species continue to fluctuate with some markets starting to stabilize, including the pulpwood, railroad tie and the stave markets.

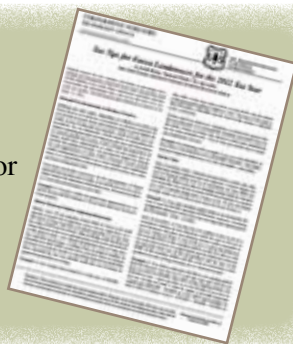
The study included an input-output analysis of Kentucky's forest products industry using Impact Analysis for Planning (IMPLAN®). Additional data was analyzed from a variety of government sources including the U.S. Forest Service's Forest Inventory and Analysis (FIA), Timber Product Output (TPO) programs and the Division of Forestry's Growing Gold quarterly marketing report.

### ***Kentucky's forest and wood industries economic impact in 2012:***

- Contribute \$9.992 billion to the state's economy in 2012 including \$6.357 billion in direct impact.
- Provide 51,928 jobs (2.7 percent of Kentucky's total employment) with 24,262 directly employed by the wood/paper and logging industries.
- Provide employment opportunities in 109 of the 120 counties.
- Provide \$1.25 billion in wages in 2012.
- Rank in the top three nationally in hard wood production and are ranked first in the South for sawlog and veneer production.

### ***Woodland Owner Tax Tips for 2012***

Check out the latest Tax Tips for woodland owners available at [www.ukforestry.org](http://www.ukforestry.org)



### ***Upcoming Dates To Remember:***

Date:	Event:	Location:	Contact:
March 23, 2013	Ohio River Valley Woodland and Wildlife Workshop	Clifty Inn, Madison, IN	<a href="http://tristatewoods.org">tristatewoods.org</a>
April 2-4, 2013	3 <sup>rd</sup> Conference on Invasion Biology, Ecology, and Management	Lexington, KY	859.257.3780
April 3-5, 2013	KFIA Annual Meeting	Lexington, KY	502.695.3979
April 9-10, 2013	KWOA Annual Meeting	Blue Licks State Resort Park	606.876.3423
Sept. 20-21, 2013	Kentucky Wood Expo	Lexington, KY	502.695.3979



# NEWS TO USE

## *Saga on Forest Road Permitting Continues...*

Recently, the U.S. Supreme Court heard a case involving logging roads that challenged their exemption from storm water permitting. Up to this time the EPA has a rule that exempts silvicultural activities (including logging) from having to have a storm water permit. Several years ago an environmental group in the Pacific Northwest took Oregon's state forestry agency and forest industry to court alleging that logging roads should be viewed as an industrial activity and not allowed to be part of the silvicultural exemption. The courts findings indicated that logging roads should be classified as an industrial activity and as such the EPA would have to require storm water permits for logging roads. If upheld by the Supreme Court logging operations in the Pacific Northwest would have to deal with permitting. Further, environmental organizations in all other regions of the U.S. would follow suit and litigate logging road exemptions. To-date EPA has indicated that they have not wanted to require logging, including the building of logging roads, to obtain permits. The U.S. Supreme Court heard the case on December 3, 2012 and will rule within the next several months. However, the EPA threw a wrench in the cog when one business day before they issued a new ruling regarding this case. Everyone believes that the new

ruling did not change anything significantly, i.e. the EPA still does not believe that logging roads are an industrial activity. However, the fact that EPA came out with a new ruling did not give anyone time, including the Justices, to review it before the hearing. Due to this anomaly it may be a possibility that the Court throws this issue back the Ninth Circuit. Christopher Reeves, Extension Forestry Associate with the Department of Forestry at UK, was at the Supreme Court for the hearing as well as present for debriefing with forestry policy makers. Most of these influential individuals indicated that regardless of the outcome there is a very good possibility that there will be continued litigation around this issue. For more background on this check out the UK Forestry Extension blog archive at <http://ukforestryextension.blogspot.com>



*A forest road in eastern Kentucky.*

Photo courtesy: Kentucky Department of Natural Resources

## *Kentucky's State Forests Attain Tree Farm Certification*

Ten state forest properties owned by the Kentucky Division of Forestry (KDF) or jointly-owned by KDF and the Kentucky Department of Fish and Wildlife Resources were recently awarded American Tree Farm certification through the Center for Forest and Wood Certification's Independently Managed Group. The properties – totaling 43,327 acres – are owned and managed for the purpose of recreation, wildlife management, timber production, and demonstration of sound forest management methods.

“Tree Farm certification recognizes that our state forests are well-managed and our work on state forests is verified by independent third party auditors,” said Leah MacS-

words, director of KDF. “The certification of Kentucky's state forests with the Center for Forest and Wood Certification's American Tree Farm System group indicates KDF's commitment to sustainable management of the Commonwealth's forests,” said Dr. Jeff Stringer, UK forestry specialist and director of operations at the Center for Forest and Wood Certification. “While certainly the division has undertaken excellent management of our state forests for some time, the third party certification that it has recently undergone acknowledges this fact.” For more information about forest certification visit <http://forestcertificationcenter.org/>



Answers from  
KWM Vol. 7 Issue 1

1. c) 4. d)
2. b) 5. c)
3. d) 6. a)



## Test Your Knowledge Review

Congratulations to J. Woolridge of Marion County. He was randomly chosen from the entries from the last quiz. Thank you Kentucky Woodland Owners Association for donating \$50 gift certificates for Test Your Knowledge.



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