



Kentucky

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Woodlands

Magazine

American Chestnut: Past, Present, and Future
Black Bears in Kentucky
Improving Woodland Wildlife

Kentucky Woodlands Magazine

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

Kentucky Woodlands Magazine
Volume 2 Issue 3

From the Editors of Kentucky Woodlands Magazine:

This issue of the Kentucky Woodlands Magazine is focused on wildlife, conservation, and natural areas including exciting new information on the resurgence of black bears in Kentucky by Dr. David Maehr, a leading authority on the conservation of large mammals in the US. This issue also contains articles on how to improve your woodlands for a range of game and non-game wildlife species and tells how to recognize and manage a glade; a special, valuable, and truly interesting ecosystem habitat that might be on your property right now and you don't even know it. A conservation topic that has garnered significant attention from woodland owners is the reintroduction of American chestnut and the current status of the effort is highlighted in this issue.

This issue of the magazine also corresponds with the onset of our fall wildfire seasons and we have provided technical information on fire science that allows everyone to better understand the dynamics of wildfires in Kentucky. Also included in this issue are many of our normal themes including woodland health, big tree champions, Forestry 101 with beginner's information on GPS, and the third installment of Dr. Deborah Hills' series on Agroforestry, focusing on riparian buffers and on woodland happenings throughout Kentucky.

We hope this issue provides you with insightful and useful information and please contact us with any comments that will help us improve the Kentucky Woodlands Magazine.

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About the Cover: John Cox, UK Department of Forestry Adjunct Assistant Professor of Conservation Biology and Griffith Woods Research Coordinator and Site Manager, contributed the cover photo of a blue ash at sunrise at Griffith Woods in Harrison County. Griffith Woods contains the largest known remnant of bluegrass savanna-woodland that covered much of the region before European settlement. Dominant species include blue ash, white ash, chinquapin oak, bur oak, hickories, black walnut, American elm, and Kentucky coffeetree. Many of the trees are more than 300 years old. In fact, the world's largest chinquapin oak is found at Griffith Woods. For more information about Griffith Woods visit <http://www.friendsofgriffithwoods.org> or contact John at 859-257-9507.

Photo above courtesy: Billy Thomas

Back cover photo courtesy: Kentucky Division of Forestry



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By Michael French

Redwoods of the East

The forests of eastern North America were once home to American chestnut (*Castanea dentata*), formerly an extremely important tree for timber, tannin production, and wildlife. Chestnuts once composed approximately 20 percent of the canopy cover throughout the eastern forests, ranging from Maine south to Georgia and Alabama and west to the Mississippi River. The massive hardwoods were known as “redwoods of the east” and averaged five feet in diameter, attaining heights of more than 100 feet. The largest recorded specimen was found in Francis Cove, North Carolina, and was an incredible 17 feet in diameter. The trees grew quickly and produced a versatile wood that is lightweight, straight grained, easily worked, and rot resistant, even when in contact with the soil. These characteristics made it valuable for building construction, telephone poles, railroad ties, fence posts, and even fine furniture and musical instruments. The wood was so useful that it has been referred to as a “cradle to the grave” species because one’s crib and casket might both have been made from chestnut.

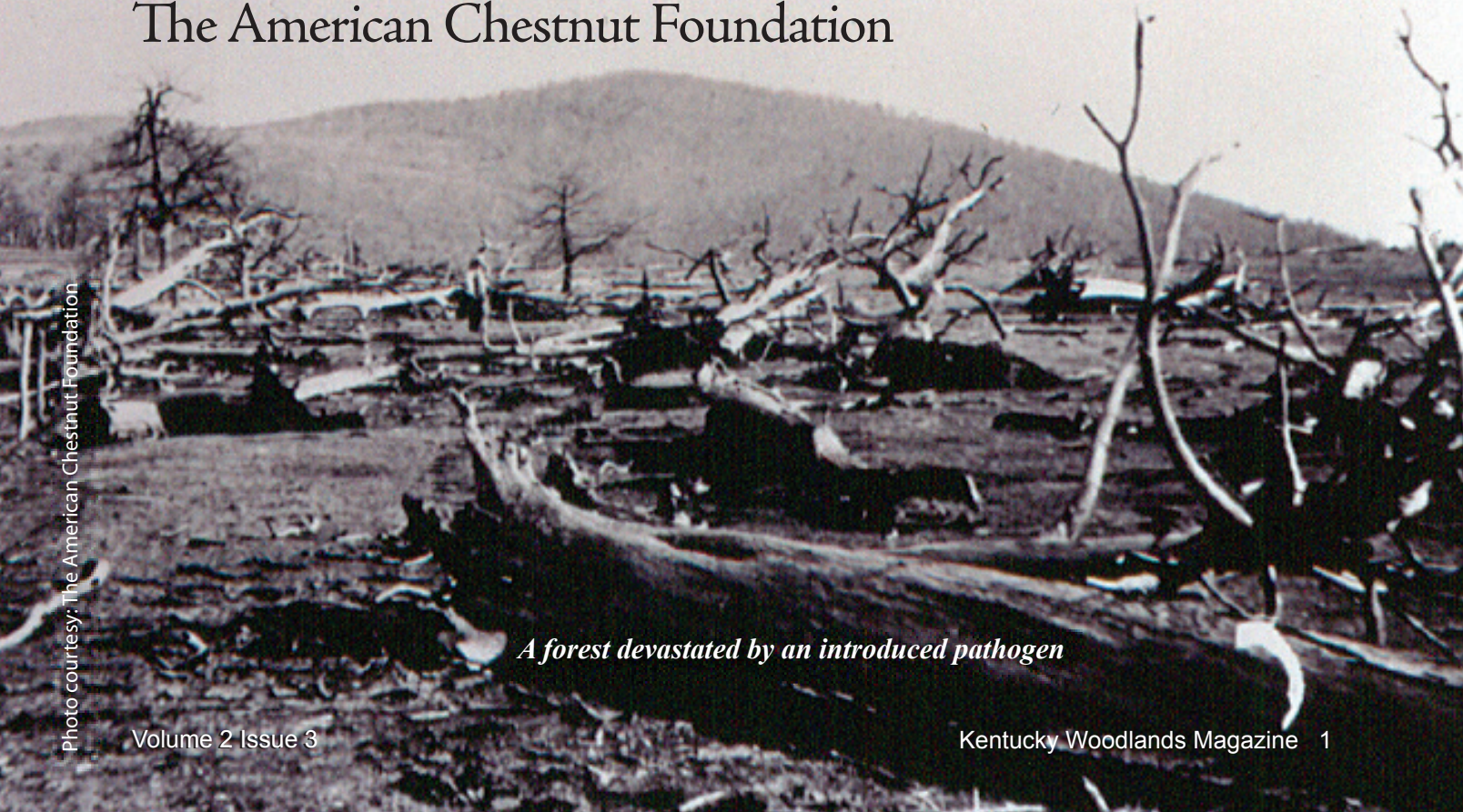
Chestnuts also produce a small, sweet nut, and their production was unrivaled. Unlike other nut producers such as oaks and beech, which flower early and vary in production from year to year, chestnuts bloomed in early-to-mid



summer, which protected the flowers from late frosts, so every fall they produced a reliable, abundant nut crop that was consumed by deer, turkeys, grouse, bears, small mammals, livestock, and humans. Railroad cars were loaded with bushels of nuts which were shipped to cities and sold freshly roasted to pedestrians. Attics throughout Appalachia would be filled with nuts for cooking and eating

Restoring an American Classic:

Progress of the Kentucky Chapter of The American Chestnut Foundation



A forest devastated by an introduced pathogen

throughout the winter. Nearly everyone has heard of chestnuts roasting on an open fire, although few today are able to truly enjoy them.

In 1904, a forester at the New York Zoological Park reported an unknown fungus killing chestnuts. The chestnut blight, as it came to be known, was likely introduced by the importation of infected Japanese chestnuts (*Castanea crenata*). The disease was spread by wind, insects, and animals, including humans, and traveled approximately 50 miles each year, leaving destroyed forests in its wake. The disease attacks the vascular tissues of the trees through wounds in the bark, rapidly girdling the tree and cutting off circulation above the infection. By the 1950s, it had covered the entire range, approximately 4 billion trees had perished, and we had lost an important timber and wildlife tree. Many consider the demise of the American chestnut to be the greatest ecological disaster of the 20th century.

The American Chestnut Foundation—There's Hope

Since 1983, the goal of The American Chestnut Foundation (TACF) has been to restore this respected tree to its rightful

position as a dominant tree throughout its natural range. Fortunately, chestnuts have the ability to sprout from the stump, and although few survive to reach the flowering stage, TACF is selectively breeding chestnuts to develop a tree that has a high degree of resistance to the blight and will be able to thrive and reproduce independently in a forest setting. By conducting controlled pollinations through a series of crosses, backcrosses, and intercrosses, TACF is producing backcross chestnuts that incorporate Asiatic chestnuts' blight resistance while retaining the desirable timber- and nut-producing characteristics of the American chestnut (Figure 1). Essentially, TACF would like to breed all Asian chestnut characteristics out of its backcross trees, with the exception of blight resistance. Each family line within a generation is selected for blight resistance by inoculating the trees with strains of the blight fungus and using only those that show good disease resistance during successive stages of crossing. In this manner, TACF is currently producing trees that are approximately 15/16 American chestnut in characteristic and 1/16 Chinese chestnut. TACF produced the first of its "final" product in 2005 and hopes to begin widespread testing around 2010.



Photo courtesy: TACF

Loggers take a break to pose for a picture inside an enormous American chestnut.

THE AMERICAN CHESTNUT FOUNDATION'S BACKCROSS BREEDING PROGRAM

With each cross, additional American chestnut characteristics are regained. Only at the final cross, however, is blight resistance equal to that of the Chinese parent again reintroduced.

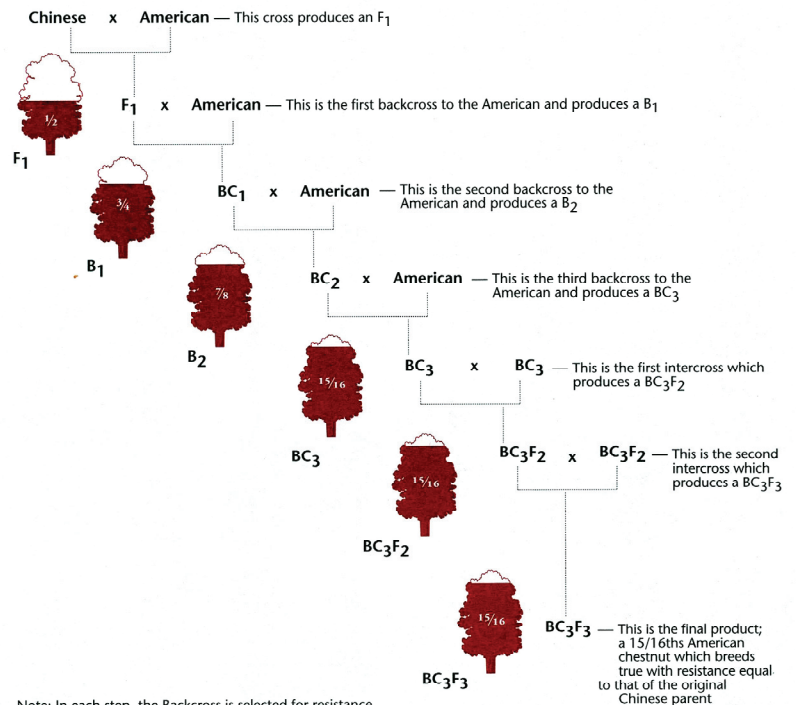


Figure 1. The American Chestnut Foundation's breeding strategy

Kentucky Division of Forestry employees help pollinate the state champion American chestnut in Adair County.



Photo courtesy: Michael French

Chestnuts in Kentucky

Chestnuts, which prefer rich, slightly acidic, well-drained soils, were found across Kentucky. They were most abundant along Pine Mountain and the Cumberland Plateau region, and the standing skeletons of long dead trees can still be found on the ridges. Sprouts are also abundant throughout these regions, but they persist in the understory and rarely reach reproductive maturity. Chestnuts dominated the ridge tops, often forming pure stands of many acres, and old-timers tell stories of how the ridges appeared to be covered with snow in June, due to all of the chestnut blooms. Chestnuts generally do not fare well in limestone soils and soils with high water-holding capacity and clay content, and they were rare or absent in the Bluegrass and Western Coalfields regions.

TACF is organized by state chapters, and in 2001, Kentucky formed a chapter following the discovery of a large surviving American chestnut in Adair County. By applying a pollen that is 7/8 American in character to the tree, the Kentucky chapter produced its first 15/16 family line. The minimum goal of each state is to produce 20 of these family lines, although the chapter would like to capture many more so that we preserve as much genetic diversity as possible. The offspring of each surviving American chestnut pollinated with a 7/8 pollen constitutes a family line, so it requires at least 20 flowering trees to reach our goal. The Kentucky chapter currently has completed or is working on 17 of these family lines including trees from as far west as Marshall County and as far east as Pike County.

The Kentucky chapter will continue to search for flowering trees across the state to include in its breeding strategy. Several survivors were discovered this past year and were immediately put into the breeding program. A few of the family lines will not be followed, due to seedling losses, mother tree death, or both, so the chapter must replace these lines with those from other naturally occurring survivors. We have also established breeding orchards in six counties so that we can grow the seedlings and screen them for levels of blight resistance and growth characteristics, and we will establish more as we produce more family lines.

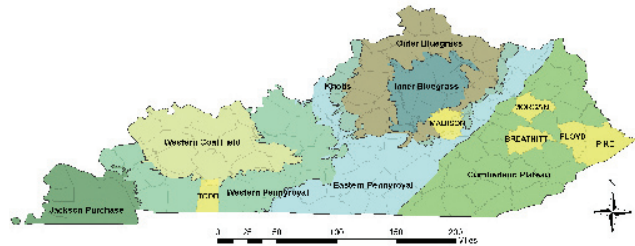
We have recently begun to experiment with mother tree orchards. Created from existing sprouts, these orchards have been successful in other states. The sprouts are flagged during the summer, then dug up and transplanted to another location during dormancy. A map of the orchard will then be created so that we will know where each sprout came from. In doing this, we will be able to care for them until they reach the flowering stage. This will save us time and travel expenses during the pollination season, and later their blight-resistant offspring can be planted in the region from which the parents were dug.

For more information about American chestnut restoration, please visit our Web site at: www.acf.org.

Author:

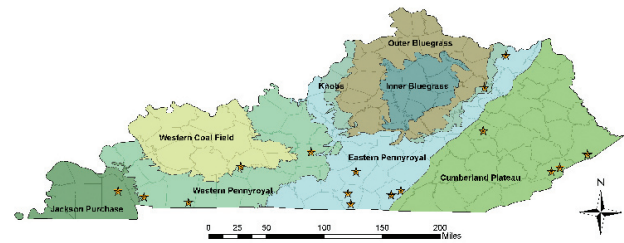
Michael French is a graduate student in the Department of Forestry at the University of Kentucky working on linking American chestnut restoration to mine land reclamation. He is also the vice president of the Kentucky Chapter of The American Chestnut Foundation.

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Locations of Kentucky's breeding orchards by physiographic region and county

Maps courtesy: Michael French



Locations of Kentucky's mother trees by physiographic region and county

Rob Watts, forest manager of Lilley Cornett Woods, examines a cankered tree with basal sprouts.



Photo courtesy: Michael French

Black Bear Ecology and Colonization in Eastern Kentucky

By David S. Maehr

When Daniel Boone led settlers through the Cumberland Gap in 1775, the black bear outnumbered white-tailed deer, elk, and every other large mammal in eastern Kentucky's forests. By the 1850s, it was gone. Today, the black bear is once again a part of Pine Mountain, Cumberland Gap, and the regenerating forests of the state's mountainous region. With widespread forest clearing and unmitigated harvest now a thing of the past, Kentucky is once again an attractive place to live for an increasing number of bears. Our radio telemetry study, funded by the Kentucky Department of Fish and Wildlife Resources, began in 2002. Since then my graduate students and I have captured and radio-collared 79 black bears and have collected thousands of locations on these animals. Some of the bears wear global positioning system (GPS) collars that collect up to 24 locations each day. These data have been useful in identifying key habitats, population centers, and travelways. For the most part, study animals inhabit mixed deciduous hardwood forests growing on steep slopes and at relatively high elevation. The primary population centers identified thus far include Pine Mountain in the vicinity of Kingdom Come State Park and the area around Cumberland Gap National Historic Park. Bears are also found in and around Big South Fork National Recreation Area in McCreary County following introductions of Tennessee bears in the mid-1990s. Another collaboration with Indiana University of Pennsylvania used hair-snaring devices to census other areas where access for trapping and collaring is more difficult. This work, which relies on genetic analyses of hair samples collected at bait sites, will help us estimate population numbers and better understand the current distribution of the growing bear population.

Another element of our research involves Forward-Looking Infrared Radiography (FLIR) cameras to document the distribution and abundance of bears during a brief period when leaves have fallen from trees but before the bears disappear into winter dens (hibernacula). Hannah Harris's dissertation work detailed the attitudes of local human residents who live in Kentucky bear range. She found an interesting relationship between the local communities and bears that is supportive of the bear yet ambivalent about official efforts to manage the population and its wild habitat. Already, bears are a focal point of activity for summer visitors to Kingdom Come State Park where they are routinely seen in and around picnic areas. This situation has created challenges for managers of natural resources

Photos courtesy, John Cox



who must balance the interest of the public with the welfare of individual bears and their growing population. Sadly, a fed bear often winds up as a dead bear.

The black bear in Kentucky lives much like its relatives in neighboring Appalachian states. Most females choose small caves and rock outcrops for den sites. These are usually cozy, secluded spots near cliff lines and other rugged topography. They emerge from their dens in late spring, mate during the summer, and feast on acorns, insects, and hickory nuts in the fall—putting on fat for up to five months of hibernating. During this time—usually early February—the cubs are born. We have documented litters ranging in size from two to five. Clearly, nutrition does not seem to be a problem for this population, and we have had several females that have exceeded 200 pounds. Female bears tend to be older than males—likely a function of the wider movements of males and their tendency to encounter highways and people more often than females who are often accompanied by small cubs. As elsewhere, males are larger than females. A large male will exceed 400 pounds. Of more interest and concern is how and if the population will continue to grow and colonize vacant range. Right now, most resident adults live along Pine Mountain, with home ranges that follow the topography of this distinct geological formation. We believe that there is lots of good habitat to the west, but few if any females live west of Pine Mountain. Will a black bear population once again inhabit the forests of the Daniel Boone National Forest? Only time will tell. Ongoing studies will seek to understand the influence of roads, towns, mining, and other human activities on the westward expansion of the Kentucky black bear.

In the meantime, our research operates throughout the year: tracking collared animals by aircraft, downloading GPS data via satellite, capturing bears throughout the summer, and visiting maternal dens during the winter. Although bears hibernate during the winter, we do some of our most exciting work during this season. Dave Unger's dissertation work demonstrated that Kentucky black bears are producing lots of cubs; the average litter size of 3.1 is more than any other nearby population. Annual home ranges are nearly 10,000 acres for females and almost 100,000 acres for males. They prefer forests with plenty of oaks and seem to travel parallel to Pine Mountain and other ridge lines.

Black bears are primarily vegetarian, but bears will eat pet food, garbage, and other human-made food sources if people are not careful. These situations have led to irate homeowners, shootings, and dead bears. Getting along with bears is not difficult so long as we don't store food and wastes haphazardly. When asked what to do when you encounter a bear, I say to enjoy the opportunity by watching quietly and making room for the animal to pass. Attacks are extremely rare and can be virtually eliminated if hikers and other wilderness recreationists travel in groups.

Author:

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Dave is a Conservation Biology professor at the University of Kentucky Department of Forestry. In addition to teaching and working with numerous graduate students, he conducts research on elk restoration, black bear recolonization and conservation, and neotropical migrant warbler ecology and conservation in Kentucky.

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Black bear researchers at the opening of a den in Eastern Kentucky.





Whitebreasted
Nuthatch

Photo courtesy: John Cox

Improving Woodland Wildlife Habitat

*Adapted from:
Forest Landowner
Magazine 66(2):30-31.*

By Jeff Stringer and Thomas Barnes

In Kentucky, most woodland owners appreciate and enjoy viewing or hunting wildlife and devote some time, energy, and resources to managing or improving habitat on their land. While most management may be concentrated on the open areas or fields in or near their woodlands, landowners should be aware that there are a number of simple practices that can be used in hardwood stands to create habitat for both game and non-game wildlife. Careful management of hardwood stands with an eye to wildlife habitat needs can be compatible with many ownership objectives, including timber production. Some species, like ruffed grouse or woodcock, require specific management strategies to

provide habitat to meet some of their habitat requirements. Prior to undertaking any woodland management, especially if you are planning a timber harvest, make sure you understand how to balance your wildlife objectives with your other objectives. For example, removing all the trees in a stand can be beneficial for ruffed grouse and white-tailed deer, but it is not necessarily beneficial for wild turkeys or squirrels.

In Kentucky, assistance can be obtained from wildlife biologists with the Kentucky Department of Fish and Wildlife Resources. Also service foresters with the Kentucky Division of Forestry commonly call on wildlife biologists to assist with the development of a stewardship plan that incorporates wildlife objectives. Plans and planning assistance from either of these agencies is free. Some practices you can accomplish yourself without a large financial investment. Some practices, or your individual situation, may require assistance. Cost-share money may be available to help offset the cost of wildlife habitat improvement activities, and your wildlife biologist or service forester will know about the availability of funds. Wildlife habitat improvement can also be accomplished as part of a timber harvest, and professionals can help you with incorporating wildlife objectives into the harvest.

The following provides several reasonable alternatives to help improve wildlife habitat in hardwood stands throughout Kentucky. Contact

a wildlife biologist or service forester to help assist you in assessing your property for the use of these techniques.

Improving Mast Production

Some woodland-dwelling wildlife populations, including white-tailed deer, wild turkey, squirrels, and black bear, can be linked to hard mast production, and in years with abundant acorns, they do quite well. Technically, the term mast refers to fruits from trees and shrubs. We typically think of a fruit as something that has a fleshy outside surrounding a seed, such as a cherry. However, in the case of woodland trees and shrubs, fruits include acorns, nuts, and berries, as well as what we commonly refer to as a fruit. Table 1 provides a list of common hard (acorns and nuts) and soft mast (fruits and berries) that occur in a typical hardwood stand. The nuts of various species like oaks, hickories, beech, and walnuts are readily eaten by wildlife, but in some cases the trees may not produce nuts on a consistent basis or nut production has been lost altogether. You can improve this by focusing some timber management on identifying those specific trees that have the capability to produce large mast crops. In the case of oaks, research has shown that often only a few individual trees in a stand contribute to the majority of the acorn production. Also, good acorn producers cannot always be determined by the size of the tree. *Figure 1* shows data from a four-year experiment conducted by the authors. The data points show the average four-year acorn yield from individual woods-grown white oak trees. Notice that some smaller trees produce a large number of acorns and not all large trees produce abundantly.

Proper mast management means that you need to keep a variety of mast species including hard (oaks, beech, and hickory) and soft (black cherry, dogwood, and persimmon) mast species as well as improving the production of key species if required. This variety helps to ensure more consistent

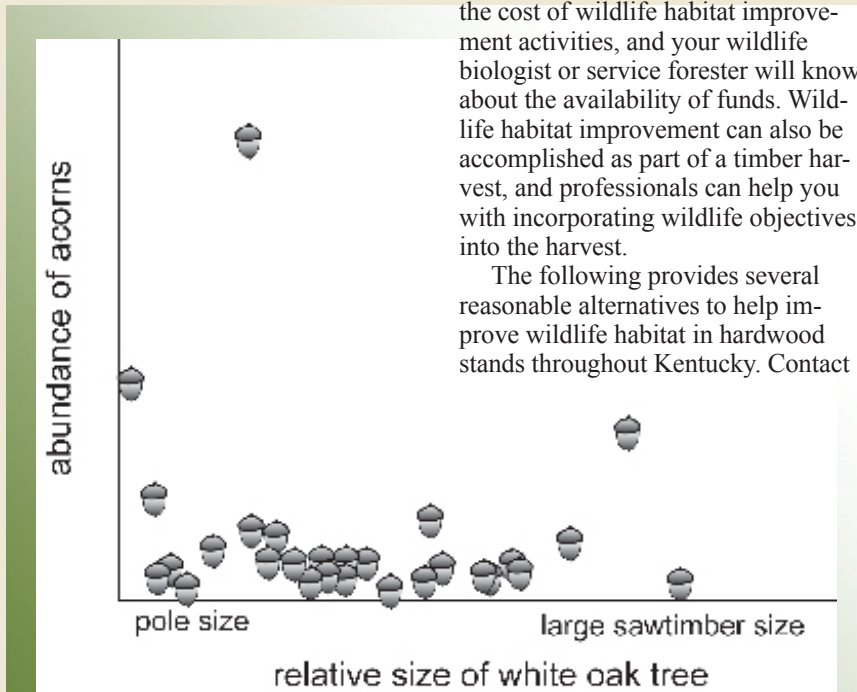


Figure 1. Relative amount of acorns for individual white oak trees.

seasonal and year-to-year mast production. Also, scout for and retain some vines that provide soft mast such as wild grape, Virginia creeper, and poison ivy. Some of the soft mast species like wild grape can cause problems with timber development, especially on highly productive sites when they are regenerated. However, grape is a valuable wildlife food, and most foresters recognize the need to keep a moderate amount of grape in a stand. If the abundance of grape is seen as a problem for future woodlands regeneration, some grape can be controlled to ensure that it does not overrun a regenerating stand.

To maintain high levels of hard mast, particularly oaks, scout the woods for trees that have abundant acorn crops. Remember that oaks, like many tree species, vary from year to year in their production of nuts. After those good trees have been identified, mark them, and make sure they have plenty of room to grow and flourish. One of the best methods for ensuring their vigorous growth is to use a crown touching release. This is accomplished by removing neighboring trees whose crowns are touching or competing with the crown of your mast tree. You might also remem-

ber that during the marking phase, it is always good to have a mixture of both red and white oak species because white oak acorns are preferred over red oak acorns, but some red oak species, such as scarlet or pin oak, produce acorns on a more consistent basis.

Creating Wildlife Openings

Openings in woodlands that are large enough to provide for the establishment of a new age class can provide significant browse (Figure 2). You can create these openings yourself or they can easily be established using a timber harvest. As these areas rapidly regenerate, they

continued on page 8

Table 1. Preferred native hard and soft mast species for wildlife management in hardwood forests.

Hard Mast Species	
oaks – white oak	White oak is highly preferred due to its palatability and medium size.
oaks – red and white	Mix white and red oak species, especially those with small to medium size acorns. Mixing species helps ensure consistent year-to-year production. Species with especially large acorns, such as bur oak and overcup oak, are less preferred by a range of species.
American beech hickory, pecan black walnut	Consistent producer of relatively large mast crops. Squirrels love the nuts. Both hickories and pecans provide abundant mast. Preferred by squirrels, Limited use by other game species.
Soft Mast Species	
wild grape dogwood, serviceberry black cherry persimmon berries – black, raspberry	Preferred food for a large number of species. Flowering and fruit production are increased when trees are located on edges of openings Used by songbirds. Highly preferred by a large number of game and non-game species. Edge and early successional foods preferred by a large number of species, Typically can be found in regenerating openings in uplands for the first three to four years.
vines, poison ivy, Virginia creeper	Many times considered nuisances. Various species of vines do contribute to significant soft mast production. Songbirds love the berries and spread them.
blackgum, tupelo	Used by songbirds.

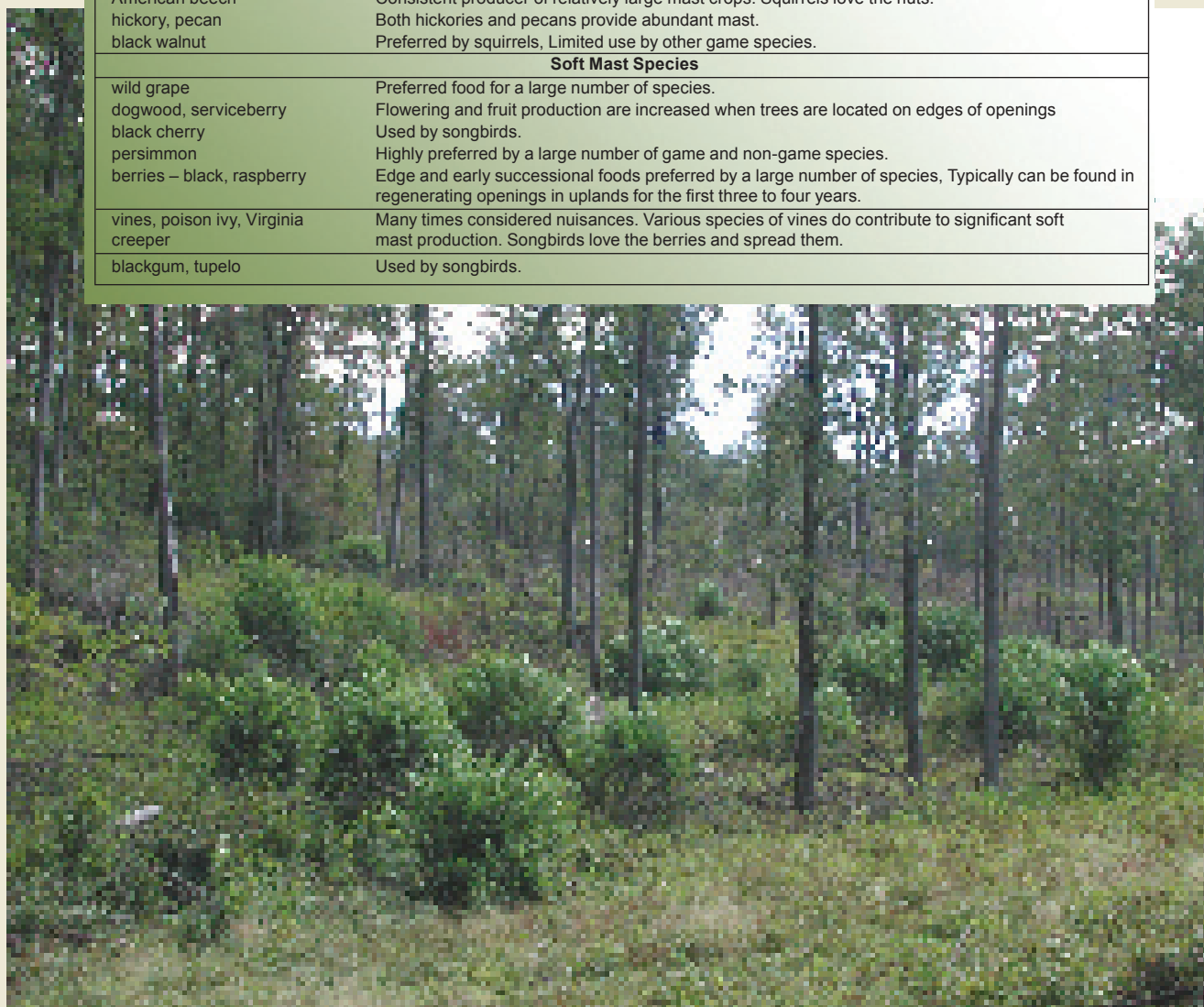


Photo courtesy: Jeff Stringer

Figure 2. Edge of opening showing abundant browse potential.



Figure 3. Snags provide significant habitat for a wide variety of game and non-game species.

Photos courtesy: Tom Barnes

Photo courtesy: John Cox

under this scenario is to allow for regeneration at the ground level but to leave important food and denning or nesting sites.

One critical issue to understand in creating regeneration openings is how and where your woodland is in the larger picture, the surrounding landscape. This is important because how big your woodland is and what the surrounding land is used for can have potentially devastating results for non-target wildlife and exotic pests. Research has shown that if you are creating openings in a large forest covering thousands of acres, the openings have little effect on area-sensitive wildlife species like some songbirds. However, if you have a small woodland, surrounded by agriculture, then the results can be devastating because blue jays, rat snakes, raccoons, and other nest predators can easily find these nests. Furthermore, brown-headed cowbirds can easily find the nests of other songbirds and lay their eggs in the nest. Their young grow faster, get more food, and outcompete the other songbirds, resulting in a net decrease in that species. Finally, openings in woodlands in highly fragmented environments are susceptible to invasion by alien or exotic plants. Tree species such as tree-of-heaven or royal paulownia, vines like oriental bittersweet or Japanese honeysuckle, grasses like Chinese silver grass or Japanese stilt grass, and a host of others, can invade the woods. The possibility of invasion is greatest when your woods and the subsequent openings are close to a source like farmlands, rights-of-ways, industrial areas, and other open areas. The message here is that if your hardwood woodlot is small and surrounded by land uses other than forestry, care must be taken in producing openings.

Snags

Snags (dead trees) are essential habitat for raccoons, bats, and non-game birds. Snags with insects in them are providing food for many species, and the holes excavated or occurring naturally are used as denning sites for raccoons and flying squirrels (Figure 3). In addition, the dead limbs serve as perching sites for various raptors

can also provide dense shrub and small tree habitat for 10 to 15 years before the dominant species close canopy and most of the shrubs and small trees are gone. During the initial phase of regeneration, ruffed grouse and American woodcock will use this habitat for brood rearing or feeding habitat, and non-game species like indigo buntings will find this a favorite hangout. If your primary management objective is wildlife, you will want to keep these openings relatively small, ranging from ¼ to 1 or 1½ acres in size. Openings in the range of 1 to 1½ acres also work well for the regeneration of a range species that satisfies both wildlife and timber objectives and keeps the regenerating size class growing at a rapid rate. In this type of operation, all merchantable trees should be removed, and herbicides should be used to remove all remaining trees of unwanted species down to one to two inches in diameter. Remaining trees of valuable species should be cut, but no herbicides should be applied to those stems so they can resprout and regenerate. Valuable species are those that will meet your long-term management objectives and can vary according to your objective. This treatment is called site preparation for natural regeneration. You are ensuring or preparing the site to maximize growth of the regenerating age class by removing unwanted overtopping trees. If wildlife is a primary objective, then all snags should be retained in the opening, and soft mast trees like flowering dogwood should be left standing. The goal

and other birds of prey. In some cases, snags can be created and, whenever possible, snags should be retained in timber harvests. What is important is that the remaining snags be properly spaced or evenly spread throughout the cut because many wildlife that use snags are territorial and will actively defend individual trees or a group of snags. Remember that snags do represent a danger in the woods, and care should be taken around them. It is not recommended to leave snags where they can fall on roads or trails. If you must remove some snags, the general rule is to leave the largest, relatively sound trees, especially those with cavities already in them. The minimum number left standing should be four trees greater than 6 inches dbh per acre or about 40 trees per 10 acres.

Ensuring Adequate Coarse Woody Debris

Snags don't remain standing forever, and when they come down, they are referred to as coarse woody debris. This is a technical term for rotting logs and branches, and in a well-tended and intensively managed woodland, there are few of them. The best type of debris for wildlife is large logs, and the bigger, the better. Ruffed grouse will use these for drumming sites, and other wildlife will use them to cross streams or store food. Logs also serve as habitat for some herpetofauna (for example, salamanders) and as elevated perch sites for a variety of small animals. If you are logging, you can help wildlife and deal with an aesthetic problem by having the skidder haul cutoffs from the landing back into the woods (Figure 5). This can be particularly valuable in younger hardwood stands where few rotting logs or branches have accumulated. On severe slopes, it is best to orient the logs along the contour and against stumps to minimize erosion problems. If you create slash piles from treetops, leave about 10 percent in piles or short rows to provide patch habitat.

Creating Ponds

One valuable habitat addition that can be created is a ridgetop woodland pond. Often you can create these shallow ponds yourself or if you are



Figure 5. Cutoffs and other woody debris created at a log deck can be distributed back into the woods to create coarse woody debris—the bigger, the better.



Photos courtesy: Jeff Stringer

undertaking a timber harvest logging equipment can be used. These ponds help distribute wildlife more evenly in the environment as most water is usually located at the base of the hills or mountains. In addition, these water sources serve as important breeding grounds for frogs, toads, and salamanders, and you can even get a wood duck or two if they are large enough. Wildlife biologists can be particularly helpful with designing and placing woodland ponds.

Soft Edge

One final consideration is the development of soft edge. If you are interested in quail and have some quail habitat adjacent to the woodland, you can feather the edge by removing 75 percent of the canopy for 50 feet from the edge, removing 50 percent for the next 50 feet, and removing 25 percent for the next 50 feet and allowing the woodland to regenerate naturally. This creates an environment with varying amounts of sunlight hitting the forest floor, and many briars and bushes will grow and provide a transition zone for wildlife.

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Thomas Barnes, Ph.D

Tom is an Extension Professor and Extension Specialist with the University of Kentucky Department of Forestry.

Figure 4. Snags can be created using individual tree injection, hack and squirt, or girdling.



Photo courtesy: Jeff Stringer

His specialties are wildlife ecology, biodiversity, wildlife management, and ecosystems management.

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Forest Health



Invasive Plant Hit List: Kudzu

By Mitch Blair

Kudzu (*Pueraria lobata* Willd.) is a leguminous vine native to China. The plant was first introduced to the United States in the late 1800s as an ornamental and later grown as a forage crop and soil stabilizer. Kudzu now grows throughout the southeastern United States, including Kentucky, and occurs in a variety of sites, such as forest edges, rights-of-way, old homesteads, and stream banks. Capable of growing two inches a day under optimal conditions, kudzu is considered an invasive species due to its growth habit and ability to dominate a site if left unchecked.

Identification and Reproduction

Kudzu is an aggressive, climbing, or trailing herbaceous to semi-woody, deciduous, perennial

Kudzu leaf



vine. Leaves are alternate pinnately compound with three leaflets that are three to four inches long. Leaflets are attached to a long petiole, and both the leaflets and petiole are covered with bronze

hairs. Leaf characteristics remain the same with age, except for leaf size, which increases as the plant matures. Tender shoots and stems become semi-woody to woody with age. Mature vines may grow up to ten inches in diameter and show little to no branching. The vines can climb almost any type of structure measuring less than six to eight inches in breadth or diameter. Flowers develop from June to September and are lavender with yellow centers.

Kudzu plants have an extensive root system with large tuberous roots that may reach three to ten feet in depth. Sprouting from adventitious roots and tubers is more problematic and common in Kentucky than germination from seed. Reproduction by sprouting is often aggressive and can result in dense monoculture mats that are difficult to manage. Root sprouts emerge each year between late spring and early summer. Kudzu is extremely susceptible to frost, and the aboveground portions die back after the first frost of the season, but the belowground portions remain viable.

Control Measures

Cultural control methods, such as livestock grazing, have been shown to be effective in controlling the size of a small ongoing infestation. Intensive grazing by goats and cattle, for example, may help deplete root reserves and weaken the plant to allow for easier control.

Mechanical control of kudzu infestations by mowing, hand removal, or prescribed burning is usually ineffective due to the inadequacy of these methods to control sprouting roots and tubers. Mowing or burning late in the growing season followed by an early application of triclopyr ester or glyphosate as a 2 percent solution in the following growing season may increase control efforts of smaller infestations.

Kudzu cannot be controlled with one herbicide application. To reduce an infestation, multiple applications are necessary over several growing seasons depending on the age of infestation. The herbicides listed in Table 1 are available for kudzu control. Foliar applications should be used at moderate high application volumes (25 to 50 gallons per acre or greater of spray solution, depending on density and size of the infestation) to thoroughly wet leaves. Basal applications can be made to climbing or trailing stems while taking precautions to avoid non-target damage.

Care should be taken when using picloram due to its water solubility and soil persistence. Use extreme caution to avoid off-target damage when using herbicides. Always follow the labeled instructions related to the application of herbicides and related personal protective equipment. Consult the label and your local county Cooperative Extension office to determine which products will best suit the site characteristics.

Foliar application on kudzu



Photo courtesy: Mitch Blair

Kudzu

Kentucky Forest Health Task Force

Table 1. Common herbicides available for kudzu control.¹

Active Ingredient(s)	Herbicide(s)	Rate of Product	Comments
Glyphosate	Roundup, Accord, etc. ²	4 qt/acre or 2% solution	Apply at 50 GPA ³ or greater spray volume, or spray to runoff in mid- to late summer. Apply with nonionic surfactant at 0.5% v/v ⁴ .
Metsulfuron methyl	Escort	3-4 oz product/ acre	Apply at 25-50 GPA or greater spray volume, or spray to runoff in mid- to late summer. Add a nonionic surfactant at 0.5% v/v.
Clopyralid	Transline	0.25-1.3 pints/acre	Apply up to 100 GPA spray volume, or spray to runoff in mid- to late summer before kudzu flowers to ensure sufficient coverage. Include a nonionic surfactant at 0.5% v/v.
Triclopyr ester	Garlon 4	20% with oil carrier for basal spray or 4-8 qt/ acre for broadcast foliar	Apply as a basal spray Jan.-Apr. to vines 2" or less in diameter. Apply as a foliar spray using water at 25-50 GPA or greater spray volume, or spray to runoff in mid- to late summer. Include a nonionic surfactant at 0.5% v/v when using foliar treatment.
Triclopyr amine	Garlon 3A	0.25 to 3 gallons/acre	Apply at 25-50 GPA or greater spray volume, or spray to runoff in mid- to late summer. Add a nonionic surfactant at 0.5% v/v.
Dicamba	Vanquish	8-64 oz/acre	Apply at 25-50 GPA or greater spray volume, or spray to runoff in mid- to late summer. Add a nonionic surfactant at 0.5% v/v.
Picloram + 2,4-D	Tordon 101M	1-2 gallons/acre	Apply at 25-50 GPA or greater spray volume, or spray to runoff in mid- to late summer. Add a nonionic surfactant at 0.5% v/v.

¹ There are other herbicide brands available for kudzu control. The herbicides listed above are those that have widespread use.

² There are a large number of brand names for glyphosate herbicides. Many are for use in fields, fencerows, and other non-forestry settings. Few such as Accord are labeled for forestry use (see the July 2006 issue of Kentucky Woodlands Magazine for more information on glyphosate herbicides).

³ GPA = gallons per acre.

⁴ v/v = an abbreviation for 'by volume'. Thus 0.05% v/v means that the volume of the substance is 0.05% of the total volume of the solution or mixture.

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Photo courtesy: Jerry Asher, USDI Bureau of Land Management

www.KyForestHealth.org

Glades of Kentucky

By Thomas Barnes
and Marc Evans

Photos courtesy: Tom Barnes



Limestone slope glade



Necklace glade

A glade in the strict technical sense is an opening in the forest. However, from an ecological perspective, glades are much more than just forest openings. They are typically areas where the underlying bedrock comes to the surface or near the surface, and there are often large areas of exposed rock. These unique habitats are generally not large, an acre or two at best, and usually much smaller in size. Glades occur throughout Kentucky, but they are not common in any region and can occur on limestone, dolomite (dolomite is a type of limestone), shale, and sandstone. The true “cedar glades” of the southeastern United States, and represented only in Kentucky in Bullitt, Logan, Simpson and War-

ren counties, are dominated by a small annual grass, annual dropseed, and require no natural disturbance or management to persist. The other types of “Midwestern” glades typically require some type of periodic disturbance, such as fire, to maintain them, and they typically are dominated by a perennial grass, little bluestem.

One can only imagine what life would be like for plants in this extreme environment. The hot, dry environment is quite hostile to plant life. Most plants that grow there are xerophytes and can withstand these harsh environmental conditions. No plants grow in the harshest habitat of exposed rock except for lichens and mosses. However, on the edges or in cracks or crevices where some soil can be accumulated, you can find drought-tolerant perennials or annuals that develop and set seed prior to the onset of summer heat. Typ-

ical forbs might include widow's cross, prickly pear cactus, false aloe, three-awn grasses, narrow-leaf coneflower, and slender heliotrope. Woody plants find this type of environment difficult to grow in, and oftentimes you will find red cedar, post or blackjack oak, winged elm, fragrant sumac, or redbud eking out an existence.

Limestone glades occur mostly in the Mississippian Plateau, Outer Bluegrass, and Knobs regions of the state and are the most common type of glades in the state. These glades can occur on a steep slope or can be flat. If they are flat, unlike their cousins on slopes that have well-drained soils, these glades can be extremely wet in the winter and spring. This creates a unique environment for numerous rare plants. One flat rock or pavement glade in southern Kentucky supports populations of numerous rare plants including limestone fame flower, Butler's quillwort, necklace gladecress, stemless evening primrose, hispid false mallow, and upland privet.

Dolomitic limestone glades are very restricted in Kentucky, and they generally occur only in southern Jefferson and northern Bullitt counties. These are typically flat to rolling, and where the bedrock comes to the surface, you find the following rare plants: Kentucky glade cress, Eggelson's violet, Crawe's sedge, Northern dropseed grass, and Great Plains ladies' tresses orchids. These rock outcroppings are often associated with deeper soils where a more prairie-like environment exists, and the vegetation is dominated by warm-season grasses and forbs. The Kentucky glade cress is a globally rare plant and one of only two endemic plants in Kentucky, and its populations have declined by more than 70 percent as a direct result of habitat loss to development.



Sandstone glade

Sandstone glades occur in the Cumberland Plateau and Shawnee Hills regions. One of the more interesting things about sandstone glades is that often the rocks are covered by a thick mat of mosses and lichens. Much like the other types of rock habitat, some unusual plants occur in these environments including roundleaf fame flower, Appalachian sandwort, and June grass. Some more common species likely to be found in this habitat include blue curls, pinweed, golden aster, and false dandelion.

Shale glades are found primarily in the Knobs region where the Mississippian, Silurian, and Devonian shale is exposed. These are usually quite small and, because they have such loose texture, hardly anything grows on them with the exception of Carolina wild pink. Shale glades in surrounding states do have some unusual and rare species associated with them.

As a private landowner, what should you do if you suspect you have a glade on your property? The first thing to do is to contact a qualified botanist. It takes a trained eye and experience to identify rare plants that might be growing in your glade. If you have a forester or wildlife biologist working with you on your property have them assist you with finding a botanist or contact the State Nature Preserves Commission www.naturepreserves.ky.gov for help. Once a botanist has made this determination, your management options can vary depending on the type of glade. For instance, most flat rock, shale, and sandstone glades need nothing more than perhaps some occasional timber management around the perimeter or the removal of some exotic species. If you have a limestone slope glade, the prescription might be an occasional burn with some selective timber removal to open the area up and to reduce future problems with tree invasion on the glade. There is even money available today to assist you in managing these unique habitat types. Contact the Kentucky State Nature Preserves Commission for more information about this program.



Limestone flower-of-an-hour

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Forestry 101

GPS in Forestry

By Doug McLaren

The newest acronym to come into the forestry tool box of terms during recent years is GPS (Global Positioning System). This newest technology has provided forestland managers a time-saving device when completing forest surveys of all types. GPS technology is based on 24 satellites that are located some 12,000 miles in the sky to provide exact location coordinates on the face of the Earth in the format of an age-old navigational system of latitude and longitude. The forester utilizes the information received from these GPS satellites to save tremendous amounts of time in completing the initial question of any forest survey, "How large is the forest boundary?" The forester only needs to locate the corners of the property, and he or she can quickly and accurately determine the size and location of the forested property in question. When the property is located either on a topographic map or an aerial photograph, the forestland manager is quickly able to initiate other surveys such as permanent inventory plots. Revisiting these saved locations in a GPS unit makes updating management plans more efficient and time saving for both the forester and landowner.

But what about the forest landowners themselves? Can GPS assist them in their work and questions that they have concerning their forested properties? Yes! GPS is a rather user-friendly and inexpensive tool to include in the management of all your forested and agricultural properties. GPS units for the novice forest landowner can be purchased for less than \$200 and can provide information about the location of property lines, land acreage, road locations, and other points of interest found on the property. If the landowner would like to map the information, additional mapping software can be purchased or utilized from the Web. These electronic maps can have the GPS data downloaded to them and then be utilized in the designing, updating, and future referencing of their forest management plan.

These less expensive GPS units purchased by landowners provide information that is not defined as exact. The units discussed will have an error of nearly 30 feet, but for simple referencing, they provide adequate measurement for the forest landowner. Professional foresters will typically use a more precise GPS unit with allowable errors that are often only within a foot.

It can be seen that forest landowners might utilize the full capabilities of their GPS unit quickly and then ask themselves the question, "What else can I use this GPS unit for?" One very interesting and ever expanding activity that can be used worldwide is called "geocaching" (www.geocaching.com). Geocaching is a form of the old scavenger hunt game, where you are given clues to the location and you then attempt to find the "buried treasure." The Web provides the latitude and longitude coordinates of the treasure and then you seek the location with these coordinates placed in your GPS. Nearly 500,000 caches are found in 200 countries. New ones, many already located in your local community, are set out weekly.

To find more information concerning how GPS technology works and how it is being used in our everyday lives, simply go to a Web search engine and type in GPS. Be careful—using a GPS can become habit forming.

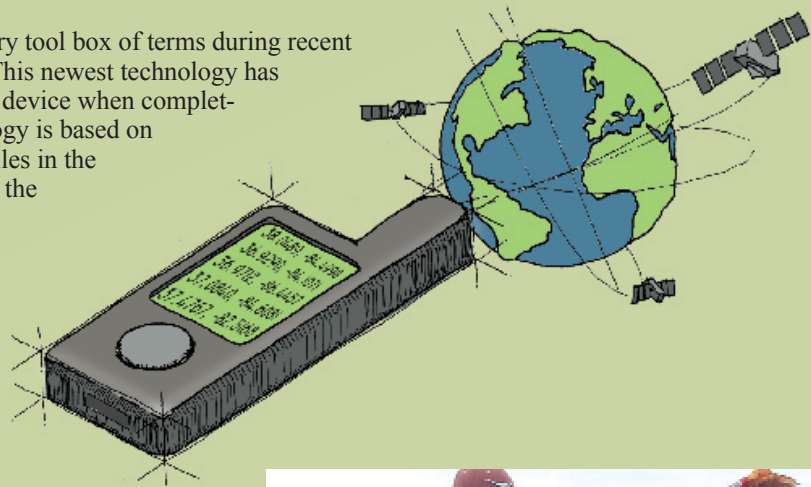


Photo courtesy: Doug McLaren

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By Diana Olszowy

Wildfire is one of the most destructive natural forces known to humankind. “Wildfire” is the term applied to any unwanted and unplanned fire burning in forest, shrub, or grass. Wildfires can be ignited by a variety of occurrences, such as an occasional lightning strike, but human-related activities start the majority of our fires every year. Nine out of 10 wildfires in Kentucky are caused by humans. Unattended or out-of-control campfires, debris burning, intentionally set arson fires, or even equipment use can set off a blaze, especially during extreme drought conditions, like those we are experiencing this year.

Once a wildland fire has started, many factors contribute to its spread and intensity:

- fuel, such as leaves, needles, grass, branches, and logs;
- weather, including temperature, humidity, precipitation, and wind;
- topography, including percent slope, aspect, and shape of the landscape.

Fuel

Forestland fuels are separated into four categories: grass, brush (briars, shrubs, etc.), forest debris (leaves, small twigs, etc.), and slash (left over after a timber harvesting operation, windstorm, etc.). Each category has its own set of characteristics and can result in different fire behavior.

Small and fine fuels (grass, shrubs) burn hot and quick (flashy fuels); while larger fuels (large branches and logs) burn more slowly and often smolder after the fire has passed. An old stump can actually burn for

several days after a fire has been safely controlled. These burning remains, called snags, are often the cause of fires restarting. Special fire-fighting tactics must be utilized when dealing with snags.

Weather

Weather is the most variable factor and affects fire behavior most often. Wind increases the rate and direction of fire spread. Relative humidity and temperatures mainly affect fuel moisture content. Changes in the weather, such as an approaching cold front, can greatly affect wind speed and direction, temperature, and relative humidity, which in turn can greatly affect fire behavior. Wind affects fire behavior by bringing the flame closer to the fuels, basically driving the fire in a particular direction.

In periods of extreme drought like this year, fire behavior is extremely erratic, causing dry roots of even living trees to easily ignite and burn underground and, unfortunately, under fire control lines. It can be very difficult to extinguish a fire that is clearly visible, but a fire burning below ground is almost impossible to control. Understanding the relationship of weather to fire behavior is the most critical issue that firefighters face.

Photos courtesy: Kentucky Division of Forestry



Where There's Smoke There's Fire

Topography

The topography of the site consists of percent slope (steepness of the hillside), aspect (direction the slope faces in relation to the sun), and the shape of the landscape (narrow hollows or broken cliff lines, etc.).

- The *slope* of the hill determines how fast a fire can advance uphill. When a fire travels uphill, its heat, with the help of wind, “preheats” the fuel and drives off moisture in front of the flame, making those fuels easier to ignite and increasing the rate of spread. Basically, the steeper the slope, the faster the fire travels.

- A south-facing *aspect* receives the greatest amount of sunlight and therefore is hotter and drier than other aspects. Fuel types are usually different as well, with drier site species prevalent. North-facing slopes are typically moister and cooler and often forested, and fuels will take longer to ignite with the fuel moisture content higher.

- The *shape* of the landscape (lay of the land) can change the wind flow and cause the heat to concentrate into a hol-



low, causing a chimney effect for the wind and flames to maximize its speed uphill. Narrow hollows and saddles (ridges between two peaks) can channel wind and fire at more than twice the speed up the hill. These areas are extremely dangerous for firefighters because the smoke and flames can overcome them before they have time to react or escape.

You can't outrun a wildland fire, and it's very difficult to outthink one, but you can protect your home and family by paying attention to the factors that affect fire behavior. For more information on how to become “firewise,” please visit www.forestry.ky.gov/programs/firewise/.

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Local Forestry Organizations: Why You Should Be Interested

By Vernon "Tad" Norris

You may have read recent articles about emerging local forestry organizations; if you are like many people, you may have thought to yourself, "Now there is something else that I'm interested in but really don't have the time to worry with."

If this is the case, the following facts may help convince you to make the time.

- Forestry is the "invisible" giant among all of Kentucky's land-use activities. Nearly half of all of Kentucky is covered with forestland (some 12 million acres). Unfortunately, it is not considered as glamorous, romantic, or important as horses, bourbon, or tobacco.
- Of Kentucky's 120 counties, 112 have one or more wood-utilizing companies. The annual payroll for these industries exceeds \$800 million.
- Everyone in Kentucky is just one step away from the forest industry. Many of us have a friend or family member who derives their livelihood as either a logger or worker in a primary or secondary wood industry.
- Kentucky's forests are a varied, constantly changing, and inherently renewable resource that requires management if society's demands (be they wood, habitat, or recreation) are to be met.
- Learning about "how a forest works" is just plain fun. No other resource is more directly tied to Kentucky's past and present. Kentuckians are perhaps more proud of their roots and heritage than folks from any other part of the country. Who has a dry eye after hearing a recording of Happy Chandler singing "My Old Kentucky Home"? Who hasn't heard the old joke about Kentuckians already in Heaven coming back to the old home place for the weekend? Don't we owe it to our forefathers and the generations to come to learn about and properly care for this unmatched, God-given bounty?
- Forest management can put dollars in your pocket while helping you reach whatever goals you may have for your forest.
- 78 percent of Kentucky's forests are



Photo courtesy: Kentucky Division of Forestry

owned by only 10 percent of Kentucky's citizens (non-industrial, private landowners). To avoid a "tyranny of the majority" in land-use policies and laws, the minority must have a strong and loud voice in the public arena. Should folks who own no forestland tell those who do how to manage their property?

Established groups are currently addressing and working on solutions to various problems, including forestland taxation, forest health, the invasion of exotic species, and the lack of markets for low-quality logs (to name just a few).

If you would like to participate in an already established local forestry organization or if you live in an area that needs to have one, please consider taking action.

These groups are strongly supported by the Kentucky Division of Forestry, University of Kentucky's Department of Forestry, the University of Kentucky Cooperative Extension Service, the Kentucky Division of Conservation, the Kentucky Woodland Owner's Association, the Kentucky Forest Industries Association, and Farm Bureau.

Please contact either Tad Norris (Division of Forestry, 800.866.0555) or Billy Thomas (Cooperative Extension Service, 859.257.9153) for more information.

Note: Acreages, dollar amounts, and percentages were either taken directly from or derived from University of Kentucky Cooperative Extension Service publication FOR-53 by Thomas, Stringer, Conners, Hill, and Barnes.

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Registration includes field trips, reception/dinner (Friday) and program/presentations on topics of interest to woodland owners (Saturday).

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Riparian Buffer Strips is the third in a five-part series of Agroforestry articles. Agroforestry includes the following other practices: alley cropping, silvopasture, windbreaks, and forest farming. See Kentucky Woodlands Magazine Vol. 1 Issue 2 for more information.

Non-Timber Forest Products

Agroforestry Part Three: Riparian Buffer Strips

By Deborah B. Hill

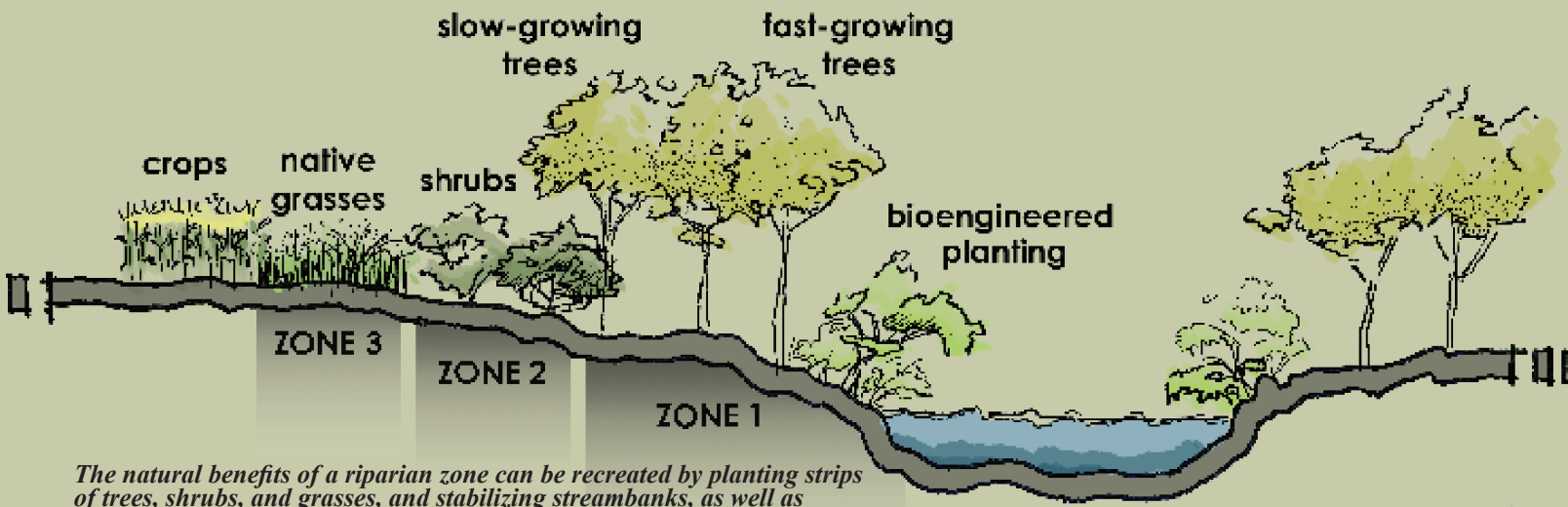
The third of the five agroforestry systems that would be practical to implement in Kentucky is riparian buffer strips. The Kentucky Water Quality Act of 1994 encouraged farmers to protect their streams from soil erosion and compaction from livestock. Best management practices (BMPs) for landowners who are harvesting timber require streamside management zones (SMZs). Both of these are similar to riparian buffer strips except that in the buffer zones designed in agroforestry, the landowner implements a specific series of zones of native trees, shrubs, and grasses a) to protect the temperature and clarity of moving water and b) to prevent agricultural chemicals and soil from eroding directly into stream water.

A classic riparian buffer strip is fairly wide (the USDA/Forest Service recommends a total of 66 feet) with three distinct bands or zones. Zone 1 is directly next to the water and consists of native riverbank tree species such as sycamore (*Platanus americana*), river birch (*Betula lenta*), native poplars (*Populus* species, not tulip-poplar, which is something else), red maple (*Acer rubrum*), or willows (*Salix* spp.) and tree species that are able to become established and grow rapidly. Zone 1 should be left as un-

disturbed as possible, although if the landowner selects tree species that can be coppiced (ones that readily resprout when cut), there is potential for some utilization of the tree species at a later time.

Zone 2 is farther away from the water and consists of native shrub species. Depending on whether the landowner would like some type of non-timber forest product to sell or would like flowering species that would be aesthetically pleasing, a mixture of shrubs could be planted, including, for example, dogwoods (*Cornus* spp.), corkscrew willow (*Salix matsudana* ‘*Tortuosa*’), etc.

Zone 3 is the most interior of the three zones and consists of native grasses and forbs. This too, once established, could be mowed for a crop or as forage for livestock but should be left



The natural benefits of a riparian zone can be recreated by planting strips of trees, shrubs, and grasses, and stabilizing streambanks, as well as constructing small wetlands to capture tile flow from nearby fields.

undisturbed until it is fully established.

The most obvious benefit of riparian buffer strips is protection of water quality. However, they also control surface runoff and soil erosion, stabilize eroding stream banks, and, depending on species selected, supply food and cover for wildlife. In addition, they improve aquatic habitats for fish and other aquatic species and potentially can generate income from harvested timber and non-timber forest products.

When selecting species for the different zones, choose tree species for the streamside zone that are water loving and flood resistant. It is not necessary to select shrub species for Zone 2 that are flood resistant because these species will be located farther from the water than the tree zone. As with all agroforestry systems when one is mixing tree, shrub, and herbaceous species, it is important to be sure the ones chosen are compatible with one another and that whatever fertilizers and/or pesticides needed will be tolerated by all species involved. Since the purpose of the riparian buffer strip is to protect the stream and filter unwanted materials, the spacing of both trees and shrubs should be relatively tight—6 to 8 feet apart for tree species and 3 to 4 feet apart for shrub species. The herbaceous layer of grasses and forbs should be seeded densely.

Some things to consider, especially if the stream banks are both steep and susceptible to erosion, are whether special bioengineering of the banks is necessary, involving such things as geotextiles, rip-rap, gabions, or fascines (bundled fresh-cut branches tied together and placed parallel to the stream to form “logs” that can be buried and may sprout new growth to resist stream flow). If agricultural fields near the stream have been tiled, do not plant tree species near the tiles—grasses only!

Once established, riparian buffer strips should begin to take on the appearance of a natural forest. Loss of income from land taken out of agricultural production to establish such buffer strips should eventually be offset by products that can be harvested from the strips themselves. Also, agricul-

tural crops will not suffer from flooding as they might have prior to the establishment of the riparian buffer strip.

If a landowner has only forest land and is considering a timber harvest at some time in the near future, the area closest to the streams could be managed along the same lines as a riparian buffer strip and have shrubs and/or grasses interplanted among existing trees to protect the streams during the harvesting operation.

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Kentucky Big Tree Program

What's Brown and White and Flaky All Over? American Sycamore

By *Diana Olszowy*

Our native Sycamore is a common yet distinctive sight in both natural and planted landscapes. Its bark—a “camouflage” pattern of peeling patches like tan, gray, and brown puzzle pieces—eventually turns to a smooth white on the mature trunk and upper branches.

Sycamores hold the record for the broadest trunk of a native tree in the eastern United States, averaging over 10 feet in diameter and 80 feet tall. Kentucky just happens to have the largest known specimen and the current national champion growing in Montgomery County. This champ measures a whopping 35 feet in circumference and 62 feet in height, and it has an average spread of over 82 feet. It is entirely hollow but is so massive that it can provide shelter from rain for at least a dozen people at one time.

Sycamores prefer growing in rich, well-drained soils along streams and rivers. They grow quickly and can live for hundreds of years. This champ has no living interior wood, so it has no rings to count, which makes estimating its age very difficult. But you could safely say that it has to be several hundred years old since its largest neighbors are approximately 100 years old.

The wood of Sycamore is moderately hard, heavy, strong, and resistant to shock. It is not durable and should not be used where it is exposed to moisture or conditions favoring decay. The primary uses are for veneer, boxes, flooring, pallets, crates, and butcher blocks because it is very difficult to split. Sycamores bear large, coarse leaves resembling maples in shape and make excellent shade trees

for urban settings. They are also planted as park trees because of their fast growth, handsome appearance, and ability to withstand winds. Due to their large size and habit of shedding leaves, seed balls, and bark, Sycamores are best suited for use in large landscapes. Sycamores tolerate compacted soil and air pollution and can withstand heavy pruning. They are, however, bothered by several insects and fungus diseases, which may weaken trees but rarely kill them.

The major disadvantage of Sycamore as a landscape tree is the fungal disease anthracnose. The extent and severity of the disease varies with the spring weather; the cooler and wetter springs usually are associated with increased anthracnose activity. The disease causes deformity of the leaves, twigs, and buds but is seldom fatal since anthracnose attacks only the current year's growth.

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Photos courtesy: Kentucky Division of Forestry

Test Your Knowledge



Photo courtesy: David Blevins, Nature Photographer

A.

I am a fairly common species of hardwood tree that likes to grow in bottomlands near water. My nuts are a staple for squirrels and deer and my smooth gray bark resembles an elephant's hide and even Daniel Boone couldn't resist carving his initials on me. What am I?



Photo is from Eric G. Vallery, USDA Forest Service, SRS-4552, Bugwood.org

B.

I caused a lot of problems for pine trees in Kentucky back in 2000 and 2001 and I'm due to make my way back north around the year 2011. I am only 1/8th inch in size and I'm hard to see because I only feed on the inside of the pine. I may be small, but I am many and we are mighty. What am I?

C.

I am seen on many types of red oak species, more noticeably pin oak and I am commonly recognized as a black, woody glob growing on the twigs of the tree. I am caused by a tiny wasp that lays eggs on the twigs which causes them to swell. I can get over two inches in size and can become pretty heavy for the twig I am growing on, often causing it to break. I don't usually kill the tree, but I sure make it ugly. What am I?



Photo courtesy: Minnesota Department for Natural Resources, ForestPest.org

Answers to Test Your Knowledge can be found on page 24.

D.

I look like an overgrown hat rack. Whether I was "trimmed" because of a utility line clearance or they just wanted to make me look smaller and be shaped like a lollipop, I do not know. However, I do know that I will make every effort to replace what was removed, but since I wasn't "trimmed" correctly, the new flush of growth I will put out will be weakly attached. You will be not only be raking my leaves this fall, but you will also be picking up my new "branches" from your yard every time the wind blows hard. What has happened to me?



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



Photo courtesy: Eric Day, Virginia Polytechnic Institute and State University, Bugwood.org

E.

I am a common inhabitant of Kentucky. I'm most noticeable in late summer, early fall; however, I do most of my damage in the spring. I prefer to feed on the needles of arborvitae, pines and cedar. I re-infest the same tree and will eventually kill my host, but I will overwinter in my own self-made bag and I'll be visiting your yard soon. What am I?

Kentucky Woodland

Certified Logging Program in Kentucky

A new certification program for Kentucky loggers is underway. The Certified Master Logger Program is being piloted in western Kentucky (and western Tennessee) and is a voluntary program for logging firms owned by Master Loggers. These firms agree to abide by a set of written standards of good logging practice. These firms also agree to spot audits of their operations to ensure that they are conducting their operations according to these standards.

The current Kentucky Master Logger Program provides training for individual loggers and the Certified Master Logger Program provides a way for logging firms to be certified in the use of practices that are taught in the program. Forty-two logging firms are enrolled in the program and currently undergoing audit. This winter the Rainforest Alliance will provide 3rd party evaluation of the entire program to their SmartLogging standards that is designed to lead to certification of the program. This means that landowners will have a group of certified loggers whose business and field performance can be guaranteed.



Photo courtesy: Jeff Stringer

Hispanic chainsaw operator for Holt Logging getting checked for use of personal protective equipment during delimiting operations.

Emerald Ash Borer Update

The Kentucky Division of Forestry is working on its 40 trap-tree sites across the state this fall. Felled and de-barked trees have been negative so far for the presence of Emerald Ash Borer (EAB) larvae.

It is interesting to note that the focus of EAB detection has changed. In the past, the focus was the lower bole of the tree and looking for the characteristic “D-shaped” exit holes. However, after attending a meeting and site visit in Cincinnati this summer, that detection method will not uncover newly-infested trees.

EAB initially infests the crowns of trees and therefore the symptom to look for first is crown dieback. Ash trees with dead or dying branches may be in the initial stages of an EAB infestation. Examination of the crown branches and the upper bole will reveal the possible signs of an EAB infestation, namely the presence of the “D-shaped” exit holes and vertical bark splits. EAB larvae may cause the bark to split where larva is just under the bark.



Photo courtesy: Joseph O'Brien, USDA Forest Service

Exit holes on the lower bole would indicate that the tree has been infested for several years and it may be too late to save the tree at this point. Early detection must begin with emphasis on detecting symptoms in the crown. The Cincinnati site (only four miles from Kentucky’s border) is thought to have been infested as early as 2002, although it was only discovered this summer.

2007 Tax Tips for Forest Landowners

Linda Wang, Forest Taxation Specialist and John L. Greene, Research Forester, Southern Research Station recently released the *Tax Tips for Forest Landowners for the 2007 Tax Year*. This publication is a must read for woodland owners that conducted a timber sale or had forestry related activities in 2007. You can get a copy of the publication by visiting www.ukforestry.org and clicking on “New Information” or calling 859.257.7597 and requesting a copy. Additional information regarding forestry related taxes can be found at the National Timber Tax Website: www.timbertax.org

Answers to Test Your Knowledge on page 23

- E. BAGWORM
 - D. TOPPED TREE
 - C. HORNED OAK GALL
 - B. SOUTHERN PINE BEETLE
 - A. AMERICAN BEECH
- of this issue
questions found on page 23

News To Use

Fire Situation in Kentucky

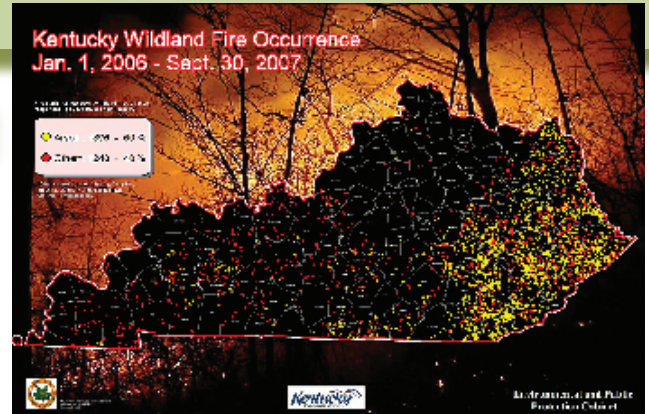
This year's drought started our fall wildland fire season (normally Oct. 1 to Dec. 15) in July with an increase in accidental fires. Many of these fires were started in unusual ways: farm and construction equipment, sparks from railroads, catalytic converters, electric fences, internal combustion in rolled hay and improperly disposed of cigarettes under normal weather conditions would rarely cause a fire. By September, arson became the leading cause of wildland fire, with more than 60 percent intentional.

Kentucky has two wildland fire seasons, Oct. 1 to Dec. 15 (fall fire season), and Feb. 15 to April 30 (spring fire season). During these official wildland fire seasons:

It shall be unlawful for any person to set fire to, or procure another to set fire to any flammable material capable of spreading fire, located in or within 150 feet of any woodland or brushland, except between the hours of 6 p.m. and 6 a.m. or when the ground is covered with snow. (KRS 149.400)

In early October, with Kentucky's forests in their worst tinderbox state, Gov. Ernie Fletcher enacted a statewide burn ban which prohibited all outdoor burning. This action significantly assisted KDF in their fire suppression efforts. The statewide burn ban remained in place for two weeks and many counties kept their local burn bans in place until November. Throughout November, we have been blessed with significant rainfall events that have reduced wildland fire activity.

For more information about current and historical wildland fire activity in Kentucky, please visit the division's fire pages <http://www.forestry.ky.gov/situationreport/> or <http://www.forestry.ky.gov/programs/firemanage/Fire+Statistics.htm>



Kentucky Tree Farm Committee Launches Website

The Kentucky Tree Farm Committee has recently launched a website. The Kentucky Tree Farm Committee promotes actions that sustain forests, watersheds, and wildlife habitat through the power of private stewardship. Family forests approved for the American Tree Farm System are recognized by the Sustainable Forestry Initiative (SFI) and meet current standards qualifying tree farms as SFI certified wood. The Tree Farm System operates as an informal partnership encouraging resource management professionals from all disciplines and segments (forest industries, public agencies, private forestry consultants, and forest landowner organizations) to work together and offer expertise to family forest owners. Visit the website at <http://www.kytreefarm.org/>.



Dates To Remember

Date:	Event:	Location:	Contact:
February 20, 2008	Kentucky Woodlot\$: "Capture the Value" Conference	Pulaski County	606.677.6186/www.centertech.com
March 15, 2008	Tri-State Woodland and Wildlife Workshop (KY-IN-OH)	Campbell County	859.257.7597/www.ukforestry.org
April 2-4, 2008	Kentucky Forest Industries Association Annual Meeting	Kenton County	502.695.3979/www.kfia.org
April 10-13, 2008	Central Kentucky Home & Garden Show	Fayette County	606.666.2438 x235/ www.kyhomeshow.com
April 18-19, 2008	Kentucky Woodland Owners Annual Meeting	Bell County	606.876.3423/ www.kentuckywoodlandownersassociation.com



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Where There's Smoke There's Fire

**Check out
the Kentucky Division
of Forestry's Tree
Seedling Order Form.**

**Online version at
www.ukforestry.org!**