



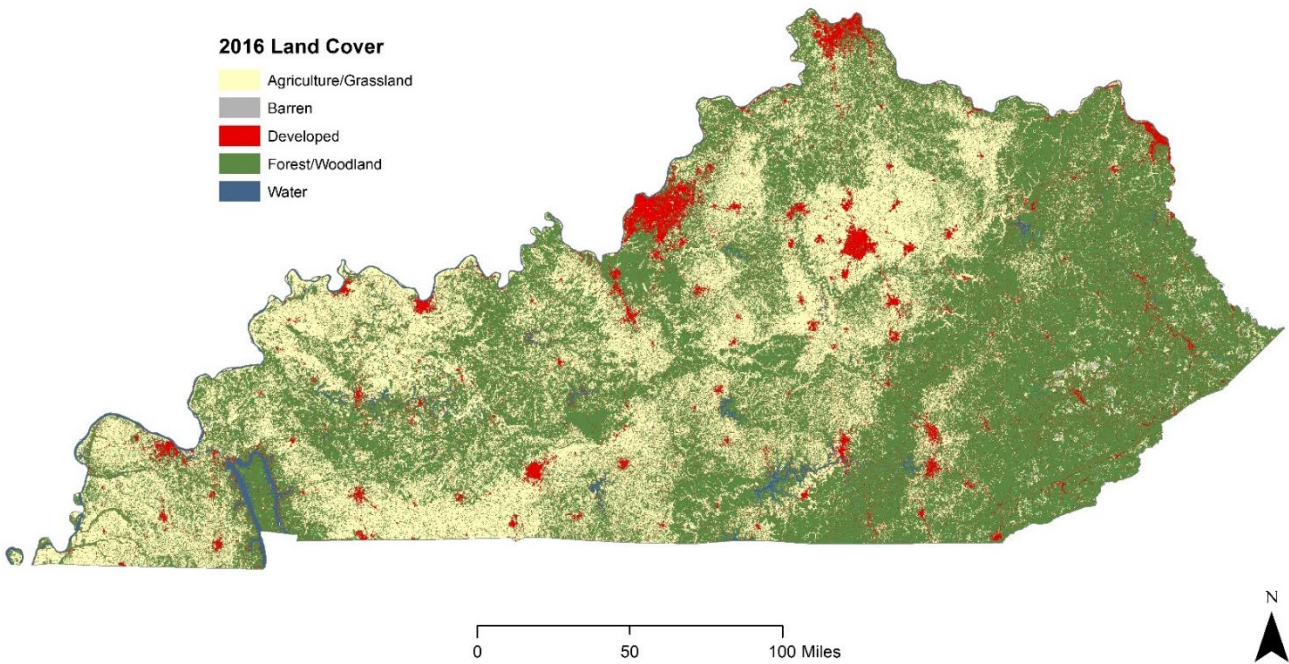
Kentucky

Forest Health Highlights 2020

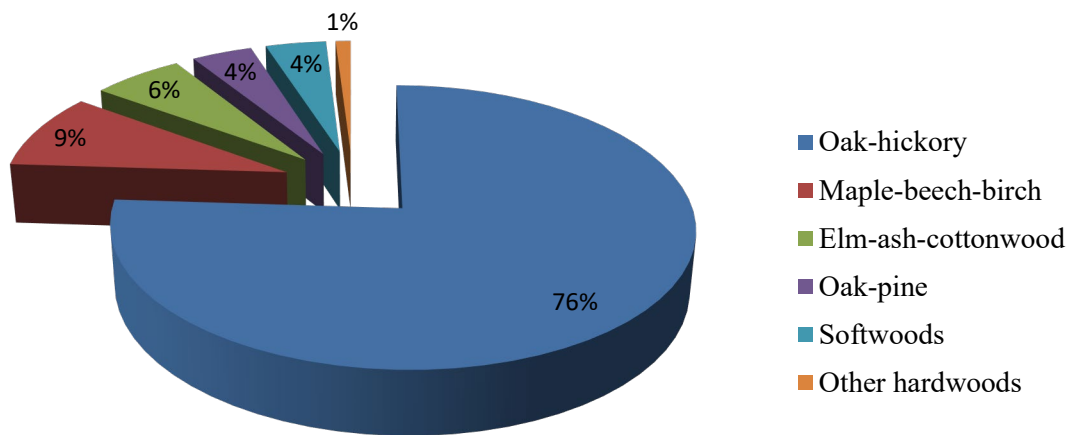


The Resource

Kentucky is home to vast forestlands that are filled with approximately 7.44 billion live trees, which contain 26.69 billion cubic feet of wood. This makes Kentucky's forests a vital source of aesthetic, economic, and ecological value. They provide scenic beauty, support outdoor recreation and tourism, and provide critical wildlife habitat from the eastern Appalachian Mountains to the western Mississippi Valley. Woodlands cover an estimated 12.38 million acres within the state, which equates to 48% of Kentucky's land area. The eastern portion of the state, specifically counties within the Appalachians and the Cumberland Plateau, represent the most heavily forested areas. Many of these counties contain woodlands that cover more than 80% of the land area. The majority of the state's forestland, approximately 88%, is privately owned. While approximately 10% of forestland is federally owned and the remaining 2% owned by state and local entities. Kentucky has one of the most diverse hardwood mixes in the nation, yet the predominant forest type is oak-hickory, which covers nearly 9.5 million acres or 76% of the forested land. The most common species are red maple, sugar maple, and yellow-poplar.



Kentucky Forest Type Distribution

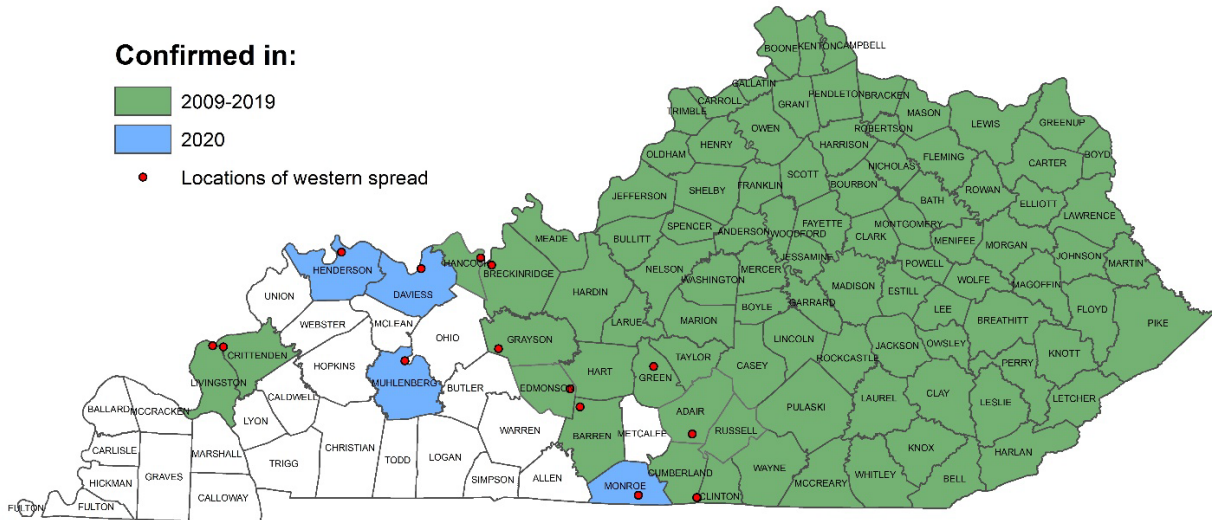


Insects

Emerald Ash Borer

Infestations of the emerald ash borer (EAB) were first confirmed in Kentucky in 2009. A quarantine of 20 northern Kentucky counties, located in the region between Louisville and Lexington, was initially established. In the following years, additional EAB infestations were found in nearby counties and the state quarantine was expanded. In April of 2014, the county quarantine system was rescinded and the entire state was added to the USDA APHIS list of regulated areas. In September of 2018, APHIS published a proposal to remove domestic quarantine regulations for EAB. The public comment period has closed, yet the ruling has not been released. Currently, EAB has been confirmed in 96 Kentucky counties. In 2020, EAB was confirmed in four new counties: Daviess, Henderson, Monroe, and Muhlenberg. EAB will eventually impact ash resources across the entire state as the infestation continues to spread into western Kentucky. Infestations in neighboring states of Indiana, Illinois, Missouri, and Tennessee can only aid this expansion within the coming years.

EAB Infested Counties



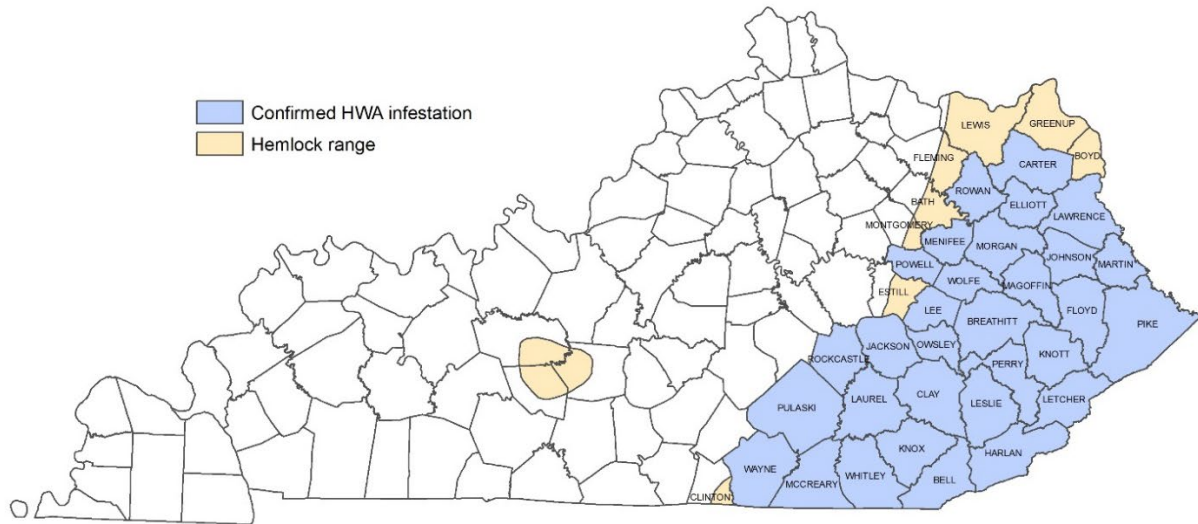
Last updated: September 16, 2020

Hemlock Woolly Adelgid

The hemlock woolly adelgid (HWA) was first discovered in Kentucky in 2006. Approximately 98% of Kentucky’s hemlocks are found in the eastern one-third of the state. In this region, infestations currently occur in 31 counties. The counties include Bell, Breathitt, Carter, Clay, Elliott, Floyd, Harlan, Jackson, Johnson, Knott, Knox, Laurel, Lawrence, Lee, Leslie, Letcher, Magoffin, Martin, McCreary, Meniffee, Morgan, Owsley, Perry, Pike, Powell, Pulaski, Rockcastle, Rowan, Wayne, Whitley, and Wolfe.

The Kentucky Division of Forestry (KDF) has a field crew responsible for treating hemlocks to prolong the survival of this ecologically significant tree. Chemical insecticide treatments are employed in order to suppress hemlock woolly adelgid populations. Treatments began in 2009 on Kentucky State Forests and has since expanded to include properties managed by the Kentucky State Parks, Office of Kentucky Nature Preserves, KDFWR Wildlife Management Areas, and USFS Daniel Boone National Forest (DBNF). Since 2009, KDF has chemically treated over 192,000 hemlock trees.

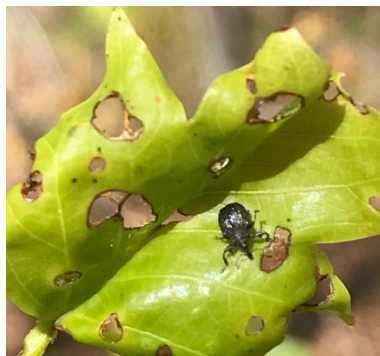
KDF has also continued the release of two species of predatory beetles that feed especially on HWA within the DBNF in hopes of establishing a field insectary site. Although there has been no confirmed evidence of predatory beetle establishment within release sites to date, upcoming releases will take place adjacent to previous release sites to augment chances of establishment.



Hemlock Woolly Adelgid Distribution 2020

Yellow-Poplar Weevil

Much of eastern and central Kentucky experience periodical outbreaks of the yellow-poplar weevil. Generally, this native insect is considered a minor pest, but the weevil was reported at higher than normal levels the past few years. For the fourth consecutive year, feeding damage from this forest pest has been observed in locations across eastern Kentucky. However, this year's damage seems to be lesser in severity and spread as in previous years. Two limited surveys were conducted to determine the general extent. No major decline has been documented from the recent infestations, though periods of drought that occurred in 2019 and the consecutive late cold snaps that followed this year could lead to future localized decline.





Scarlet Oak Sawfly

This year, browning oak trees in central Kentucky, specifically Bullitt and Franklin counties, were reported for the first time. After further investigation, this native forest pest's feeding damage was found to be the causal agent. Limited ground surveys were conducted to determine the extent of the damage. No major decline has been noted, though recent extreme weather events could lead to future localized decline. Normally, this damage type has most often been observed in the eastern portion of the state.





Oak Shothole Leafminer

Outbreaks of the shothole leafminer are normally sporadic. However, parts of the eastern United States experienced an outbreak this year. Feeding damage from this native fly species was detected across the entire state. Red and white oaks alike displayed the shothole signature in central, western, and eastern Kentucky counties. No formal surveys took place to record this damage in Kentucky this year, but rather general observations were used to record locations that experienced widespread damage.





Locust Leafminer

Outbreaks of the locust leafminer are very common. These outbreaks vary in intensity and location from year to year. This year, damage was detected across many of Kentucky's north central counties. No formal surveys take place to record this pest annually due to the persistent damage year to year, but rather general observations are used to record hotspots that experience damage each year.





Gypsy Moth

Gypsy moth surveys have been conducted since 2005 through various agencies and programs. This pest is not yet established in Kentucky, although it has been detected every year since the surveys began. Kentucky's Office of the State Entomologist annually traps for gypsy moth using detection surveys through USDA APHIS and Slow the Spread programs. In 2020, traps were placed in 93 counties across the state. Four positive traps were found across the four counties with a total of six moths captured. Counties with positive traps include Barren, Campbell, Fayette, and Floyd. Positive trap catches were up from 3 moths captured in 2019, yet substantially lower than 68 moths in 2016, and 171 moths in 2015.



Asian Longhorned Beetle

The Asian longhorned beetle (ALB) continues to be a potential pest of concern for Kentucky. Although ALB has not been found in Kentucky, it was discovered in 2011 in Clermont County, Ohio, which is only 10 miles from the Kentucky border. More recently, ALB was confirmed in Charleston County, South Carolina just this June. Eradication efforts are currently underway. KDF works with various agencies to educate the public on ALB identification and signs of infestation.



Diseases

Thousand Cankers Disease and the Walnut Twig Beetle

This season KDF placed 8 funnel traps in six north central Kentucky counties to trap for the walnut twig beetle associated with thousand cankers disease (TCD). The counties include Franklin, Owen, Carroll, Gallatin, Boone, and Grant. Neither the fungus nor the insect vector of TCD have been confirmed in Kentucky even though the disease has been confirmed in neighboring state of Indiana, Ohio, and Tennessee for a number of years. Trapping for the walnut twig beetle will continue in 2021.



Bacterial Leaf Scorch

Bacterial leaf scorch is vectored by various leafhopper and treehopper species and it affects multiple tree species including elm, maple, sycamore, and oak. This disease is common on many urban landscapes throughout the state. This year numerous landowner reports, predominantly from central Kentucky, came in pertaining to this issue. Symptoms include a scorched leaf appearance that can begin to appear in July and progressively gets worse through the end of summer. Symptoms occur annually as the disease progresses through the crown. Reduced growth and branch dieback soon follow, resulting in slow decline and eventual death of the tree.



Laurel Wilt Disease and the Redbay Ambrosia Beetle

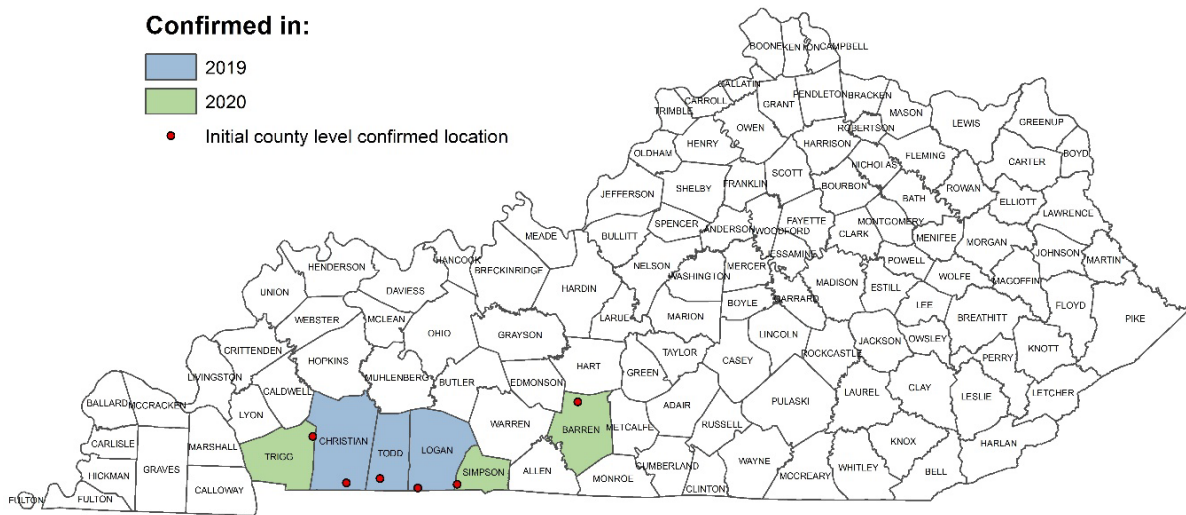
In 2019, Laurel Wilt Disease (LWD) was first documented in Kentucky in Christian, Todd, and Logan Counties. LWD was first confirmed inside the Fort Campbell Army Base in Christian county, Kentucky. After this initial detection, ground surveys were used to learn the extent of the outbreak. This year two of the new county detections, Trigg and Simpson, are alongside previously confirmed counties bordering Tennessee, where this disease has also been confirmed. However, the Barren County detection presents an outlier as it is more centrally located within the state.

Redbay ambrosia beetles vector LWD by boring into species of the Laurel family, such as sassafras and spicebush. A single female can transmit enough spores of the lethal fungus, *Raffaella lauricola* to kill a tree. The fungus infects the xylem, blocking off the vascular system and causing wilting and mortality. Mortality can occur within weeks to months after being infected. Signs of beetle activity include very small circular holes in the bark, occasionally accompanied by thin sawdust toothpicks of waste. Other symptoms caused by the fungal pathogen include wilting or early fall coloration of leaves on suspect trees that may remain attached for months. In most infected trees and shrubs the fungus causes distinctive, dark staining within the sapwood.

Next year, a pilot study in cooperation the USFS SRS will investigate the efficacy of a fungicide treatment as a method to combat this disease in municipal trees. The national champion, and possibly the world's largest, sassafras tree is located in Owensboro, Kentucky.



Laurel Wilt in Kentucky



Last updated: October 26, 2020

Other Damages

Frost/Freeze Injury

In the spring of 2020, Kentucky was hit hard by two major frost/freeze events. The first occurred over the days of April 15th and 16th where temperatures dropped to record lows across the entire state. Temperatures dropped into the mid-twenties in all regions and impacts to various forest types were observed. The injuries from this cold snap were worsened by the very warm weather, with temperatures in the 70s, just the month before. The temperature rise in March caused an early green-up in woodlands spanning the state. This young leaf development was essentially paused by the following cooler weather in April. The second late freeze hit Kentucky on May 9th and 10th where temperatures once again plummeted into the 20s and 30s statewide, setting a new record low. The hardest hit areas were in the mountainous regions of eastern Kentucky. This late cold snap had devastating impacts on orchard trees in the area such as apple, pear, and peach.

These two frost events damaged different species at various levels based on location within state and localized site conditions. Damage was highly dependent on what species were in the more susceptible early leaf out stages during the time of these events. The western portion of the state was further along in development during the April frost, which resulted in damages to species such as bottomland oaks. Yet, not damage occurred to the same or similar species in eastern Kentucky as they had not yet leafed out. Local site conditions such as broad elevation gradients, specifically areas with mountains and valleys, also impacted levels of damage.

Yellow-poplar and sycamore were two of the most widespread and damaged species statewide. Both species were generally hit twice by the back-to-back events and therefore experienced two defoliation events. It will be interesting to see how yellow-poplar responds after also being impacted by the severe drought in 2019. Reports and observations from the eastern region document extensive damage to poplar and sycamore in April and localized damage and delayed leaf out to bottomland oaks, hickories, ash, and walnut in May. In western Kentucky, bottomland oaks, yellow-poplar, blackgum, and sycamore were effected during the first cold snap. Surveys in central Kentucky confirmed once again widespread damage to poplar and sycamore in April's freeze event. During the May cold snap damage was seen in the Bluegrass Region to hackberry, mulberry, yellow-poplar, sycamore, sassafras, and walnut in locations that had already broken bud. In an additional survey of Knobs State Forest, damage was observed on forest edges to various species of hickory and red oak. Drainages throughout the state made up of yellow-poplar and sycamore were all damaged and vey delayed in new leaf growth. In some areas where conditions were just right, nearly all species that were green at the time were damaged by the extreme freeze. This produced noticeable lines between damaged low lying valleys and green areas in higher elevation.



References:

- [Kentucky's Office of the State Entomologist](#) provided data from their gypsy moth survey.
- 2016 Land Cover data was obtained through NRCS from the [National Land Cover Database](#).
- 2017 FIA One-Click Factsheet for Kentucky from the [USDA USFS](#)
- National Weather Service NOAA data obtained from https://www.weather.gov/jkl/mothers_day_weekend_freeze_2020
https://www.weather.gov/lmk/april_2020_summary
- Photos with image numbers taken from Bugwood.org

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