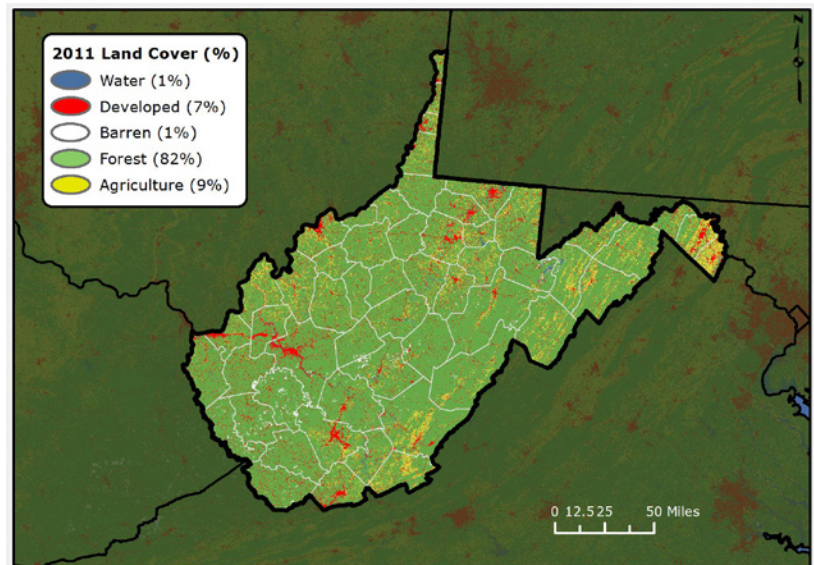




2016 Forest Health WEST VIRGINIA *highlights*

Forest Resource Summary

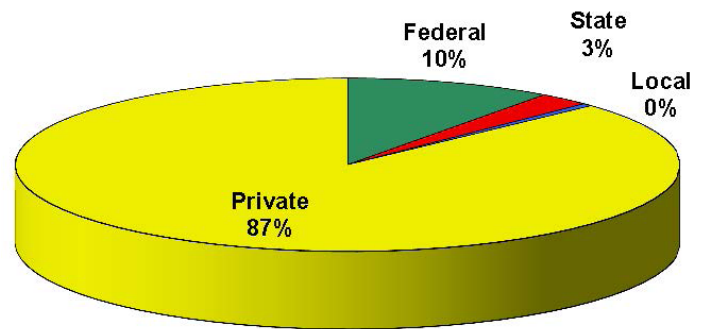
The West Virginia landscape is dominated by more than 11.8 million acres of forest. Due in large part to the State’s varied topography, the forest is a rich diversity of oaks, hickories, spruce, pines, and the West Virginia State Tree—sugar maple. Ninety percent of all forests in West Virginia are privately owned, but there are 8 State forests, 34 State parks, and 87 wildlife management areas that provide public enjoyment.



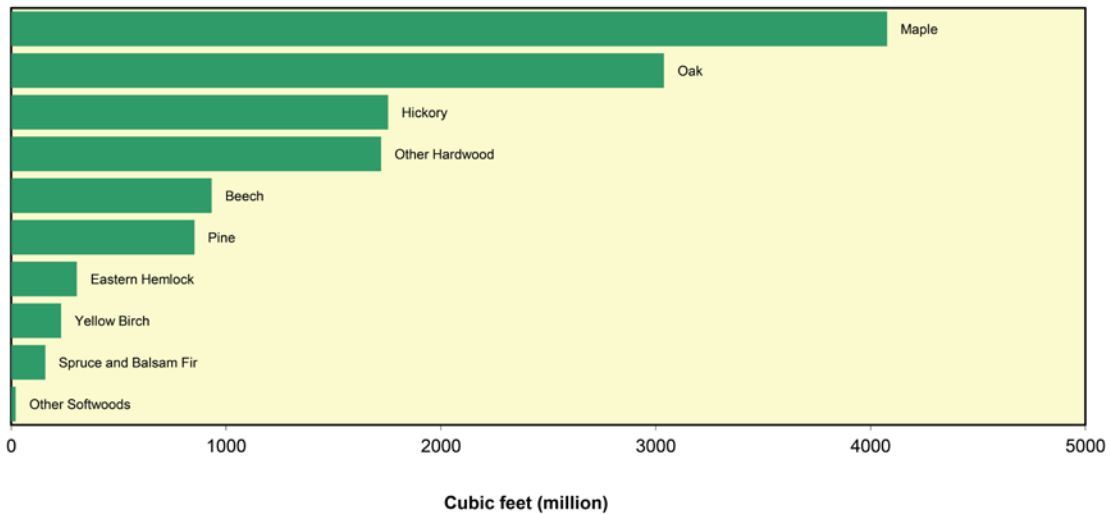
Forest Stewardship

The West Virginia Division of Forestry administers the Forest Management Program. The intent of the program is to help private, nonindustrial forest landowners improve their forests by managing them in a sound, scientific manner. Within this program, the Forest Stewardship Program offers a forest management plan written by a professional forester based on the landowner’s objectives. Other programs (Environmental Quality Incentives Program and Conservation Reserve Enhancement Program) provide financial assistance for recreation,

Forest Land Ownership in West Virginia, 2012



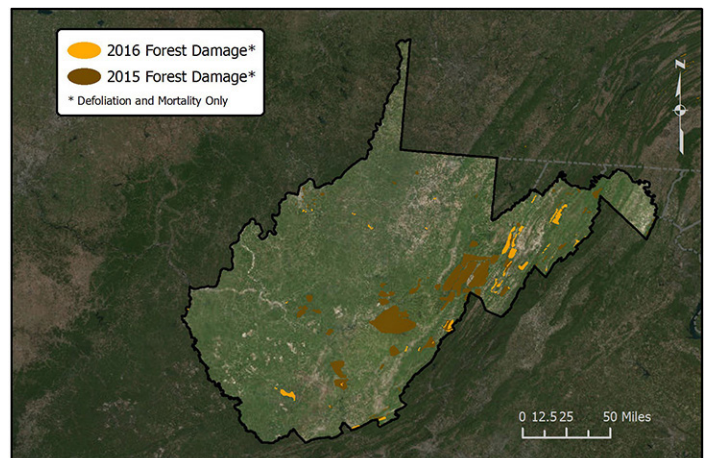
Net Volume of Growing Stock on Timberland by Species in West Virginia, 2012



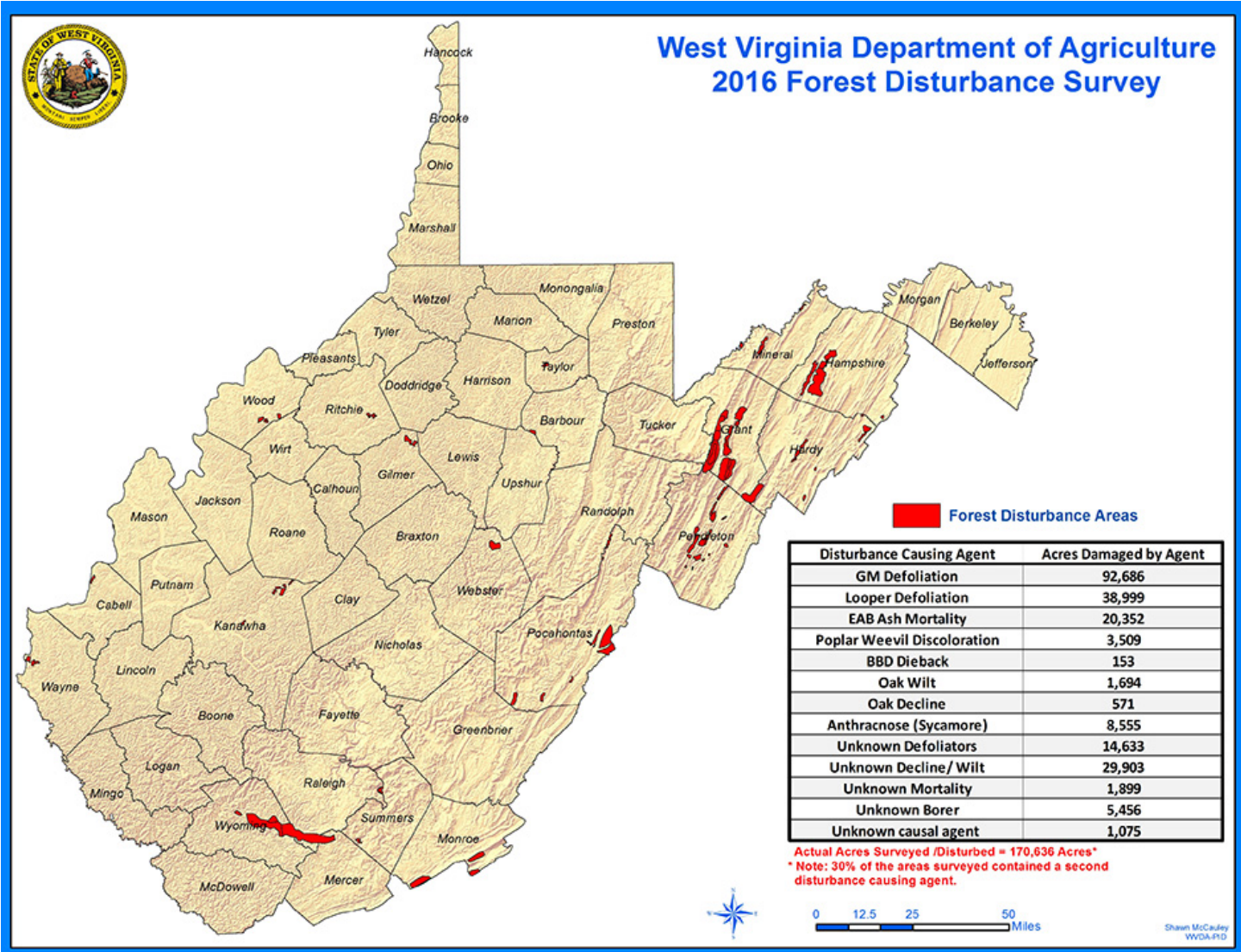
forest improvement, soil and water protection, wetlands protection, fisheries habitat enhancement, wildlife habitat enhancement, tree planting, and improvement of forest roads. In FY 2016, 60 stewardship plans were completed for a total of 8,795 acres. Currently 159,194 acres are managed under stewardship plans.

Forest Health Surveys

In 2016, the West Virginia Department of Agriculture (WVDA) continued using the [Forest Disturbance Monitor](#) to identify, survey, collect, and report large forest disturbances across the State. This application has replaced traditional aerial surveys for finding defoliation. In addition, WVDA began using GPS-enabled tablets with digital data forms and maps in 2015 to improve data collection and survey methods. A total of 170,636 acres were reported showing some type of damage, and all areas were verified by site visits.



Forest health survey observations in West Virginia in 2015 and 2016.



WVDA 2016 Forest Disturbance Survey

Special Issues

Gypsy Moth Program

The objectives of the West Virginia Department of Agriculture (WVDA) Gypsy Moth Program are to continue to minimize the adverse impact of gypsy moth on forest resources, preserve aesthetic values, protect people from the annoyance and health problems that can occur when in contact with large numbers of gypsy moth caterpillars, and slow the spread of gypsy moth by reducing populations on the advancing front.

Gypsy Moth Quarantine

West Virginia currently has 44 counties regulated and considered generally infested by gypsy moth. The WVDA regulates the movement of articles out of these counties into non-quarantined counties or States. There were no new counties quarantined in 2016.

Gypsy Moth Regulatory Treatments

There were no regulatory insecticide treatments in West Virginia in 2016.

Staff visited 59 sites to investigate the movement of articles capable of transporting gypsy moth into uninfested areas. Areas visited included Christmas tree sales lots, plant nurseries, mobile home dealers,

campgrounds, firewood producers, interstate weigh stations, log yards, sawmills, and relative trade shows.

Gypsy Moth Population

West Virginia’s gypsy moth population in 2016 is low in most areas of the State. The population is increasing in the eastern portion of the State. The fungus *Entomophaga maimaiga* caused a moderate collapse in the building gypsy moth population in some areas, but population densities above treatment thresholds are expected in Grant, Hardy, Monroe, Pendleton, Pocahontas, and Summers Counties. Gypsy moth defoliated a total of 92,686 acres in 2016. Potential defoliating populations for 2017 are expected in the eastern portion of the State.

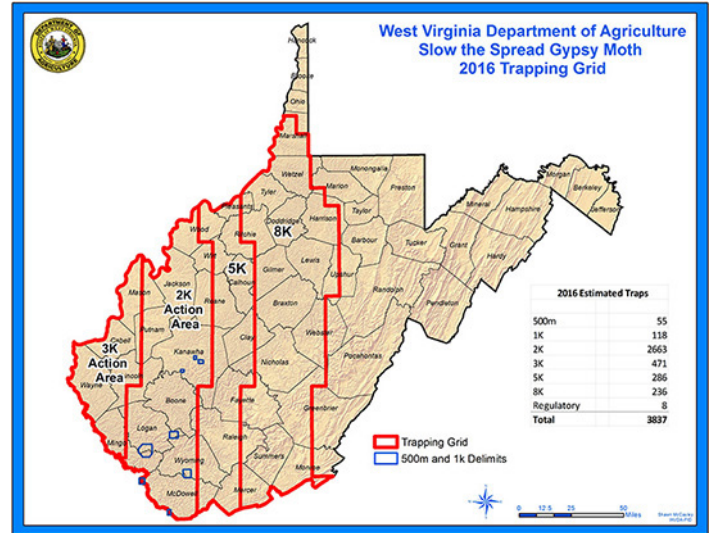
Gypsy Moth Cooperative State County Landowner (CSCL) Program

WVDA staff are currently responding to landowner requests and completing surveys on forested lands in West Virginia to determine areas at risk for gypsy moth defoliation and/or mortality in the spring of 2017. Staff is currently using 1/40-acre plot surveys to determine areas at risk and plan to have surveys completed by late December.

Larval insecticide treatments were conducted on 12,156 acres in the CSCL Program in 2016. Mimic and BTK were used to treat blocks in Grant, Hardy, Pendleton, Pocahontas, and Summers Counties.

Gypsy Moth Slow the Spread

There were no treatments within the Slow the Spread (STS) area for 2016 and no planned treatments for 2017. Gypsy moth populations are stagnated and are low in the western portion of the STS program area of West Virginia. The WVDA trapped 34,060 male gypsy moths in 2016 compared to 30,998 male moths in 2015. This increase in trap catch also occurred while placing an additional 56 traps within the STS area.



WVDA Slow the Spread Gypsy Moth 2016 Trapping Grid

2016 Gypsy Moth Traps by Trapping Grid

Grid	Proposed	Omits	Set
500m	55	0	55
1k	118	0	118
2k	2,663	0	2,663
3k	471	0	471
5k	286	0	286
8k	236	0	236
WV Regulatory	8	0	8
Totals	3,837	0	3,837

2016 Gypsy Moth Traps by Project Boundary

Project boundary	Proposed	Omits	Set
STS Action Area	3,313	0	3,313
STS Monitoring	524	0	524
WV Regulatory	8	0	8
Totals	3,837	0	3,837

2016 Gypsy Moth Traps by Trap Type

Trap type	Proposed	Omits	Set
Delta Traps	3,254	0	3,254
Milk Cartons	583	0	583
WV Regulatory	8	0	8
Totals	3,837	0	3,837

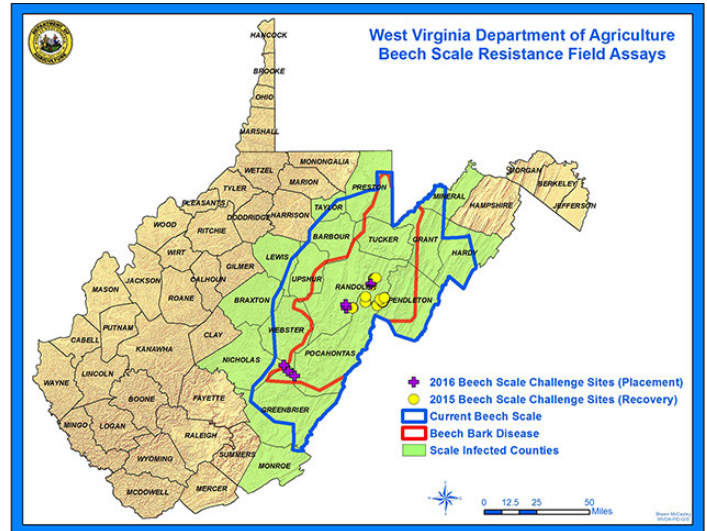
Forest Health Protection Programs

Diseases

Beech Scale Resistance Assays on the Monongahela National Forest

In 2016, WVDA staff collected challenge pads from the 2015 challenges (see map). There was more success with the challenges this year due to the addition of barbed wire to the pads to protect against bear damage. However, some controls did not work. This is in part due to the fact that these challenges are occurring in the aftermath zone where scale populations are low due to the lack of a healthy beech resource for them to survive on. The wet weather could have played a role in the lack of scale establishment as well. However, some control trees did develop a healthy scale population. These putatively resistant trees have also been tested against high scale pressure and disease over the years, especially through the active killing front stage. The fact that they are in groups together (related) implies that they are not escapes and are, indeed, resistant to beech scale.

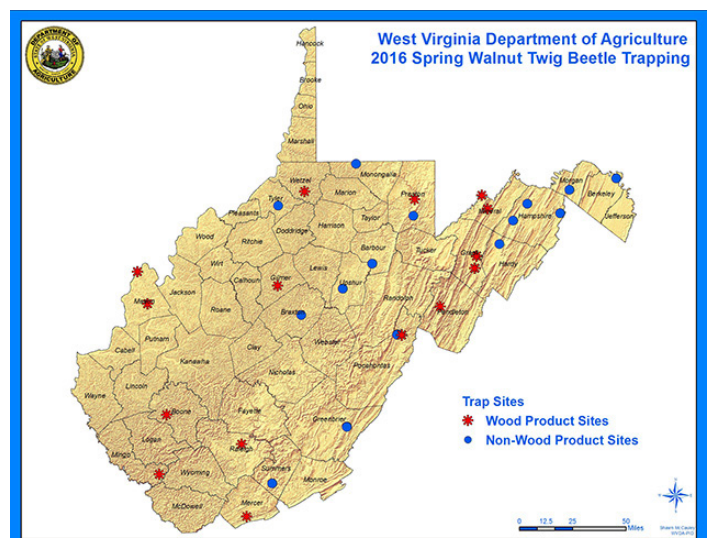
For the 2016 field scale challenges, WVDA staff conducted 37 scale challenges on putatively resistant trees and challenged 10 susceptible control trees (see map on upper right). These trees were ones that were challenged in 2014, but the work was lost due to bear damage and extreme weather. All of the trees remaining from the 2014 challenges were challenged again except for three due to running out of viable scale eggs. One site from 2014 could not be challenged since it was clear cut. Barbed wire was added around the pads again in an attempt to protect them from bear damage.



WVDA Beech Scale Resistance Field Assays

Walnut Twig Beetle Trapping

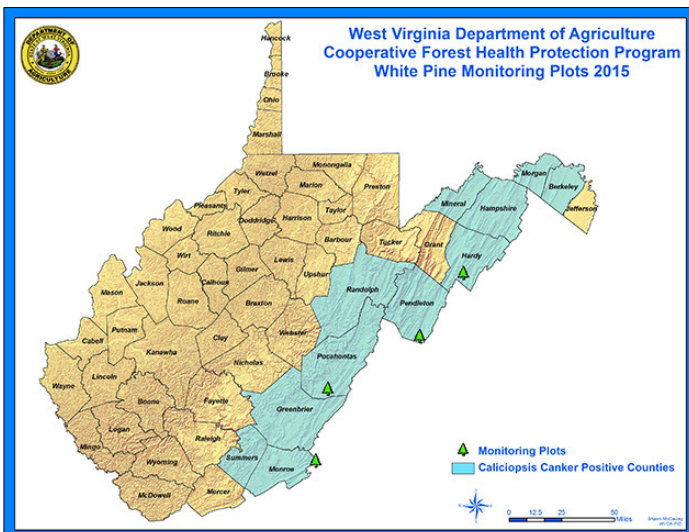
Spring trapping for the walnut twig beetle, the vector of thousand cankers disease, was completed and samples screened. Thirty traps were set and were monitored for 3 weeks in the spring (see map below) and were focused around wood product industries, campgrounds, and parks. Traps were serviced every 1 to 2 weeks depending on the amount of rain that fell during the trapping period. The WVDA Forest Pathologist and the WVDA Cooperative Forest Health Protection Specialist processed and screened the samples. All samples screened to date are negative for the walnut twig beetle. *A fall trapping effort of 59 traps was completed in October and results are pending at this time.*



WVDA 2016 Spring Walnut Twig Beetle Trapping

White Pine Monitoring

The fifth year of monitoring white pine in four 1/10-acre plots was completed. There aren't too many changes in the data overall, but there is still good reason to continue measuring these various trends for several more years before concluding anything about this insect/disease complex. The objective is to monitor changes in live versus dead volume in white pine due to the presence of *Matsucoccus* scale/*Caliciopsis* canker and other secondary pathogens.



Location of four white pine monitoring plots and West Virginia counties that have positive identifications of the *Caliciopsis* canker in 2015.

White pine in West Virginia is struggling to maintain its health in other areas as well. Disease issues aside from *Caliciopsis* canker have emerged in the past few years either due to favorable weather conditions, poor site quality, and/or overstocking in some areas. White pine needle damage due to needle cast/ blight diseases have been causing defoliation and decline in white pine in West Virginia. These outbreaks are most likely due to wet spring weather, which is favorable to disease development, over consecutive years. This issue will be investigated more thoroughly in 2017 in an attempt to identify what causal agents are at play along with delineation of the issue. This issue of white pine decline is also plaguing the Northeast, Southeast, and the Great Lake States.

Diplodia corticola (Bot Canker)

Dieback of red oak was reported in Seneca State Forest in Pocahontas County. *Diplodia corticola* was identified as a contributing factor to the decline by the U.S. Forest Service. This is the first report of this canker on red oak in West Virginia. Surveys are being conducted to better understand this disease and its distribution throughout the State.

National Plant Protection Laboratory Accreditation Program

Personnel from the WVDA, Plant Industries Division, Plant Pathology Laboratory participated again in the National Plant Protection Laboratory Accreditation Program at the USDA Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Center for Plant Health Science and Technology. WVDA Plant Pathology Laboratory personnel were accredited in 2016 to perform validated diagnostic tests for *Phytophthora ramorum* (causal agent of sudden oak death).

Insects

Hemlock Woolly Adelgid

Hemlock woolly adelgid (HWA) can now be found in 48 West Virginia counties. WVDA continued to treat high-value and high-visibility infested hemlocks with imidacloprid by inserting CoreTect™ tablets into the soil and injecting trunks. In 2016, 555 hemlocks were treated on State lands. Previous release sites of *Laricobius nigrinus* were monitored for predator survival and impact on HWA.

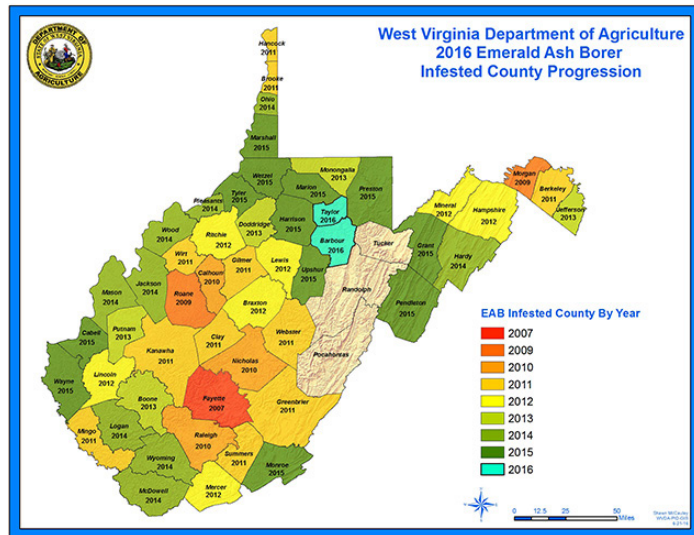
Resistant Hemlock Planting

WVDA was one of nine agencies to receive hemlock saplings that are potentially resistant to HWA. These "Bullet Proof" hemlocks are from a stand of hemlocks in New Jersey that have been monitored for the past decade and appear to have a certain level of resistance to the invasive pest. This project is funded by the U.S. Forest Service and is a cooperative effort with other State agencies in the Northeastern United States. The 10 putatively resistant

trees were planted at Kanawha State Forest in October of 2015; as of this writing, 9 of the 10 trees have survived. The hemlocks will be inoculated with adelgid in the spring of 2017.

Emerald Ash Borer

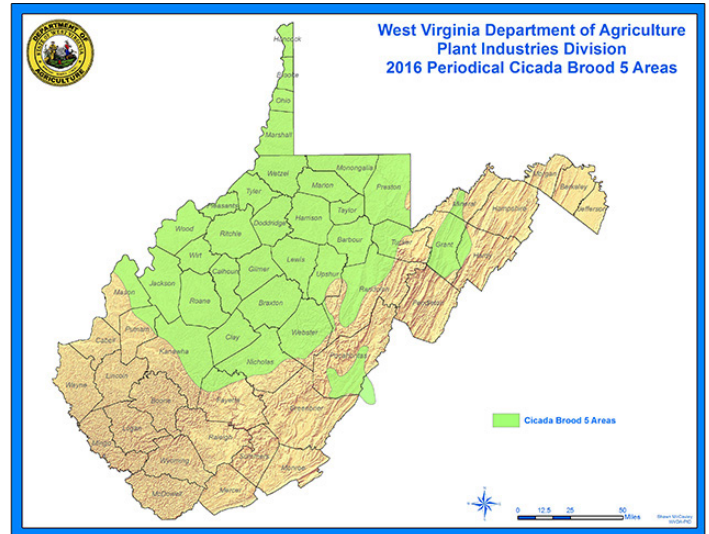
Two new West Virginia counties, Taylor and Barbour, were positively confirmed for emerald ash borer in 2016. This brings the total number of infested counties in West Virginia to 52.



WVDA 2016 Emerald Ash Borer Infested County Progression

Periodical Cicada

In spring of 2016, the 17-year cicadas (Brood V) emerged in Maryland, New York, Ohio, Pennsylvania, Virginia, and West Virginia. The cicada species that emerged were *Magicicada cassinii*, *Magicicada septendecim*, and *Magicicada septendecula*. The last time they appeared was in 1999.



WVDA 2016 Periodical Cicada Brood 5 Areas

Forest Fire

Wildfire suppression is one of the most important activities of the West Virginia Division of Forestry. In FY 2016, Division of Forestry personnel and volunteers fought 816 wildfires that burned 26,875 acres. These fires caused \$8 million in damage to the natural resources of West Virginia and more than \$162,000 in personal property loss. The number of fires and acreage burned was significantly above the 10-year average. Debris burning, equipment use, and incendiary were the leading causes of forest fires, accounting for about 90 percent of the total number of fires. Incendiary caused 222 fires that burned the most acreage, more than 10,500 acres. This was 40 percent of the total number of acres burned. Powerlines caused only 10 percent of the number of fires but burned almost 9,000 acres. Equipment use caused 214 fires that burned over 3,600 acres. Debris burning caused 235 fires that burned over 2,800 acres. The total number of fires in FY 2016 was 8 percent more than the 5-year average, but the acreage burned was 75 percent more than the 5-year average.

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http://www.fs.fed.us/sites/default/files/media/types/publication/field_pdf/GTR-WO-91.pdf. (1 March 2016).



Forest Health Programs

State forestry agencies work in partnership with the U.S. Forest Service to monitor forest conditions and trends in their State and respond to pest outbreaks to protect the forest resource.

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