

2016 Forest Health INDIANA highlights

Forest Resource Summary

Reflecting the effect of past glaciations, forests exist in large consolidated blocks chiefly in the hilly southern part of the State. In the northern two-thirds of the State, forests generally occupy scattered woodlots, wetlands, and riparian corridors.

Currently, Indiana houses nearly 4.9 million acres of forest land (figure 1). Forested area has increased by about 2.1 percent (101,000 acres) since 2010. Timberland accounts for nearly 97 percent, while the remaining 3 percent of forest is reserved or unproductive (figure 2).

Eighty-four percent, or more than 4.1 million acres, of forest land is privately owned. State and local government own 8.0 percent (392,000 acres) while the Federal government owns roughly 7.5 percent (365,000 acres). A little more than 3 percent (161,200 acres) of forest land is considered reserved.

Indiana has surprisingly diverse forests that encompass forest types from northern maple/beech/birch to southern bald cypress swamps and are dominated by the oak-hickory type in south-central Indiana. The Forest Inventory and Analysis (FIA) survey identified 95 different tree species growing in Indiana forests. Hardwoods are the dominant species in Indiana. The oak/hickory group alone occupies 71 percent of forest land, the bulk of which resides in the white oak/red oak/hickory forest type with the remainder classified as softwoods or nonstocked.



Figure 1.—Indiana’s forest cover map. Areas shaded in green are forested areas.

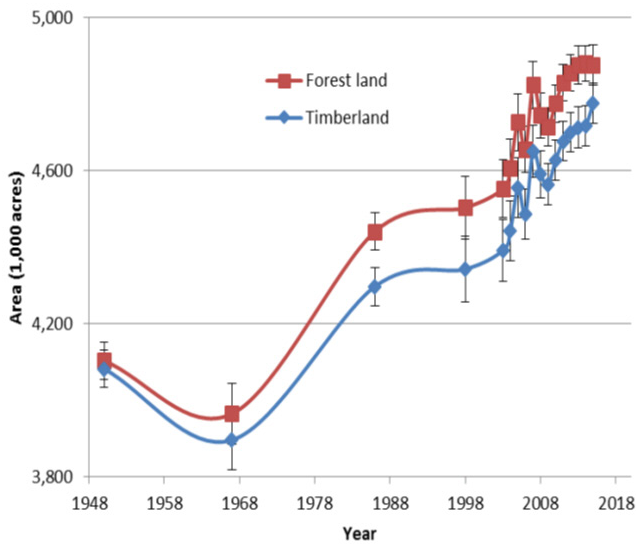


Figure 2.—Acres of forest land and timberland in Indiana by inventory year and dating from 1950 to 2015. Error bars represent 1 standard error or a 68-percent confidence interval.

Sugar maple (*Acer saccharum*) is by far the most numerous tree in Indiana with an estimated 360 million individuals; red maple (*Acer rubrum*) is second with an estimated 110 million trees in Indiana. Interestingly, the most numerous species, sugar maple, is not the most voluminous species in the State. That distinction belongs to the State tree, yellow-poplar, a.k.a. the tulip tree (*Liriodendron tulipifera*) with a net volume of nearly 1.24 billion cubic feet. These yellow-poplars also store approximately 23.5 million tons of woody biomass in their tissues.

White ash, followed by yellow-poplar, black oak, and sugar maple, had the highest mortality in Indiana for the 2015 forest inventory. Annual mortality increased by 26.0 percent between 2010 and 2015 and in 2015 was 1.3 percent of net volume, up from 1.1 percent in 2010.

Volume

Net volume (10.6 billion ft³) experienced an increase of about 6.3 percent since 2010. Yellow-poplar and sugar maple were the top two individual tree species by volume

estimates, each with more than 1 billion cubic feet. White oak, black oak, and white ash rounded out the top five, all with more than 500+ million cubic feet each.

More information on Indiana Forests is available in the [2015 FIA Annual Report](#).

Forest Products

Indiana ranks 9th nationally in total lumber production and 3rd in hardwood lumber production. Indiana forests contribute over **\$13.5 billion annually** (2012) to Indiana's economy. In 2012, Indiana's primary wood-using industry included 102 sawmills, 8 veneer mills, 1 handle plant, and 21 mills producing other products. Direct employment within the industry accounted for more than 30,800 people and indirectly, the industry supports around 60,900 jobs. Forest-based manufacturing provided \$2.9 billion in value-added [products], \$7 billion in value of shipments, and a payroll of \$1.2 billion to Indiana's economy in 2014. More than two-thirds of the 68.4 million cubic feet of industrial roundwood harvested in 2008 came from south-central and southwestern Indiana. Saw logs accounted for 90 percent of the total harvest, with other minor products—primarily veneer logs, pulpwood, handles, and cooperage—making up the rest. View more information at [Indiana Forest Product Industry: Economic Impact 2015](#).

Maple syrup is a product of Indiana's forests. In 2016, there were 143 maple syrup producers in 38 counties; most were found in the northern half of the State. Of those producers, 84 responded to a survey with 67 indicating a total production of 12,854 gallons of maple syrup, which was up from 11,829 gallons in 2016. A total of 66,430 taps produced 577,386 gallons of sugar water with an average of 48 gallons to get 1 gallon of maple syrup. The 2016 retail prices for gallon, quart, and pint were \$43.24, \$14.85, and \$8.65, respectively, all higher than 2015.

Average dollar return per tap was \$9.42. The estimated statewide income is estimated to range from \$521,214 to more than \$625,000 when calculating sales plus give-away or owner consumption. View more information about the [Indiana 2016 Maple Syrup Report](#).

State Forest Health Issues – An Overview

The **2016 growing season's major forest health problems** were the increased expansion and amount of ash mortality from emerald ash borer, the confirmation of walnut twig beetle trapped in a sawmill in Franklin County, jumping oak gall discoloration (=defoliation), and the first occurrence in Indiana of mortality to only chestnut oak in a mixed-oak forest in two counties.

The **recurring forest health issues** are gypsy moth management, oak wilt, butternut canker, emerald ash borer, white pine root decline (*Proceras* root rot), and mortality/decline in aging hardwood forests.

Future forest pests of concern not present in Indiana in 2016 included the exotic pests sudden oak death, Asian longhorned beetle, hemlock woolly adelgid, beech bark disease, gold spotted oak borer and other *Agrilus* species, and red bay wilt.

Also of concern is thousand cankers disease of black walnut, which has not been detected in a black walnut tree. The components of the disease – walnut twig beetle and *Geosmithia morbida* – have been detected in Indiana through the trapping survey and research work.

Also of concern are **invasive plants** that have the potential to affect and are affecting Indiana forest regeneration and biodiversity. Plants of concern are kudzu (*Pueraria montana*), Tree of Heaven (*Ailanthus altissima*), bush honeysuckle (*Lonicera* spp.), Japanese stiltgrass (*Microstegium vimineum*), and others. The kudzu eradication program continued to eradicate locations in Indiana.

Through 2016, there were 176 confirmed sites in 41 counties totaling 184.43 acres. The goal is to move kudzu to the Ohio River and eventually out of Indiana.

To help manage and prevent aquatic invasive plants, 28 aquatic invasive plant species are prohibited from sale, barter, trade, distribution, or transport in Indiana. The Division of Entomology & Plant Pathology is also developing a rule to prohibit or restrict 34 terrestrial invasive plant species.

Exotic Insect Pests of Indiana Forests

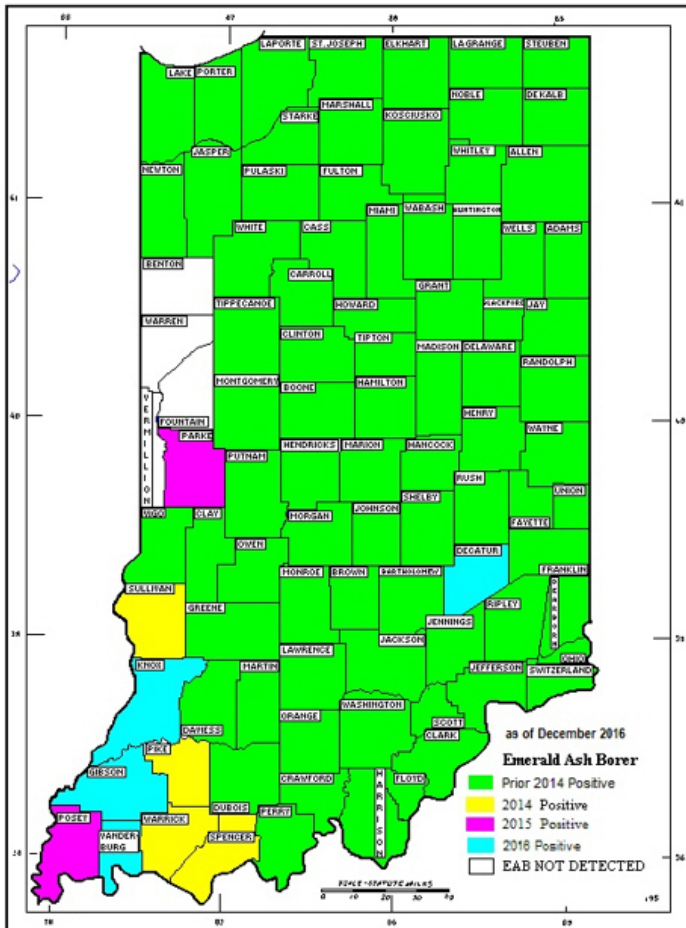
Two exotic major insects of concern – gypsy moth and emerald ash borer – continued to dominate the State's resources for monitoring and management activities. Added to this in 2016 is thousand cankers disease of walnut. In addition to these species, surveys for and awareness of other exotic invasive pests – Asian longhorned beetle, hemlock woolly adelgid, and sudden oak death – continue to impact State resources.

Emerald Ash Borer - (*Agrilus planipennis* Fairmaire)

Emerald ash borer (EAB) was discovered in northeast Indiana in June 2004.

The 2016 survey using the purple panel trap with manuka and phoebe oil lures was conducted in Vanderburgh County. Eight traps were set using 2015 survey grid points, and all were negative for EAB. However, reports from Vanderburgh County landowners detected and confirmed EAB.

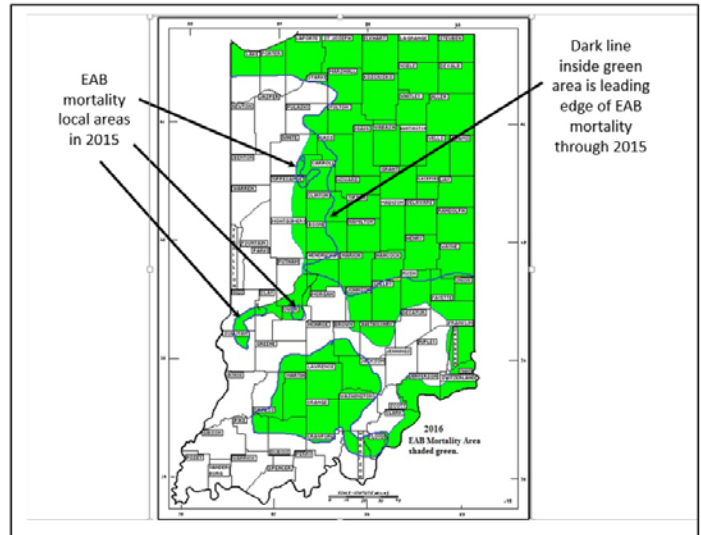
Visual surveys by Indiana Department of Natural Resources (DNR) staff also detected EAB in Decatur, Gibson, and Knox Counties for the first time. A suspect ash tree was also detected in Vermillion County in late 2016 but life stages could not be found. It is expected to be confirmed in 2017. Map 1 shows counties with positive EAB finds since 2004 and the four counties without detection of EAB as of December 2016.



Map 1.—Counties with positive EAB finds from 2004 through 2016 by year of detection: prior to 2014, 2014, 2015, and 2016, as well as the four counties with no positive detections as of December 2016.

Indiana’s EAB quarantine was repealed in October.

The aerial mortality survey mapped new locations and expansion over and around the areas that have obvious and extensive ash mortality in prior years. Map 2 shows the extent of EAB mortality through 2016 and the extent from 2015. Mortality expansion occurred in west-central Indiana converging from Terre Haute (Vigo County) east to Danville in Hendricks County. In southeast Indiana, mortality expanded southward and eastward.

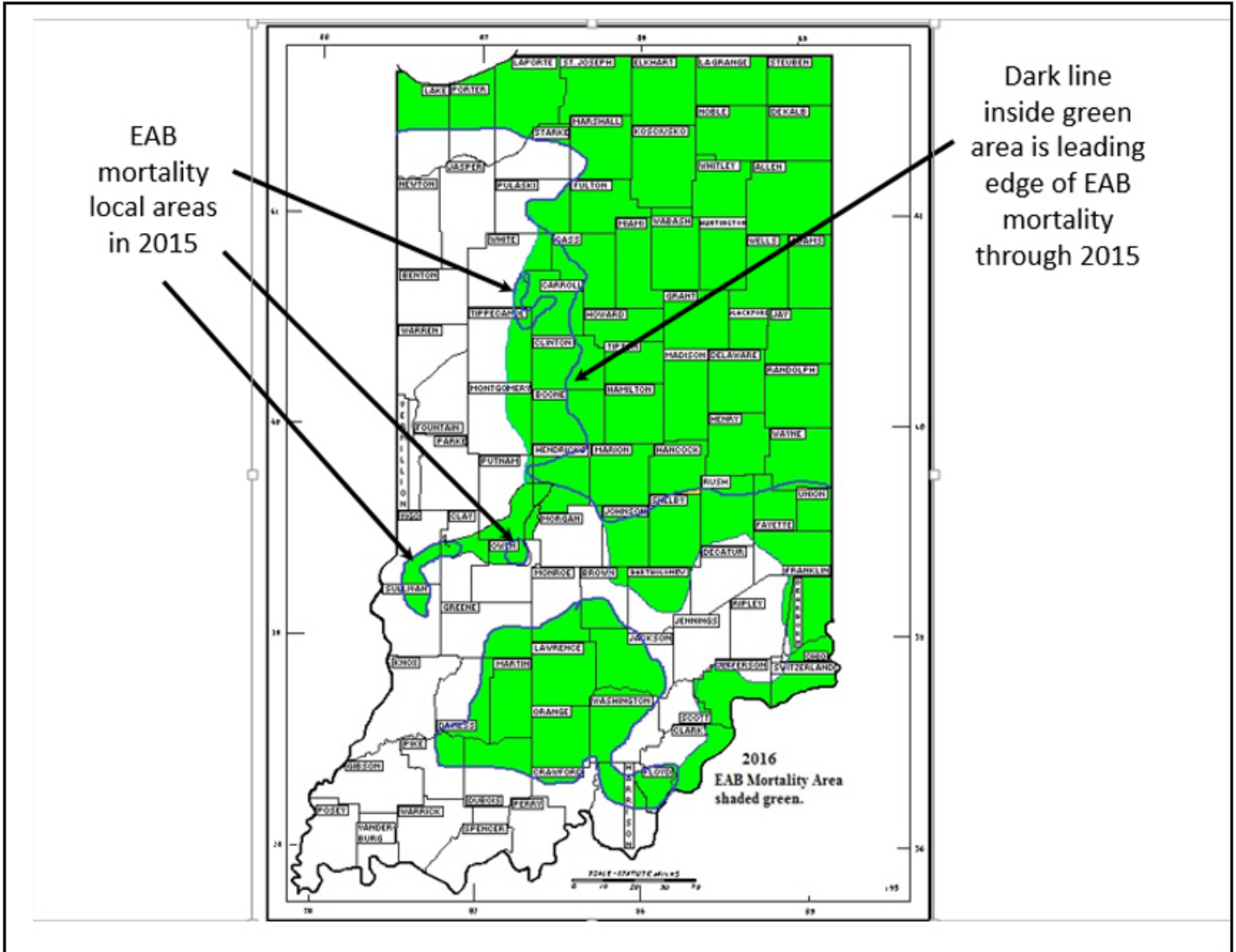


Map 2.—EAB mortality from 2004 to 2016 shaded green. The dark line inside the green shaded area indicates the extent of mortality in 2015. Area of mortality was determined through aerial survey to map woodlots or forests with any ash mortality. (Click on the map to enlarge)

The survey detected 20,863 forested acres with EAB mortality. From 2009 to 2016, a total of 152,285 forested acres have been mapped with EAB damage (dieback and mortality), and this does not include all acres.

Emerald Ash Borer Parasitoid Release Program

The Division of Entomology & Plant Pathology initiated release of four EAB parasitoids in 2016. The egg parasitoid *Oobius agrili* (figure 3) and three larval parasitoids (*Tetrastichus planipennisi* (figure 4), *Spathius galinae* (figure 5), and *S. agrili*) were received from the USDA Lab at Brighton, MI. From April through September, between 2,500 and 13,500 parasitoids were released weekly. Over this period, 77,000 *Tetrastichus*, 52,000 *Oobius*, and 5,000 *Spathius* were released at 13 sites in 5 locations – Brookville Reservoir, Crosley Fish and Wildlife Area, Hardy Lake Recreation Area, Austin Bottoms, and Atterbury Fish and Wildlife Area (Franklin, Union, Jennings, Scott, Jackson, Washington, and Johnson Counties, respectively) (map 3). Additional releases are planned for 2017 and surveys in the following years to recapture the parasitoids and determine establishment.



EAB mortality local areas in 2015

Dark line inside green area is leading edge of EAB mortality through 2015

Larger image of Map 2. [Go back to page 4 to continue reading.](#)



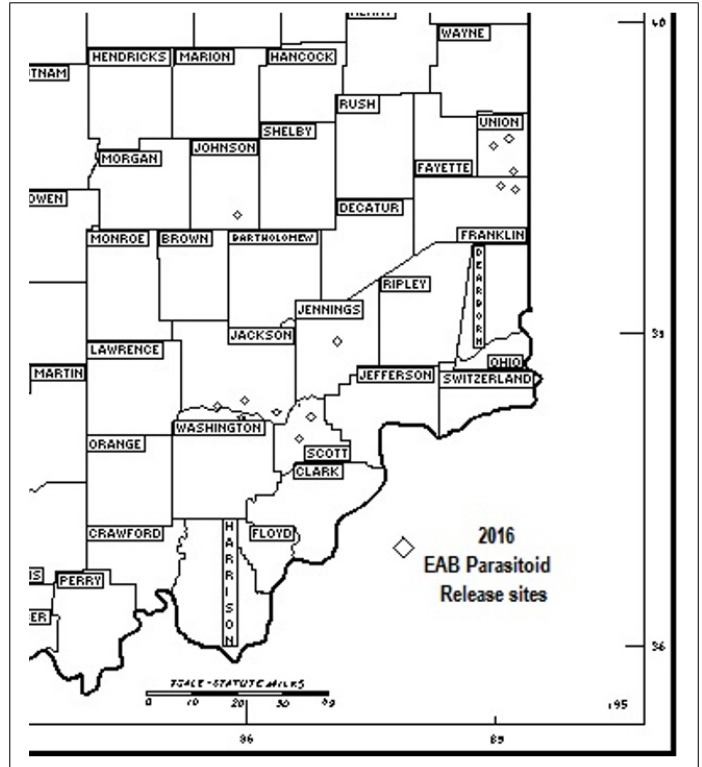
Figure 3.—*Oobius agrili*. (Courtesy photo by Houping Lui, Michigan State, Bugwood.org)



Figure 4.—*Tetrastichus planipennisi*. (Courtesy photo by David Cappaert, Bugwood.org)



Figure 5.—*Spathius* spp. (Courtesy photo by David Cappaert, Bugwood.org)



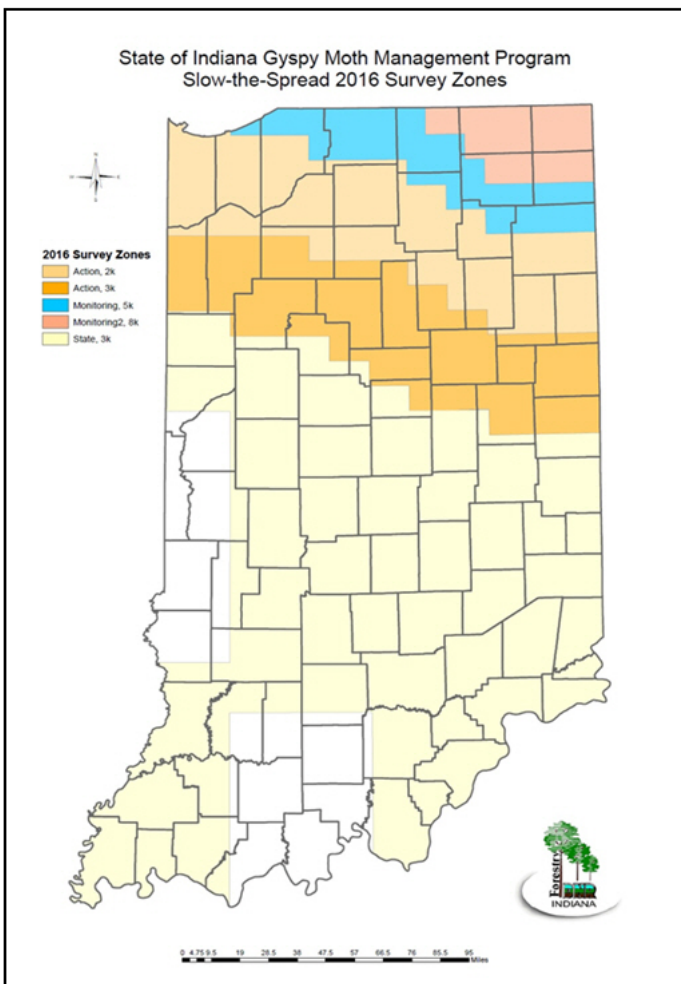
Map 3.—EAB parasitoid release sites in 2016.

(Compiled from 2016 Division of Entomology & Plant Pathology Annual Report, *Emerald Ash Borer Parasitoid Release Program* by Jared Spokowsky.)

Gypsy Moth (*Lymantria dispar*)

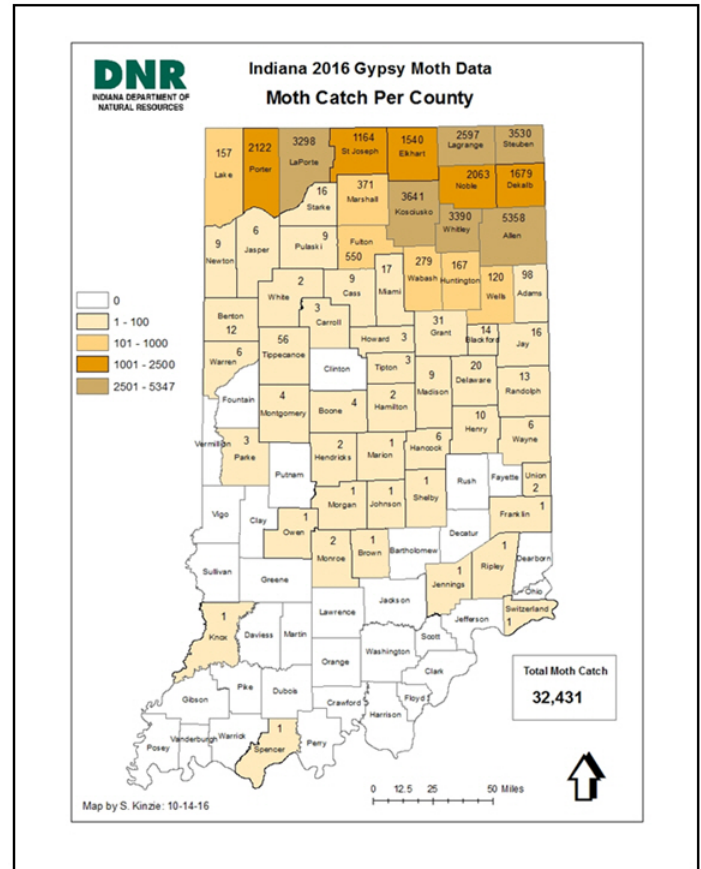
The 2016 Cooperative Gypsy Moth Survey completed its 28th year of the statewide survey. The survey is part of the Slow-The-Spread (STS) Program and uses the STS protocol for its design and operation dividing the State into three zones – STS Evaluation Zone, STS Action Zone, and the State Area (map 4).

The survey design used fixed 5K, fixed 3K, and fixed 2K for the three zones. Across all zones, the survey used 11,055 trap sites, all referenced by GPS. Six counties in the State area were not trapped this year, compared to four counties not trapped in 2015, mostly for economic reasons, but also because of negative trap catches in previous years. There are plans to survey most of these counties in 2017. [View all data on gypsy moth survey and management.](#)



Map 4.—2016 Gypsy moth survey zones. White counties were not surveyed.

The survey detected 32,431 moths from 59 counties ranging from 1 to 5,358 moths per county (map 5). This year's moth catch is 17,101 more than last year's number of 15,330. Positive traps occurred in 59 counties: 32 in the STS zones and 27 in the State Area.



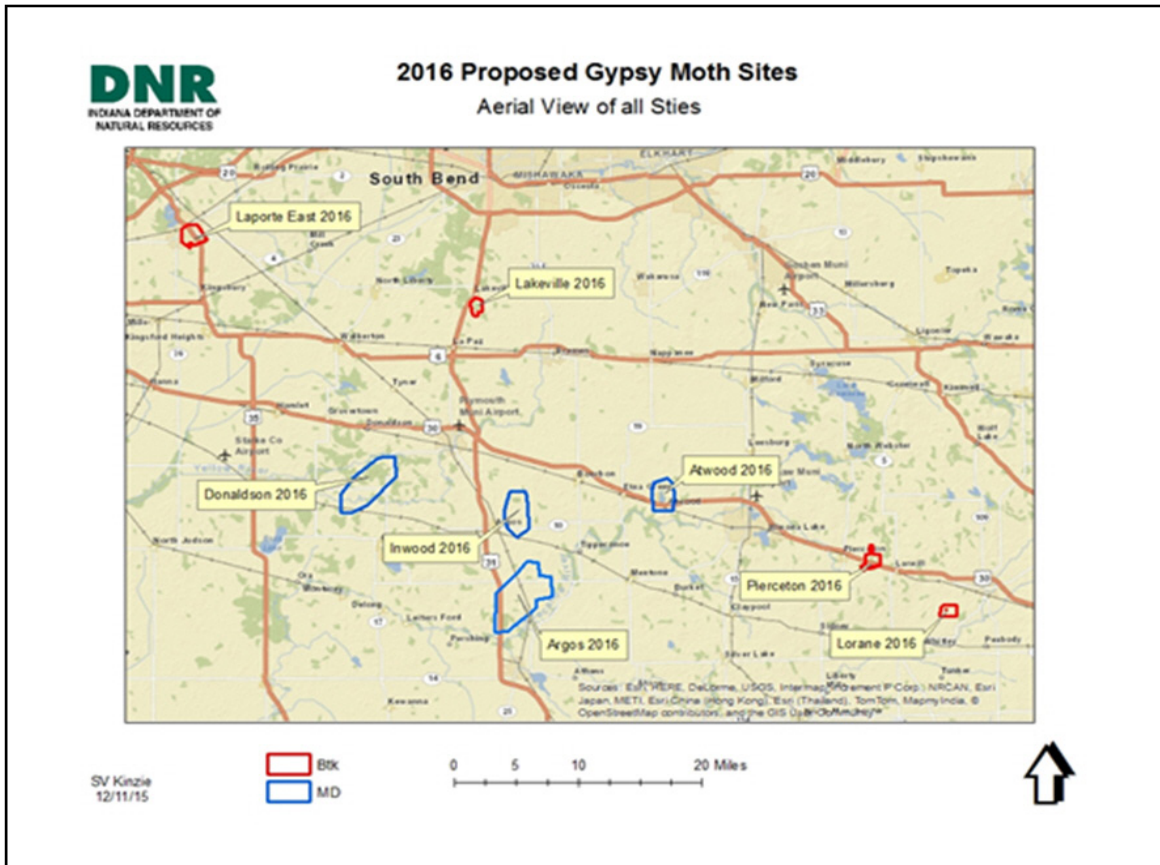
Map 5.—2016 Gypsy moth catch showing numbers of moths by county.

Since the survey began in 1972, 512,809 moths have been caught in 90 of the 92 counties. Gypsy moth has not been detected in Dubois and Sullivan Counties since surveys began in 1972.

Btk (*Bacillus thuringiensis kurstaki*):

Treatments to slow the spread and development of gypsy moth (map 5) were conducted on four sites totaling 1,089 acres in four counties. The sites were treated with Btk at 25 BIU with two applications for a total of 2,178 treated acres.

Mating Disruption: Four sites totaling 4,573 acres were treated with pheromone flakes (Disrupt II, Hercon); all four sites were treated at 6 grams (map 6).



Map 6.—2016 Gypsy moth treatment locations. Red outline is Btk treatment and blue outline is Mating Disruption treatment.

The 2014 eradication treatment at Purdue University has not achieved eradication. The 2016 delimit survey detected 46 moths in and around the 2014 treatment site compared to 5 moths in 2015.

Potential problem areas from the 2016 survey were evaluated in November. There are 10 sites proposed for treatment in 2017 in Fulton, Kosciusko, Marshall, Miami, Porter, Tippecanoe, Wabash, and Whitley Counties. The Tippecanoe site is the eradication site at Purdue University. The others sites are in the STS Action Zone. Sites are proposed for treatment with Btk, mating disruption, or both, possibly with Mimic following evaluation of the sites.

Aerial surveys detected two areas of noticeable defoliation (96 acres) in Porter County. Other reports of defoliation in LaPorte, Porter, and Allen Counties were not detectable by aerial survey as they were very light and only visible from the ground. The last time surveys detected defoliation from gypsy moth was in 2009 when 70 acres of defoliation occurred in two counties.

There are nine counties along the northern border under State and Federal gypsy moth quarantine (map 7).

Eight traps were placed in a delimit survey at the walnut plantation in Yellowwood State Forest. WTB was not detected and has not been detected at the plantation since first report of *G. morbida* on a weevil collected was study trees at the plantation.

One WTB was collected September 3, 2015, and confirmed June 23, 2016, from one trap at Danzer Veneer Mill log yard in Johnson County. The sample was not able to be tested for *G. morbida*. 2016 traps did not detect WTB at the mill. This is the third location where a component of TCD has been detected in Indiana.

Thousand cankers disease (TCD) trapping and windshield surveys continued in 2016. The trapping survey continued at 129 high-risk sites and 10 sites along the Ohio border adjacent to Butler County (map 8). WTB was not detected in these traps.

The windshield survey was conducted in 12 cities — Brookville Heights/New Palestine, Frankfort, Huntington, Liberty, Milan, Mitchell, New London/Russiaville, North Judson, Petersburg, Seymour, and the northern half of Warsaw. A total of 1,423 trees were surveyed finding 44 as suspect to be reevaluated over time. Since this survey began in 2012, 5,054 trees have been evaluated in 49 municipalities and TCD has not been detected.

The 2016 visual survey continued using gypsy moth trap tenders who viewed and reported 808 black walnut trees from across the State as they monitored gypsy moth traps. They identified 37 trees that had suspicious symptoms, which were checked by inspectors and found negative, but will be monitored in the future.

A TCD study in the Yellowwood plantation by Jenny Juzwik, U.S. Forest Service Research Pathologist, and Matt Ginzler, Purdue Forest Entomologist, involves inoculating black

walnut branches with *G. morbida* and other fungi cultured from black walnut branches in the 2014 study to understand the role of all fungi in canker development. This also repeats the stressed tree study to determine what insects come to these trees and if they carry *G. morbida*. All results of the study will be available in 2017. No walnut trees in the plantation are symptomatic and/or dying from TCD.

Current Indiana TCD facts:

- Thousand cankers disease of black walnut has NOT BEEN DETECTED AND CONFIRMED from a walnut tree in Indiana.
- There is NO mortality of black walnut trees from thousand cankers disease occurring in Indiana.

Secondary Exotic Insect Pests of Concern

Pine Shoot Beetle (PSB) (*Tomicus piniperda*) Indiana's PSB quarantine was repealed in October. There is no survey for PSB and no damage to the conifer hosts. PSB is no longer a pest of concern for Indiana.

Hemlock Woolly Adelgid (*Adelges tsugae*) Hemlock woolly adelgid (HWA) was detected in LaPorte County in 2012. Survey of the detection site and surrounding area in 2016 did not detect HWA.

Asian Longhorned Beetle (ALB) (*Anoplophora glabripennis*) No organized trapping survey was conducted in 2016. Through Farm Bill Funding – Forest Pest Outreach and Survey Project – resource personnel and the public were trained to recognize and report ALB suspect trees. No reports were received from trained volunteers or from the public. ALB does not occur in Indiana.

Plant Pathogens of Concern

Chestnut Oak Mortality (*Armillaria mellea*, *Agilus bilineatus*, *Hypoxylon Canker* (*Biscogniauxia atropunctata*), *Phytophthora cinnamomi*, and Possibly 2012 Drought)

The chestnut oak mortality reported on Patoka Reservoir (Dubois County) is the first occurrence in the past 40 years of only chestnut oak dying while associated white, red, and scarlet oak trees are not dying. Another concern for this disease situation is that the mortality is NOT occurring to seedling and sapling chestnut oak in and under the dead overstory chestnut oak.

The chestnut oak occur mid slope and were not expected to be growing in this type of location and almost in a monoculture situation. The site is considered a good growing site for trees and thus this type of mortality is not expected.

The mortality covers 9 acres with a 3- to 4-acre core area of chestnut oak monoculture with trees that died over the past 3-4 years and actively dying trees (figure 6). Around this area, scattered chestnut oak mixed with other oaks are dying.

The mortality was reported at the end of July as possibly oak wilt based on symptoms. On inspection, oak wilt was initially ruled out because it was chestnut oak, which is in the white oak group, which do not die from oak wilt even though they might be infected. Samples submitted to the Purdue Plant Pest Diagnostic Lab were negative for oak wilt.

Revisits to the site in August and September to inventory the chestnut oak trees and aerial photo survey of the site found the symptoms progressing rapidly through the chestnut oak. On those visits, *Armillaria* root rot, two-lined chestnut borer, and *Hypoxylon* canker were found but at a level of occurrence not sufficient to match symptoms of rapid progression. *Phytophthora cinnamomi* was

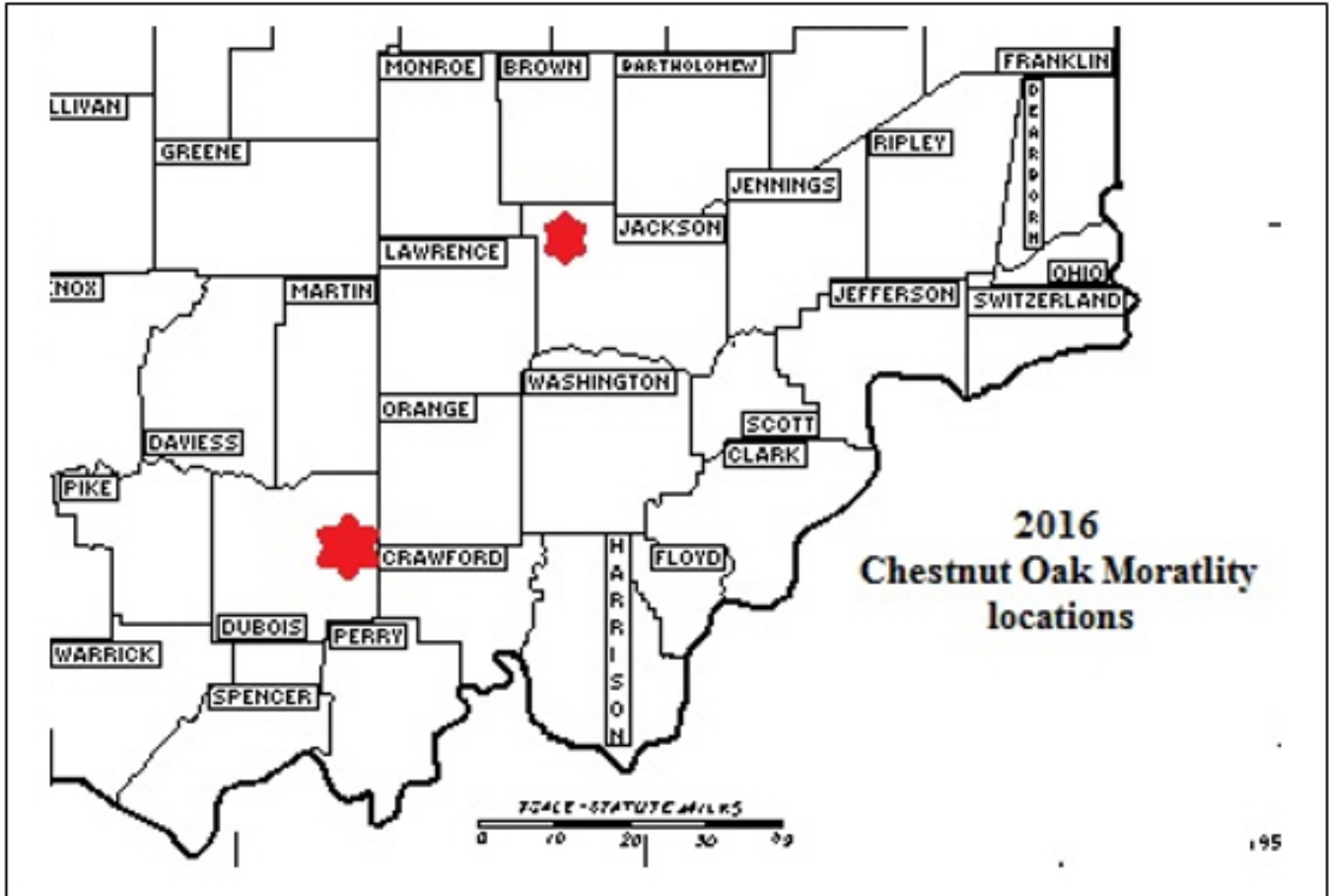


Figure 6.—Dead and dying chestnut oak trees.

identified from the root of one red top wilted tree.

The rapid mortality observed gave concern that the mortality is from a new disease agent or disease complex and thus a risk to chestnut oak and all oak in Indiana.

Then, added to the Patoka Reservoir location, a second location of only chestnut oak mortality was reported in December in Jackson County (map 9), again adding to concern about a new disease agent.



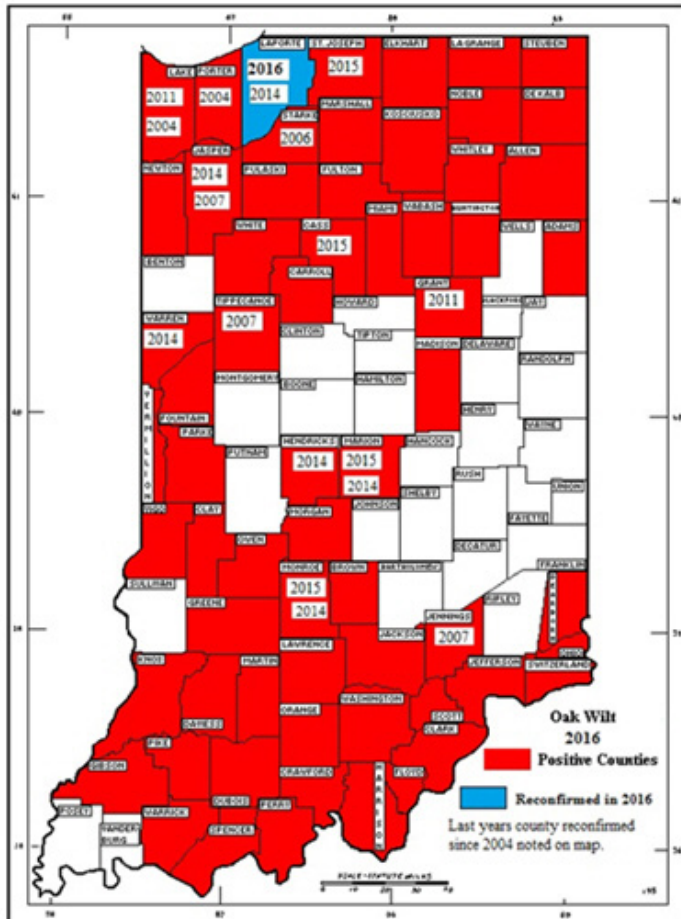
Map 9.—Indiana chestnut oak mortality locations in 2016.

With the pests detected to date, the problem appears similar to typical oak decline based on the standing dead trees that died 3-4 years ago, which would associate the mortality with the 2012 drought. The concern that it is not typical oak decline is that it just involves chestnut oak; the associated red oak group trees and white oak are not symptomatic and dying. A second concern is that seedling and sapling chestnut oak amongst the dead chestnut oak are not symptomatic and dying. Third, the rapid progression of symptoms in one year (2016) after the problem has been there for 3-4 years questions the oak decline cause and raises the question about the role of *Phytophthora cinnamomi* in rapid disease progression in one growing season. Fourth, Armillaria root rot and two-lined chestnut borer do not appear to have a major role in the rapid progression of symptoms or dying.

Additional root sampling and monitoring at Patoka Reservoir is planned for 2017. The Jackson County site and others sites reported by foresters will be surveyed. A more intensive aerial survey over the State and national forest area to detect other mortality locations is planned for summer 2017.

Oak Wilt (*Ceratocystis fagacearum*)

No new county detections occurred in 2016. Oak wilt was reconfirmed by the Purdue Plant Diagnostic Lab (culture confirmation) in LaPorte County. Oak wilt has been detected in 64 counties (map 10).



Map 10.— Indiana counties that were positive for oak wilt in 2016 (red) and reconfirmed in 2016 (blue).

Oak wilt continues to be a problem in the woodlots of northwestern Indiana in the Kankakee River basin. Mortality of black and red oak continued in 2016 and may be slowing because of the wet summer, which may have helped prevent mortality. There were fewer inquiries in 2016 and no widespread occurrence detected during aerial survey.

Dogwood Anthracnose (*Discula destructiva*)

Surveys were not conducted in 2016. This disease has been a reduced concern over the last 10 years because of its slow removal of trees. Even with the wet spring and summer in 2016, there were no reports of dogwood dying, even though the disease is present in the State.

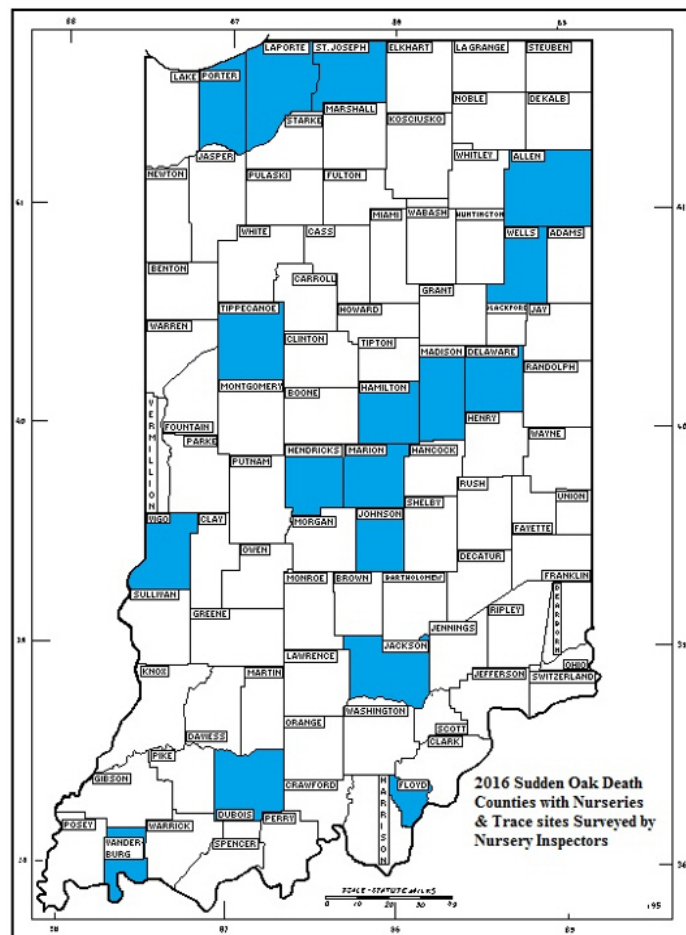
However, dogwood may slowly be removed from the forest if Continuous Forest Inventory plots on State Forests are an indication. From 2012 to 2015, the data shows the number of dogwood 5-9" d.b.h. has declined by 28.6 percent. The reason for tree death is not indicated in the data. There is also no data on trees <5" d.b.h. So, dogwood anthracnose may or may not be involved.

Ailanthus Wilt (*Verticillium nonalfalfae*)

One report of Tree of Heaven, *Ailanthus altissima*, wilting from Fayette County was investigated in the effort to culture this fungus, but it was not successful. Another attempt from the site in Noble County was also not successful in culturing the fungus. A tree that is wilting from this fungus will have a golden color to the sapwood surface. Wilting is likely to be seen in mid- to late July; trees need to be sampled when the tree is wilting to culture the fungus. The fungus has the possibility of being a biocontrol.

Sudden Oak Death (*Phytophthora ramorum*)

The Division of Entomology & Plant Pathology continued the annual sudden oak death (SOD) survey. Twenty-one separate locations were survived in 16 counties (map 11). A total of 397 samples were collected with 81 of those testing positive for *Phytophthora* spp. None of those tested positive for *P. ramorum*. One trace forward site (Tippecanoe County) was surveyed with two samples positive for *Phytophthora* spp. and negative for *P. ramorum*.



Map 11.—2016 Indiana sudden oak death counties with nurseries and trace sites surveyed by nursery inspectors.

SOD has only been confirmed twice – at a nursery in Lake County in 2006 and at a garden center in St. Joseph County in 2012. SOD has not been detected at or around them since initial detection.

Dutch Elm Disease (*Ophiostoma ulmi* (syn. *Ceratocystis ulmi*))

This disease continued to kill American elm in urban and rural forests. The amount of mortality has lessened across the State over the last few years.

Butternut Canker (*Sirococcus clavignenti-juglandacearum*)

As in prior years, no surveys were conducted in 2016 because the disease is present throughout the State. The Hardwood Tree Improvement Cooperative at Purdue University continues to locate and collect plant material from butternut trees for a breeding program to save the species.

Beech Bark Disease (Disease complex of *Cryptococcus fagisuga* Lind and *Nectria coccinea* var. *faginata* Lohman)

No surveys for this disease were conducted in 2016. No reports of trees with the scale or canker and no beech mortality were received. To date this disease is not present in Indiana and is expected to first occur in northern Indiana because of its presence along Lake Michigan in the Lower Peninsula of Michigan. The concern is the possibility that infected/infested material (firewood) is brought into Indiana.

Redbay Wilt (*Raffaelea lauricola*) and Redbay Ambrosia Beetle (*Xyleborus glabratus*)

This forest pest complex is not known to be present in Indiana. No surveys were conducted in 2016 and no reports of dying sassafras or spicebush were received.

Native Insect and Disease Concerns

Jumping Oak Gall (*Neuroterus* spp.)

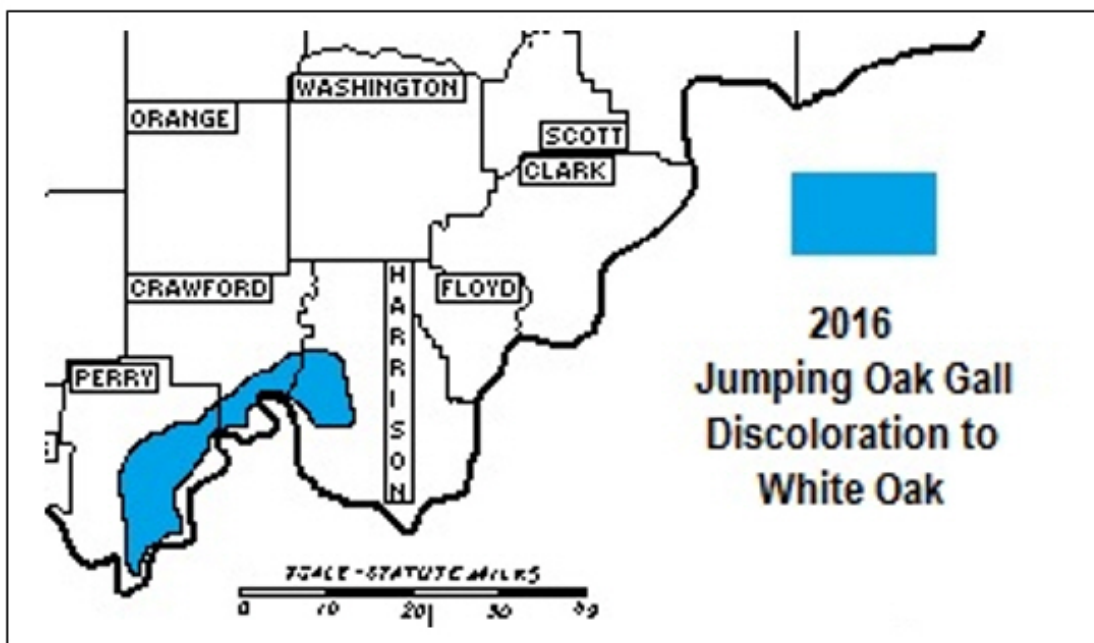
Jumping oak gall is a small wasp that creates tiny round galls on the underside of white oak leaves (figure 7). When the leaf is heavily galled, it turns a brown color starting in May and June.



Figure 7.—Signs of jumping oak gall wasp on a leaf.

The discoloration is similar to a defoliation because it interferes with the leaves' ability to produce food for the tree, which can result in tree stress.

The brown discoloration of white oak returned in 2016 to more than 12,400 forest acres of Crawford, Harrison, and Perry Counties primarily on the Hoosier National Forest and Harrison-Crawford State Forest (map 12). The discoloration is considered to be at light to moderate levels, which may not result in serious stress to the white oak.



Map 12.—Location of 2016 jumping oak gall discoloration of white oak in Indiana.

Treatment of kudzu by Indiana Department of Natural Resources Division of Entomology & Plant Pathology (IDNR-DEPP) began in 2006 and has continued annually to remove kudzu from Indiana. In 2016, herbicide applications were conducted at 76 kudzu sites in 27 counties. A total of 72.65 acres were treated by IDNR-DEPP staff and contractors by September 30, 2016.

The average treatment cost is \$1,114.79 per acre per application. The average cost of erosion work is \$2,803 per acre.

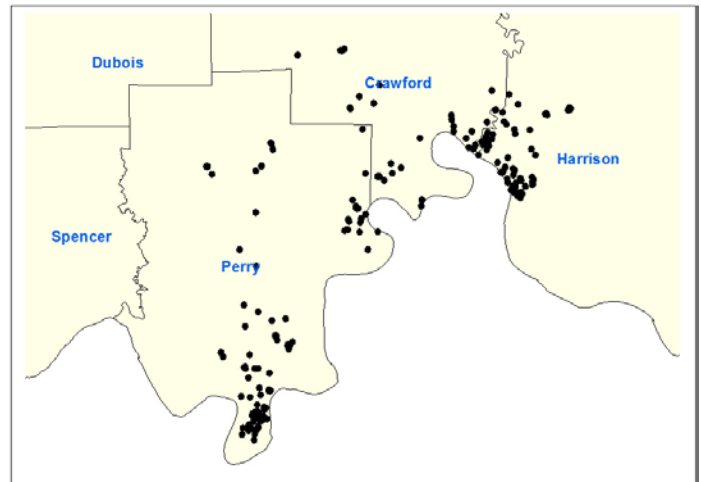
(Compiled from 2016 Division of Entomology & Plant Pathology Annual Report, Kudzu Eradication Project report by Ken Cote)

Ailanthus Survey – Good Neighbor Grant/Hoosier National Forest

Through a Good Neighbor Grant from the Hoosier National Forest, aerial surveys were conducted in July to detect the trees by their flowers and in December from the seeds clinging to the tree. Both surveys were successful at detecting Tree of Heaven on the Hoosier National Forest; Harrison-Crawford State Forest; and other lands in Perry, Crawford, and Harrison Counties.

The survey identified 257 locations, 146 in the Hoosier National Forest in Perry and Crawford Counties and 109 locations on and around Harrison-Crawford State Forest (map 14). The July survey detected 100 of the locations by

flower or foliage. Each location was estimated to range from 1 to more than 30 trees. Ten areas totaling ~400 acres were mapped as each area had extensive occurrence of Tree of Heaven.



Map 14.—Tree of Heaven locations in Crawford, Harrison, and Perry Counties.

Two areas on the Hoosier National Forest totaled 30 acres, and 8 areas on Harrison-Crawford State Forest totaled 370 acres.

The Hoosier National Forest and Harrison-Crawford State Forest staffs will use the survey data to help locate the trees on the ground and plan eradication treatment.

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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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