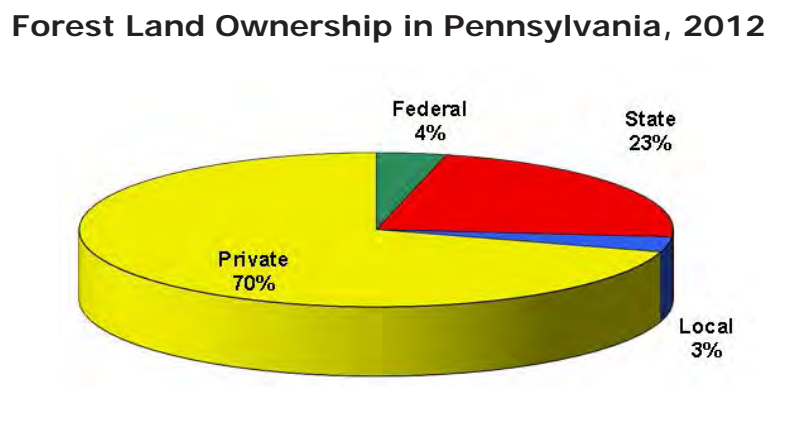
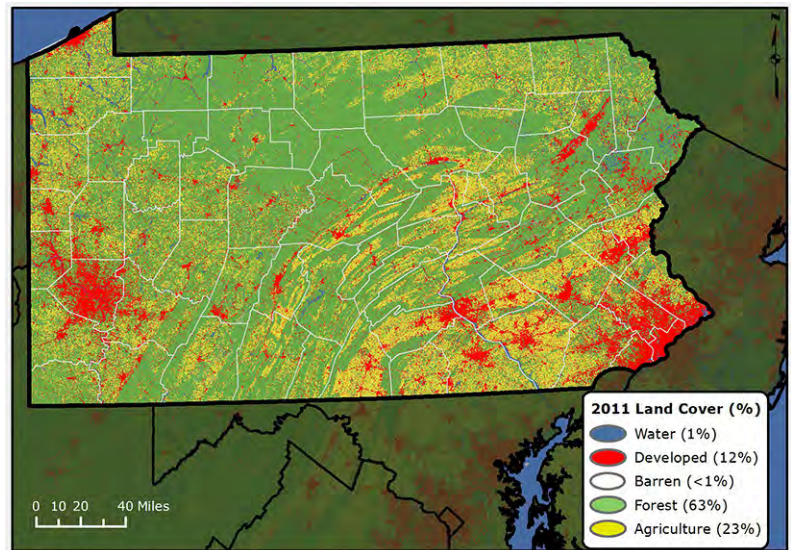




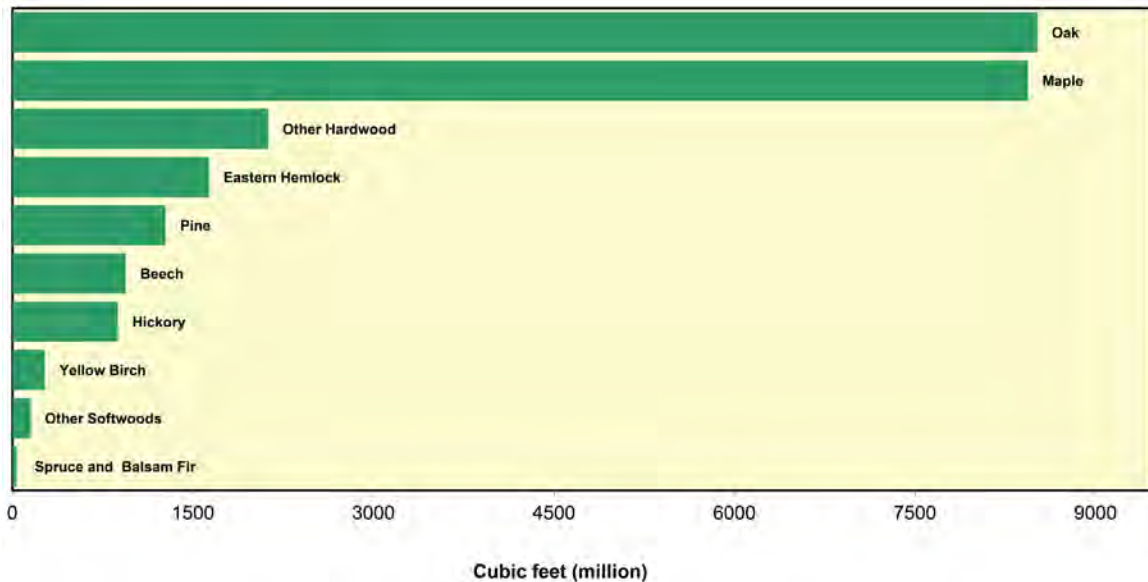
# 2017 Forest Health PENNSYLVANIA highlights

## Forest Resource Summary

Pennsylvania covers a land area of 25,333 square miles and is 63 percent forested. Seventy percent of the forest land in the Commonwealth is privately owned by 750,000 landowners. Yet in a population of 12 million people, forest landowners account for only 6.25 percent of the total population. Forests provide timber, watershed protection, wildlife habitat, and recreational benefits for all Pennsylvanians.

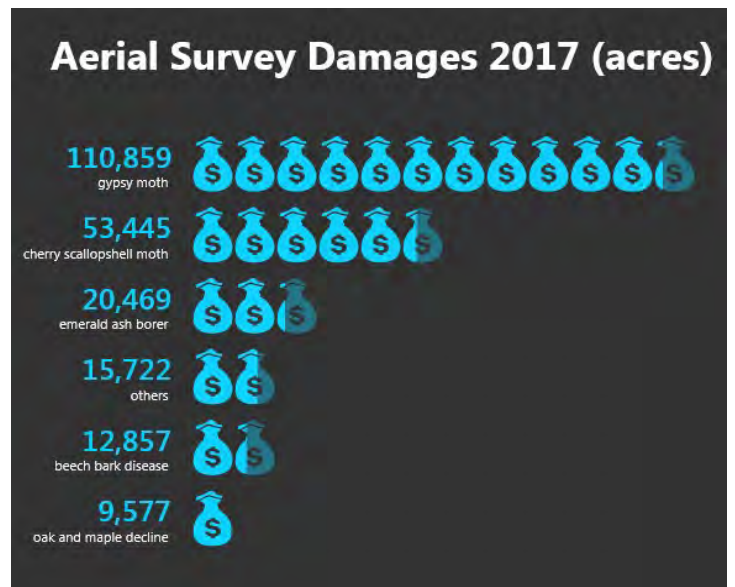


## Net Volume of Growing Stock on Timberland by Species in Pennsylvania, 2012

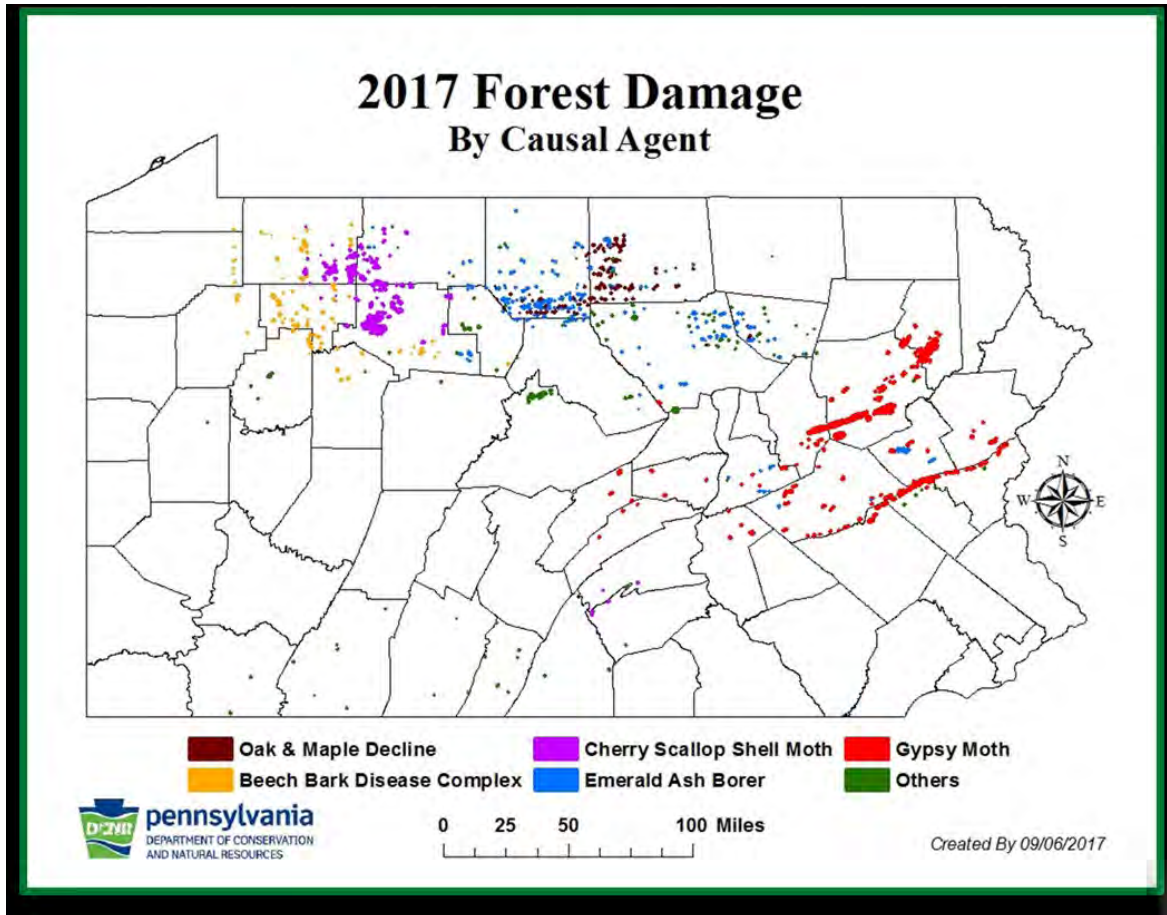


## Forest Health Surveys

Pennsylvania used aerial surveys to gauge the health of its forests. Approximately 14.5 million acres were flown in 2017, with 74% of the damage reported attributed to gypsy moth and cherry scallop shell moth. Damage from emerald ash borer, other damaging agents, beech bark disease, and oak/maple decline make up the remaining 26% of the survey. The "others" category included damage from anthracnose, hail, hemlock woolly adelgid, herbicide, locust leafminer, Cytospora canker of Norway spruce, oak wilt, tornadoes, and unknown.



Acreage of damage recorded in 2017 via aerial survey. (Graphic courtesy of PA DCNR)



Pennsylvania forest damage in 2017. (Map courtesy of PA DCNR)

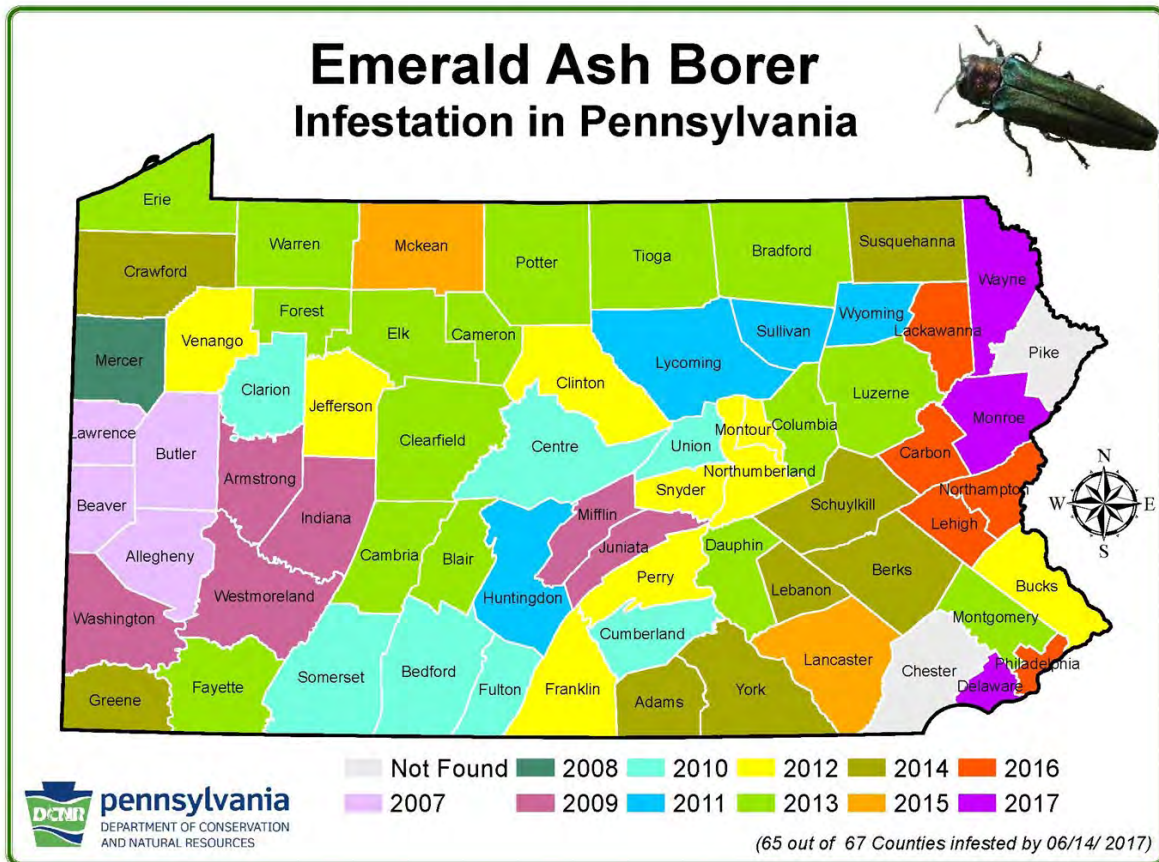
## Hemlock Woolly Adelgid

The hemlock woolly adelgid suppression project continues. Approximately 422 trees (representing 5,300 inches d.b.h.) were treated with dinotefuran in the spring. Fall insecticide treatments are currently in process at the writing of this report, with nearly 8,000 trees (representing 90,000 inches d.b.h.) planned for treatment with either imidacloprid or dinotefuran applications. There were no biological control agents released this year, but we continue to monitor sites where releases have taken place in past years; we do plan to release additional agents in the future. We continue to monitor a potentially hemlock woolly adelgid-resistant test plot of hemlocks in Tiadaghton State Forest District from trees provided to us by the U.S. Forest Service and researchers at the University of Rhode Island.

## Emerald Ash Borer

There are only two counties left in Pennsylvania that aren't confirmed as having emerald ash borer: Pike and Chester. There were 191 additional ash trees treated with emamectin benzoate in 2017. In attempts to establish a successful biological control program for emerald ash borer, parasitoid releases (all wasps) have been conducted since 2011. In 2017 we released 308 *Spathius agrilli*, 14,732 *Oobius agrilli*, 1,915 *Spathius galinae*, and 25,194 *Tetrastichus planipennisi*. Newtown Township was added to our emerald ash borer management community grants, bringing the total number of communities in the program to eight. Participating communities are Philadelphia, Lancaster, State College Borough, Pottsville, Easton, Reading, Lewisburg, and Newtown Township.

# Emerald Ash Borer Infestation in Pennsylvania



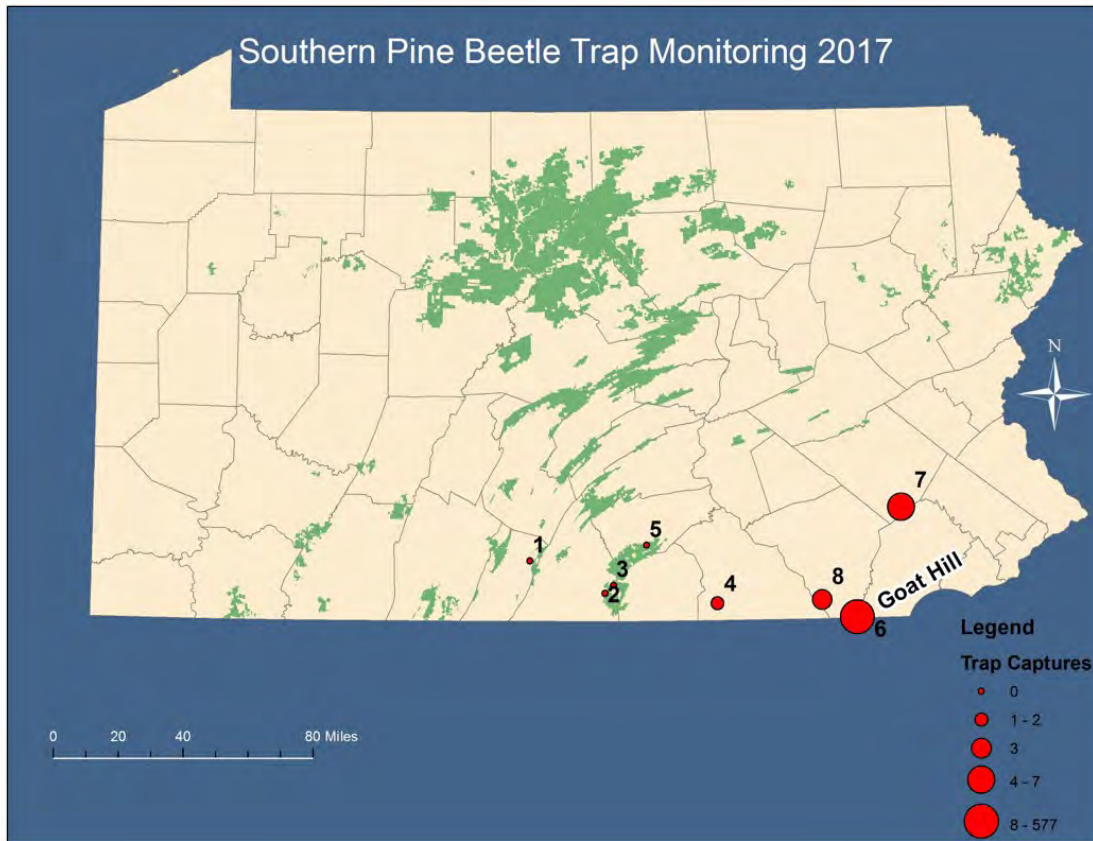
Emerald ash borer infestation history in Pennsylvania. (Map courtesy of PA DCNR)

## Southern Pine Beetle

This year we set up traps to monitor southern pine beetle (*Dendroctonus frontalis*) populations. We installed eight sites and checked them weekly from early April to early June. Four of the eight sites did capture southern pine beetles, but 97% of all captures (577 beetles) were from a site in Chester County named Goat Hill. The accompanying photo shows recent southern pine beetle damage at Nottingham County Park, which is close to the Goat Hill site.



Pine trees damaged by southern pine beetle in Nottingham County Park, Chester County. (Courtesy photo by PA DCNR)



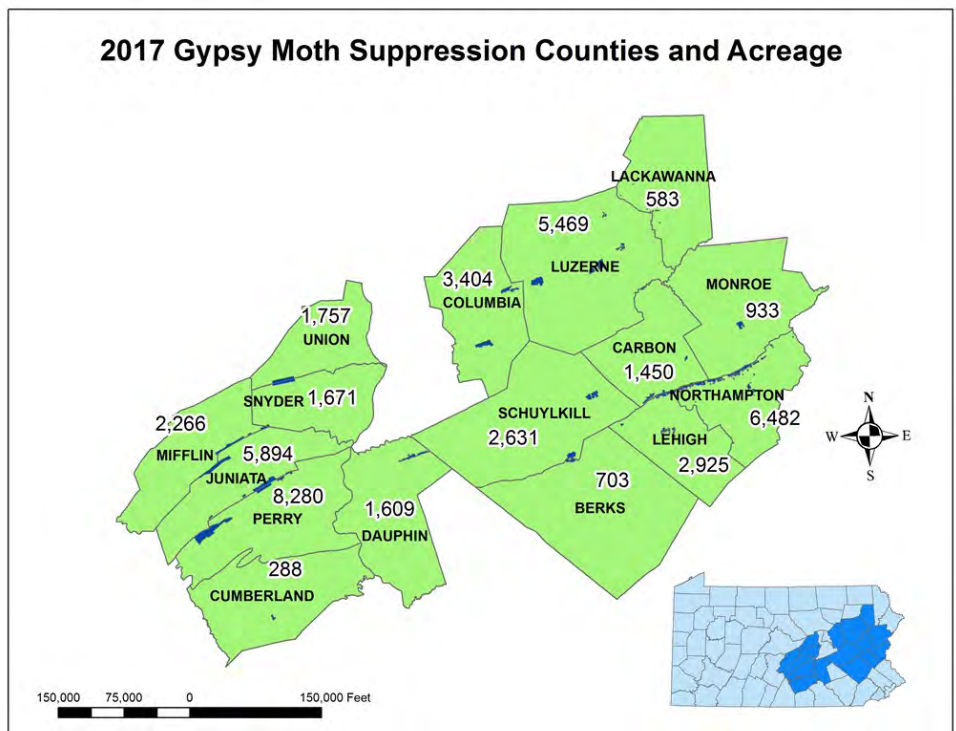
Pennsylvania southern pine beetle trap monitoring in 2017. (Map courtesy of PA DCNR)

## Gypsy Moth

The gypsy moth suppression program was substantially less than the previous year's program. Aerial applications were conducted within 16 counties. A total of 46,345 acres were treated with either *Bacillus thuringiensis* var. *kurstaki* (Btk) or tebufenozide (Mimic® 2LV).

## White Pine Needlecasts

Moisture trends from 2012–2017 have been above normal in many areas of the Commonwealth and have contributed to an increase in several pathogens, including needlecasts. White pine needlecasts continue to be



Gypsy moth suppression and acreage in Pennsylvania counties in 2017. (Map courtesy of PA DCNR)

observed, notably in central and south-central regions of the State. Brown spot needlecast (*Lecanosticta acicola*) and grey (*Canavirgella*) needlecast (*Lophophacidium dooksii*) are prevalent on white pine. *Septorioides strobi* needlecast is not as common as it was in 2016 but can still be found in low to moderate levels. Grey (*Canavirgella*) needlecast was the most common of the three in 2017.

## Pitch Canker

Pitch canker (*Fusarium circinatum*) was observed this year on pitch pine on high-elevation sites on Mount Davis (Forbes State Forest). This is the only known site in Pennsylvania to date, but this is a serious pathogen of which to be aware.

## Other Notable White Pine Observations

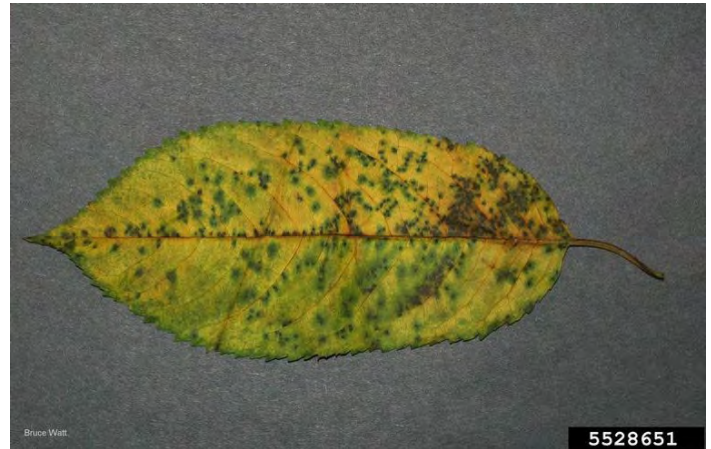
Pine needle scale (*Chionaspis pinifoliae*) was encountered frequently on white pine, but at lower levels than in previous years; pine bark adelgid (*Pineus strobi*) was also less prevalent in 2017. *Diplodia pinea* tip blight was observed on Scotch pine, red pine, and black pine, with lesser amounts on white pine. *Elytroderma deformans* tip blight was prevalent on white pine in the understory, but caused little damage.

## Anthracnose

High moisture and precipitation levels have led to an increase of anthracnose (a fungal pathogen). Damage has been observed on oak, maple, beech, birch, sycamore, and sugar maple, and to a lesser extent on red maple. This has been observed throughout the growth period and is leading to early leaf drop on sugar maple and some red maple.

## Cherry Leaf Spot

Cherry leaf spot (*Blumeriella jaapii*), a fungal pathogen, has become prevalent on black cherry seedling regeneration and is causing significant regeneration failures in northern hardwood forests.



Leaf infected with cherry leaf spot. (Courtesy photo by Bruce Watt, University of Maine, Bugwood.org)

## Oak Wilt

Oak wilt (*Ceratocystis fagacearum*) has been confirmed in many counties. We have observed an uptick in oak wilt activity throughout its known range in Pennsylvania. It's increasingly likely that oak wilt is now occurring in Elk, Lycoming, and Potter Counties in addition to the pre-2016 counties identified.



Oak wilt infestations in Pennsylvania. (Map courtesy of PA DCNR)



## Spotted Lanternfly

Spotted lanternfly (*Lycorma delicatula*) is a new invasive insect found in Berks County in 2014. The insect is native to northern China and now occurs in several other countries in Asia as well. While spotted lanternfly must feed on tree of heaven (*Ailanthus altissima*) during its life cycle, in North America it also feeds on wine grapes, wild grapes, sweet birch, and big-tooth aspen; it has also recently been found feeding on hops and black walnut. Its eggs can be found on trees, shrubs, building structures, fence posts, and rocks, among other surfaces. They can be somewhat hard to spot because they are being mistaken for lichens or mud. The known infested counties for spotted lanternfly are Berks, Northampton, Lehigh, Bucks, Montgomery, and Chester. The Pennsylvania Department of Agriculture is the main agency managing this pest; much more information can be found at their [website](#).



Spotted lanternflies walk on a tree trunk. (Courtesy photo by PA DCNR)



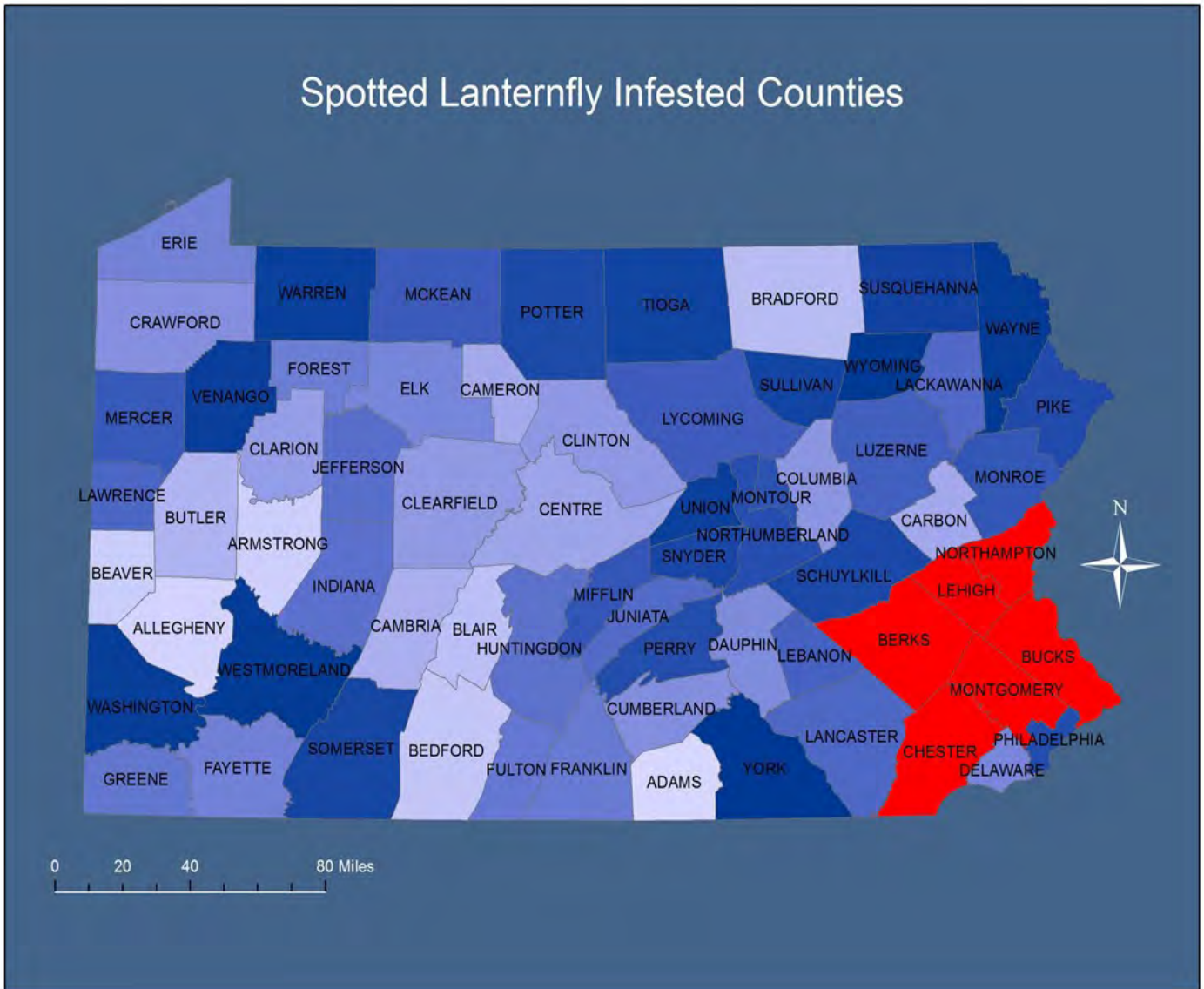
Spotted lanternflies on a tree of heaven branch. (Courtesy photo by PA DCNR)



Closeup of spotted lanternfly egg masses on a tree trunk. (Courtesy photo by PA DCNR)



## Spotted Lanternfly Infested Counties



*Pennsylvania counties infested with spotted lanternfly. (Map courtesy of PA DCNR)*

## References

### Land Cover Map:

Jin, S.; Yang, L.; Danielson, P.; Homer, C.; Fry, J.; Xian, G. 2013. A comprehensive change detection method for updating the National Land Cover Database to circa 2011. *Remote Sensing of Environment*, 132: 159 – 175.

<http://www.sciencedirect.com/science/article/pii/S0034425713000242>. (1 March 2016).

### Forest Land Ownership:

Oswalt, Sonja N.; Smith, W. Brad; Miles, Patrick D.; Pugh, Scott A. 2014. Forest resources of the United States, 2012: a technical document supporting the Forest Service update of the 2010 RPA Assessment. Gen. Tech. Rep. WO-91. Washington, DC: U.S. Department of Agriculture, Forest Service, Washington Office. Table 2.

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

### Net Volume of Growing Stock on Timberland by Species:

Oswalt, Sonja N.; Smith, W. Brad; Miles, Patrick D.; Pugh, Scott A. 2014. Forest resources of the United States, 2012: a technical document supporting the Forest Service update of the 2010 RPA Assessment. Gen. Tech. Rep. WO-91. Washington, DC: U.S. Department of Agriculture, Forest Service, Washington Office. Tables 23 & 24.

[http://www.fs.fed.us/sites/default/files/media/types/publication/field\\_pdf/GTR-WO-91.pdf](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.

U.S. Department of Agriculture  
Forest Service  
Northeastern Area  
State and Private Forestry  
11 Campus Blvd., Suite 200  
Newtown Square, PA 19073  
<https://www.fs.usda.gov/naspf/>

Forest Health Protection  
Northeastern Area  
State and Private Forestry  
180 Canfield Street  
Morgantown, WV 26505  
304-285-1545

Pennsylvania Department of Conservation and  
Natural Resources, Bureau of Forestry  
Division of Forest Health  
400 Market Street, 6th Floor  
PO Box 8552  
Harrisburg, PA 17105-8552  
717-783-2066  
<http://www.dcnr.state.pa.us/forestry/index.aspx>