

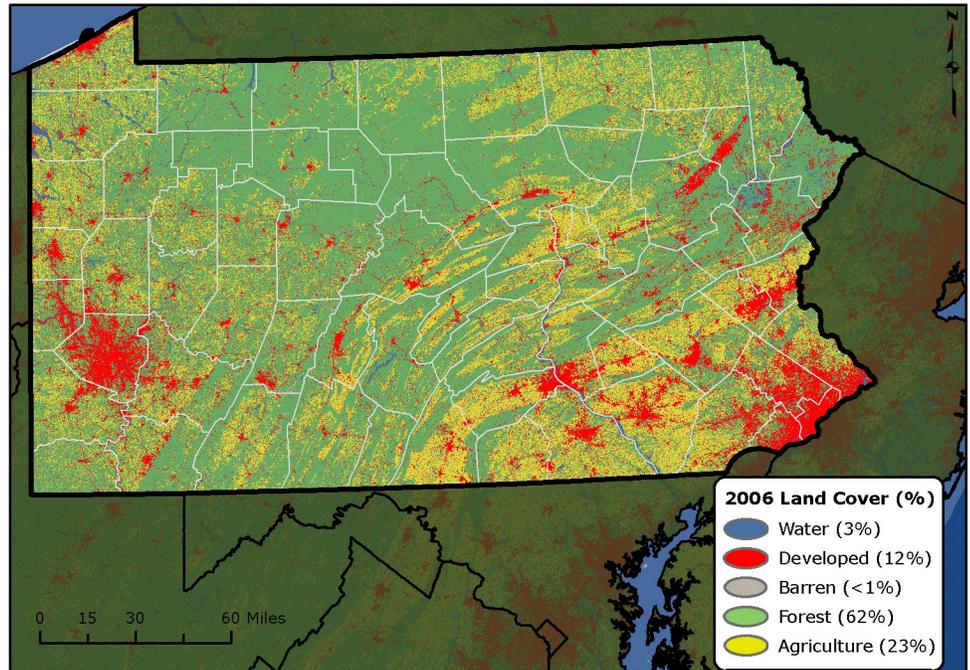
# 2013 Forest Health

## PENNSYLVANIA *highlights*

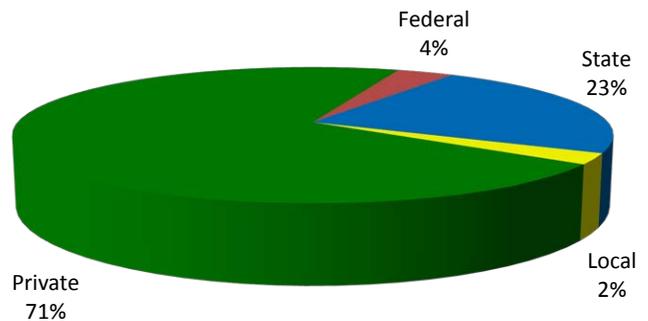


### The Resource

Pennsylvania covers a land area of 25,333 square miles and is 59 percent forested. Seventy-five percent of the forest land in the State is privately owned by 513,900 landowners. Yet in a population of 12 million people, forest landowners account for only 4 percent of the total population. Forests provide timber, watershed protection, wildlife habitat, and recreational benefits for all Pennsylvanians.



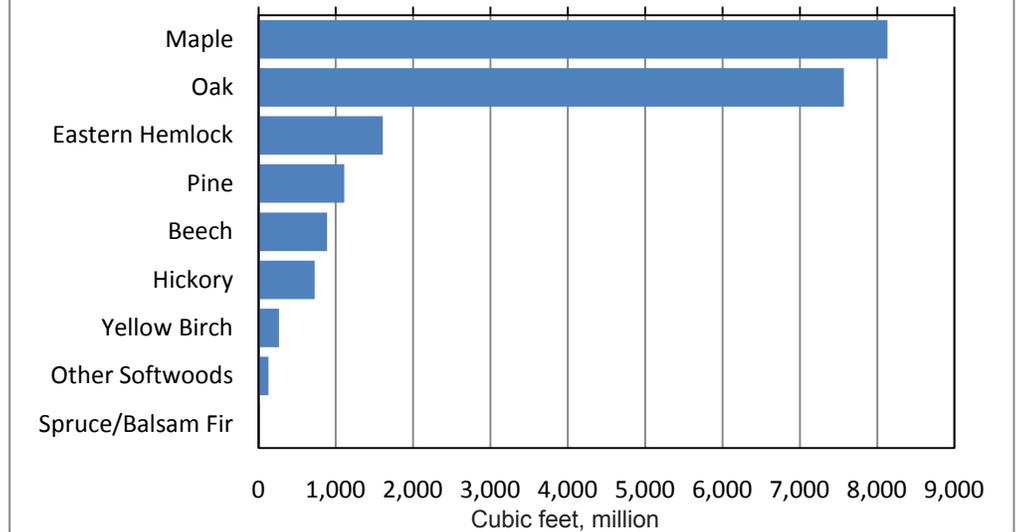
Forest Land Ownership in Pennsylvania, 2007



### 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.

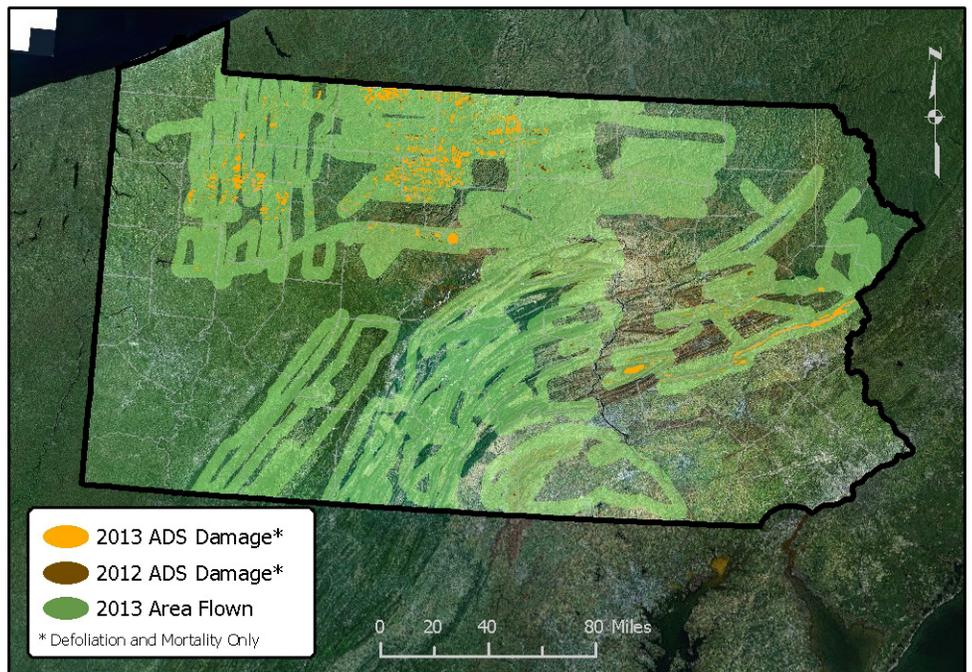
## Forest Species Types in Pennsylvania, 2007



## Aerial Surveys

A total of 10,721,280 acres were surveyed from the air in 2013. In addition, aerial survey damage polygons were ground-truthed, and ground surveys were conducted throughout the Commonwealth for major insect and disease pests.

Pennsylvania forests are generally healthy in 2013, with some minor damages found in the central and northern parts of the State. Major causal agents include oak anthracnose, maple anthracnose, and frost damage. A total of 456,329 acres of forests were discolored or defoliated this year. Tree mortality was observed in 20,375 acres. Emerald ash borer continues its expansion with 16 new counties found infested in 2013. The total reflects multi-agency observations.



*This map delineates aerial detection survey (ADS) results for Pennsylvania in 2013 and 2012.*



An intern was hired for the EAB Community Plan Promotion project to perform duties such as creating memorandums of understanding, inventory, and training within the 10 enlisted communities.

No new release sites were added in 2013; however, supplemental releases were conducted in Shawnee State Park (Bedford County), Greenwood Furnace State Park (Huntington County), and State Game Land 252 (Union County). A total of 4,058 *Tetrastichus planipennisi* and 1,654 *Oobius agrili* were released at those three sites. No *Spathius agrili* were released in 2013.

Parasitoid recovery efforts continued at State Game Land 252, North Park (Allegheny County), and Deer Lakes Park (Allegheny County) in 2013. A total of 181 EAB larvae and 122 EAB eggs were recovered from 86 log sections (1 meter long) in 5 sampled trees. EAB larvae and eggs recovered from the logs are incubated in the lab for parasitoids.

### **Hemlock Woolly Adelgid (HWA)**

Suppression continued in 6 State parks and 10 State forests in 15 counties. A total of 4,337 trees (71,773 inches d.b.h.) in 1,432 acres were (will be) treated with imidacloprid (Xytect 75WSP and CoreTect) or dinotefuran (Safari 20SG).

Leading edge surveys continued in 19 counties in 2013. A total of 101 sites in 12 counties were examined so far, with 16 positives found in 4 counties.

A total of 2,838 *Laricobius nigrinus* were released in three State parks for HWA biological control, including 689 in Little Pine, 1,033 in Cook Forest, and 1,116 in Ohio pyle. Beetles were either from laboratory colonies in New Jersey Department of Agriculture (289) or Virginia Polytechnic Institute and State University (500), or field collected in Idaho (400) or North Carolina (1,649).

### **Exotic Bark Beetles**

Survey continued for the fourth year at 12 sites. A total of 2,040 specimens were collected over the 12-week trapping period. Preliminary results showed that *Xylosandrus germanus*, *Anisandrus*

*sayi*, *Xyleborinus attenuates*, and *Gnathotrichus materiarius* were the most encountered bark beetle species.

### **Gypsy Moth (GM)**

The operational period for the 2013 gypsy moth suppression program was May 16 through May 31, with aerial applications conducted in eight counties. A total of 82 spray blocks totaling 42,014 acres were treated using *Bacillus thuringiensis* var. *kurstaki* (B.t.k.) (Foray 76B) undiluted at a dose of 38 CLUs in a single application of ½ gallon per acre. Participants included the Pennsylvania Bureau of Forestry, State Parks, Game Commission, Historical and Museum Commission, Association of Conservation Districts, Venango County (private residential forests), and the Army Corps of Engineers. State, county, and Federal governments shared the expense of this program. Participating counties contributed \$25 per acre toward the treatments of private and county/municipal forest lands. Of the 82 spray blocks 10 were sampled for post-treatment evaluation. None of the evaluated treatment sites failed to meet the criteria for success.

### **Asian Longhorned Beetle (ALB)**

Survey for Asian longhorned beetle (ALB) with traps developed by researchers from the U.S. Forest Service and Pennsylvania State University was carried out in 2013. A total of eight traps were deployed at six State Parks (Bald Eagle, French Creek, Francis Slocum, Hickory Run, Locust Lake, and Nockamixon) and one U.S. Army Corps of Engineers recreation area (Ives Run), in seven counties (Berks, Bucks, Carbon, Centre, Luzerne, Schuylkill, and Tioga). Traps were checked twice between July and October, and lures were replaced by late August. No ALB adults were found.

### **Leading Edge Survey**

The HWA leading edge survey continued in 16 counties surveyed in 2011 with a new addition of Beaver County in 2012; final results are pending.

## ***Sirex noctilio***

No survey and detection effort has been carried out by the Department of Conservation and Natural Resources since 2008. Two new counties (Clarion and Indiana) were added to the infestation map, based on results of one State University of New York research project. *Sirex noctilio* is now found in 14 PA counties.

## **Pathology Section 2013**

### **National *Phytophthora ramorum* Stream Survey**

Since 2003 the Pennsylvania Division of Forest Pest Management has participated in forest, nursery perimeter, and stream surveys to detect the presence of *Phytophthora ramorum*. Beginning in 2006 the survey shifted to monitoring streams using a rhododendron leaf bait procedure to detect *P. ramorum*. This procedure was changed in 2013 to a water sampling procedure in which rhododendron leaves and leaf disks are stowed in a water sample taken from candidate survey sites, incubated at 20-24 °C for a limited period (i.e., 3-7 days) and then tested for *P. ramorum*. A total of seven streams were monitored between 2012 and 2013, during three autumn sampling periods using the bait bag procedure and three spring sampling periods using the water sampling procedure. *P. ramorum* has not been detected in the water courses surveyed from 2006 through June 2013. Autumn 2013 surveys were conducted, but no test results are available at this writing. This work is coordinated with Pennsylvania State University Department of Plant Pathology, the Pennsylvania Department of Agriculture Division of Plant Industries, the USDA Forest Service, State and Private Forestry and Forest Health Monitoring Program, and the Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry, Division of Forest Pest Management.

### **Thousand Cankers Disease (TCD)**

The Division of Forest Pest Management has been monitoring for walnut twig beetle (*Pityophthorus juglandis*) in Bucks County, PA, where TCD (*Geosmithia morbida*) was first reported in 2011 on black walnut (*Juglans nigra*). In 2013 the Division

maintained 16 walnut twig beetle monitoring traps (Lindgren traps with pheromone lures) to determine the prevalence of walnut twig beetle and potentially of TCD in proximity to the original detection site. Insects were collected from traps weekly, from April through late September, and sent to the USDA Forest Service, Pacific Southwest Research Station, Davis, CA, for assessment and identification of trap contents. Since 2012 indications are that a major flight period occurs during September – October and a lighter flight period occurs during April – May. The Pennsylvania Department of Agriculture maintains a Statewide walnut twig beetle monitoring program, with traps located in 25 counties where black walnut products are stockpiled, shipped, and processed; and where walnut byproducts are incorporated in mulch piles. At this writing the beetle has not been detected outside Bucks County; TCD continues to be resident in Bucks County.

### **Beech Scale Resistance**

In 2012 an effort was made to implement beech scale challenge tests, to evaluate and select potential scale-resistant beech genetic stock. A total of 29 trees were tested. In July through August, the challenge inoculations were examined: 7 trees remained free of scale; 15 trees had moderate to heavy scale infestation; and 7 trees had light scale infestations. Plans are being made to select trees for scion wood collections during winter 2013-2014 in support of making grafts and adding scale-resistant trees to a seed orchard planting near the Moshannon State Forest District Office. This work is being done in collaboration with Dr. Jennifer Koch and the USDA Forest Service, Northern Research Station, at Delaware, OH.

### **Butternut Conservation**

Since 2009 the Division of Forest Pest Management has participated in a project to locate and conduct genetic tests of *Juglans cinerea* specimens from forested areas of Pennsylvania, in order to validate genetic pedigree and to separate out genetic material that has hybridized with Asian walnut, (*Juglans ailantifolia*). Scion wood from select *J. cinerea* families were used to generate grafted ramets that could be added to a seed orchard

planting of Pennsylvania butternuts located at the Greenwood Furnace Nursery. A total of 61 grafted ramets of Pennsylvania origin were transported from the University of Missouri and planted at the seed orchard location. Collaboration with the USDA Forest Service regional geneticist in Milwaukee, WI, and the Allegheny National Forest to establish a seed orchard on the National Forest has provided an opportunity to aggressively locate and conserve select material for future conservation and restoration work.

### **Oak Mortality Observations**

Over the past 2 - 3 years concerns have been increasing about oak mortality and oak decline. The 2008-2010 period of defoliation damage due to gypsy moth and forest tent caterpillar across the Northern Tier and Ridge and Valley region is a normal expectation of repeated defoliation events. Some interest in the role of soil-borne plant pathogens (i.e., *Phytophthora* root rot and *Armillaria* root rot), anthropogenic impacts associated with soil disturbance and compaction, and weather-related stressors (i.e., cold temperatures, drought, storm damages) remain a normal feature of year-to-year impacts and variations. Prevalence of oak wilt (*Ceratocystis fagacerarum*) in forested areas tends to be scattered and localized; however, right-of-way clearing and maintenance associated with tree pruning and hazard tree removals is an area of concern for transmission and spread of oak wilt. Expansion and development of natural gas resources has led to increased forest fragmentation

and forest edge areas and may increase the opportunity for spread of select insect and disease agents, including *Ceratocystis fagacerarum*.

### **Sugar Maple Health Studies**

Sugar maple decline observed in the early- to mid-1980's across the Northern Tier of Pennsylvania continues to be a concern. Tree dieback and mortality associated with the 2009-2010 forest tent caterpillar outbreak and associated root diseases remain prevalent. The long term influence of other forest health stressors (i.e., deer browse, root disease, insect defoliation, drought, cold temperature injury, and windthrow events) remain important damage causing agents in the northern hardwood and oak forest types.

## Acknowledgments

The aerial detection survey map was produced by the U.S. Forest Service, Forest Health Protection, in Morgantown, WV, using survey data from the Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry, Division of Forest Pest Management.

## References

### Land Cover Map:

U.S. Geological Survey. 2011. 2006 National land cover dataset. Sioux Falls, SD.

### Forest Land Ownership, Forest Species Type:

U.S. Department of Agriculture, Forest Service. 2009. Forest resources of the United States, 2007. Gen. Tech. Rep. WO-78. Washington, DC. 336 p.



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