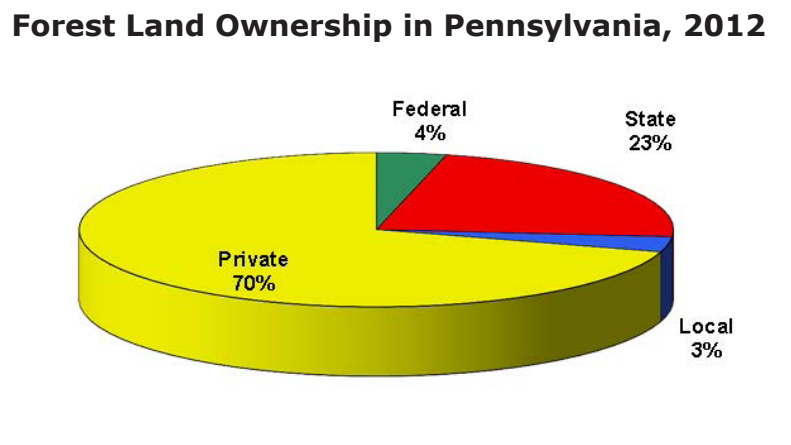
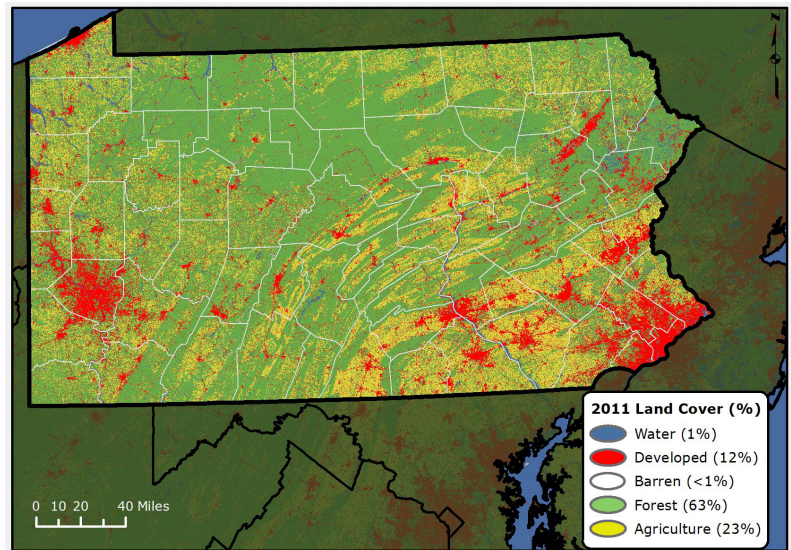




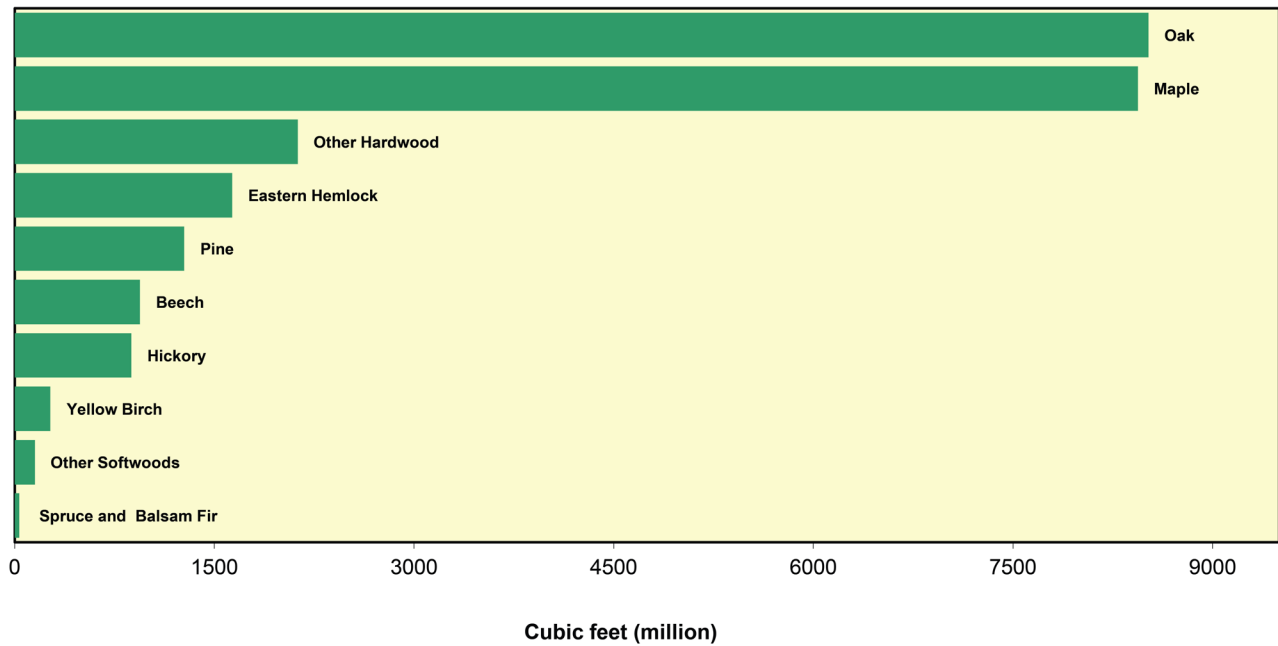
# 2015 Forest Health PENNSYLVANIA highlights

## 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.

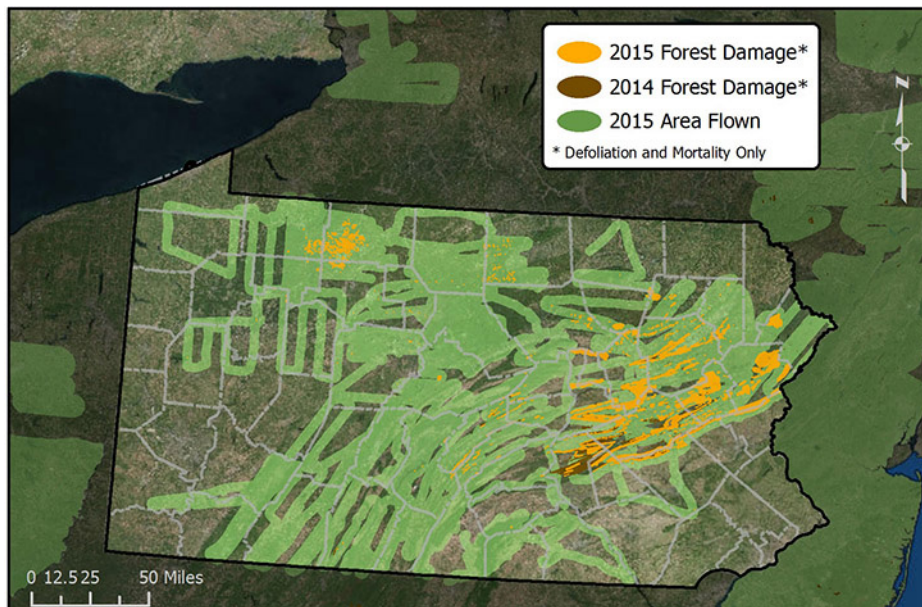


## Net Volume of Growing Stock on Timberland by Species in Pennsylvania, 2012

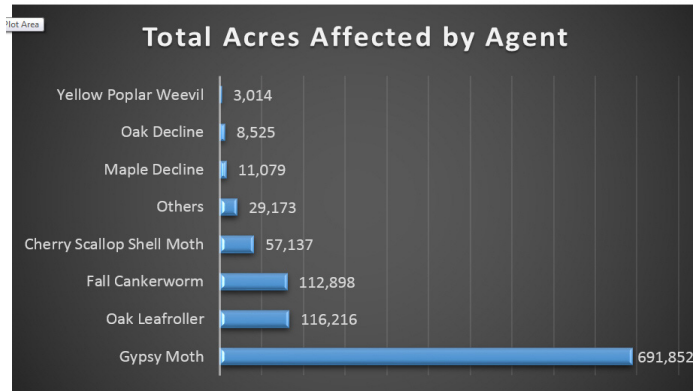


## Forest Health Surveys

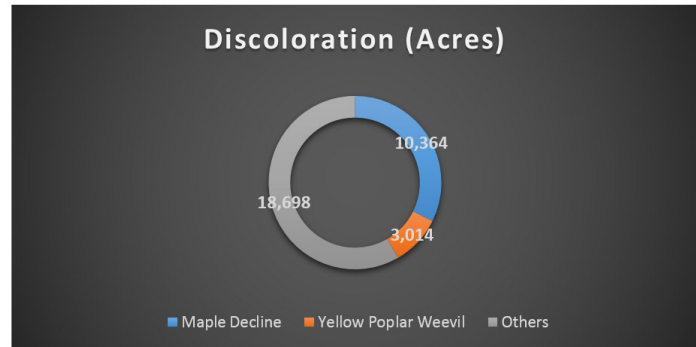
Pennsylvania used aerial surveys to gauge the health of its forests. Gypsy moth was the leading contributor to defoliation in 2015 with 691,852 acres affected. Interestingly though, two native insects had the next highest defoliation numbers: oak leafroller and fall cankerworm. Two other insects of note were yellow poplar weevil and cherry scallop shell moth, which had uncommonly high populations and defoliation.



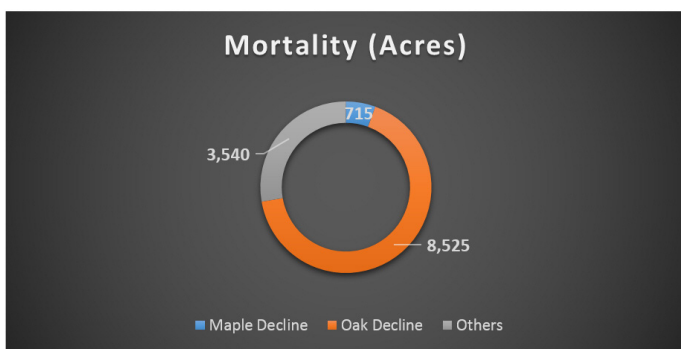
*Forest health survey observations in Pennsylvania in 2014 and 2015.*



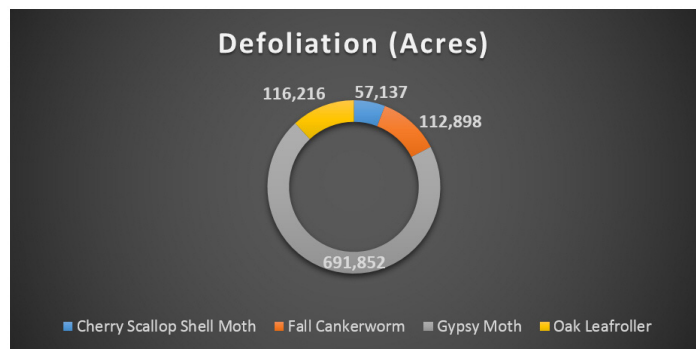
Total acres affected by damage agent in Pennsylvania in 2015.



Acreage of discoloration in Pennsylvania in 2015 by damage agent.



Acreage of mortality in Pennsylvania in 2015 by damage agent.

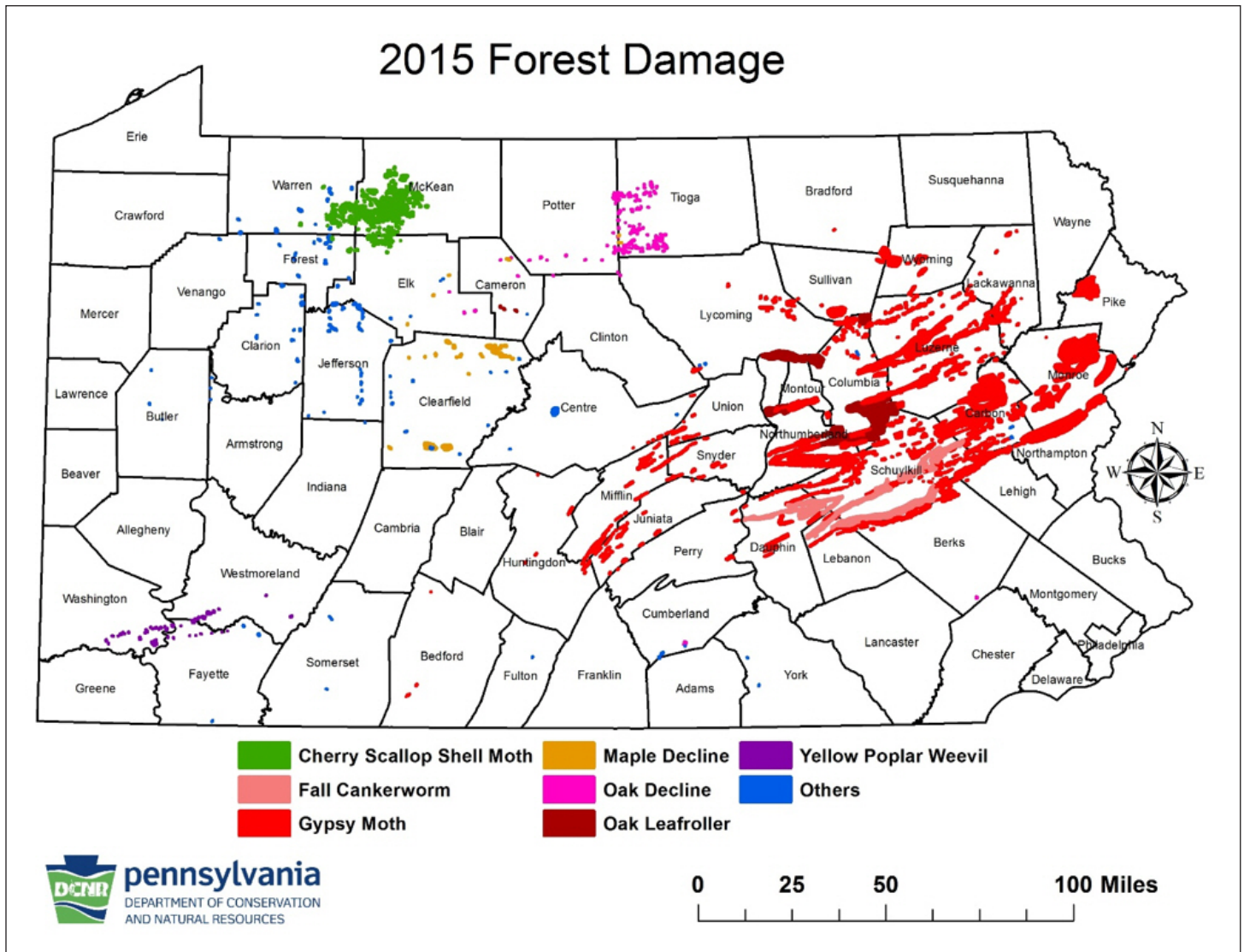


Acreage of defoliation in Pennsylvania in 2015 by damage agent.

### Acres Affected by Damage Type

Causal Agent	Dieback	Defoliation	Discoloration	Mortality	Total
Cherry scallop shell moth		57,137			57,137
Fall cankerworm		112,898			112,898
Gypsy moth		691,852			691,852
Maple decline			10,364	715	11,079
Oak decline				8,525	8,525
Oak leafroller		116,216			116,216
Yellow poplar weevil			3,014		3,014
Others	6,935		18,698	3,540	29,173
<b>Total</b>	<b>6,935</b>	<b>978,103</b>	<b>32,076</b>	<b>12,780</b>	<b>1,029,894</b>

# Forest Damage Map



*Pennsylvania forest damage 2015.*

## Emerald Ash Borer

### Biological Control

The Division of Forest Health in the Pennsylvania Department of Conservation and Natural Resources (DCNR) Bureau of Forestry continued releasing biological control agents for emerald ash borer by releasing a total of 25,359 female *Tetrastichus planipennis* and 10,600 female *Oobius agrili*.

### Chemical Control

*State Land:* Six hundred ninety-nine additional ash trees were treated for emerald ash borer via emamectin benzoate stem injections.

*Non-State Land:* The five-community emerald ash borer project has begun, and all treatments are concluding for the year. We have visited each of the five communities and met with the individuals responsible for managing the treatments. The intergovernmental agreements between each community and DCNR are under various stages of processing. Two agreements have been finalized as of October 14, 2015; two are being processed; and one is still going through all of the necessary signatures.

### Additional Counties Infested

McKean County and Lancaster County were confirmed to have emerald ash borer in 2015.

## Hemlock Woolly Adelgid

### HWA Suppression

Pennsylvania treated 1,960 hemlocks for hemlock woolly adelgid control in State Forests and State Parks (not including Cook Forest State Park).

Active Ingredient	Treatment Method	Acres Treated	Inches Treated
Imidacloprid	soil injection	75	15,000
Imidacloprid	soil drench	300	35,750
Dinotefuran	soil injection	34	6,650
Dinotefuran	basal spray	40	4,000

## HWA Leading Edge Survey

A total of 200 sites in 16 counties were examined thus far, with 9 positive detections in 7 counties. Armstrong County was also added to the list of infested counties, having been confirmed in October.

### HWA Biological Control

No beetles were released in 2015.

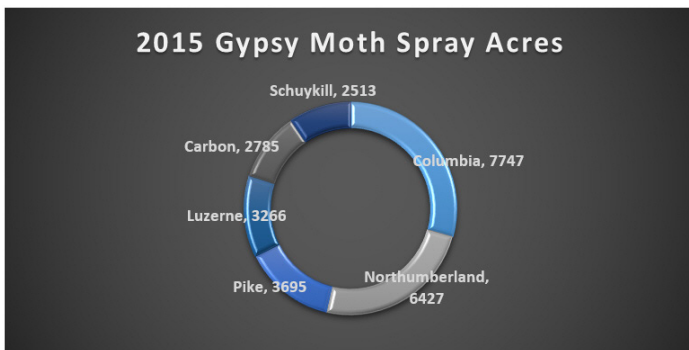
### Exotic Bark Beetle Early Detection Rapid Response

Over half of all trap captures were either *Xyleborinus attenuates* (34 percent) or *Xylosandrus germanus* (24 percent), with 40 other species of beetles representing the remaining portion (see table on the next page).

Species	Count	% of Capture	Species	Count	% of Capture
<i>Xyleborinus attenuatus</i>	3,758	34.534	<i>Ips pini</i>	25	0.230
<i>Xylosandrus germanus</i>	2,588	23.782	<i>Pityophthorus</i>	24	0.221
<i>Xylosandrus crassiusculus</i>	958	8.804	<i>Hylesinus aculeatus</i>	17	0.156
<i>Trypodendron lineatum</i>	722	6.635	<i>Ips grandicollis</i>	15	0.138
<i>Xyleborinus saxesenii</i>	692	6.359	<i>Phloeotribus liminaris</i>	14	0.129
<i>Tomicus piniperda</i>	401	3.685	<i>Trypodendron domesticum</i>	8	0.074
<i>Gnathotrichus materiarius</i>	344	3.161	<i>Dryoxylon onoharaensum</i>	7	0.064
<i>Orthotomicus caelatus</i>	227	2.086	<i>Hylastes porculus</i>	6	0.055
<i>Xyloterinus politus</i>	223	2.049	<i>Monarthrum fasciatum</i>	6	0.055
<i>Cyclorhipidion pelliculosum</i>	136	1.250	<i>Pityophthorus cariniceps</i>	6	0.055
<i>Hylurgops rugipennis pinifex</i>	108	0.992	<i>Pityogenes hopkinsi</i>	5	0.046
<i>Hylastes opacus</i>	95	0.873	<i>Hylastes tenuis</i>	4	0.037
<i>Hylurgops palliatus</i>	71	0.652	<i>Xyleborus pubescens</i>	4	0.037
<i>Hypothenemus</i>	69	0.634	<i>Ips calligraphus</i>	3	0.028
<i>Anisandrus sayi</i>	68	0.625	<i>Conophthorus sp.</i>	2	0.018
<i>Euwallacea validus</i>	59	0.542	<i>Phloeotribus dentifrons</i>	2	0.018
<i>Dryocoetes affaber</i>	49	0.450	<i>Polygraphus rufipennis</i>	2	0.018
<i>Ambrosiophilus atratus</i>	43	0.395	<i>Dryocoetes autographus</i>	1	0.009
<i>Dendroctonus valens</i>	43	0.395	<i>Hylesinus criddlei</i>	1	0.009
<i>Monarthrum mali</i>	38	0.349	<i>Scolytus</i>	1	0.009
<i>Cyclorhipidion bodoanum</i>	36	0.331	<i>Xyleborus xylographus</i>	1	0.009
<b>Total 10,882</b>					

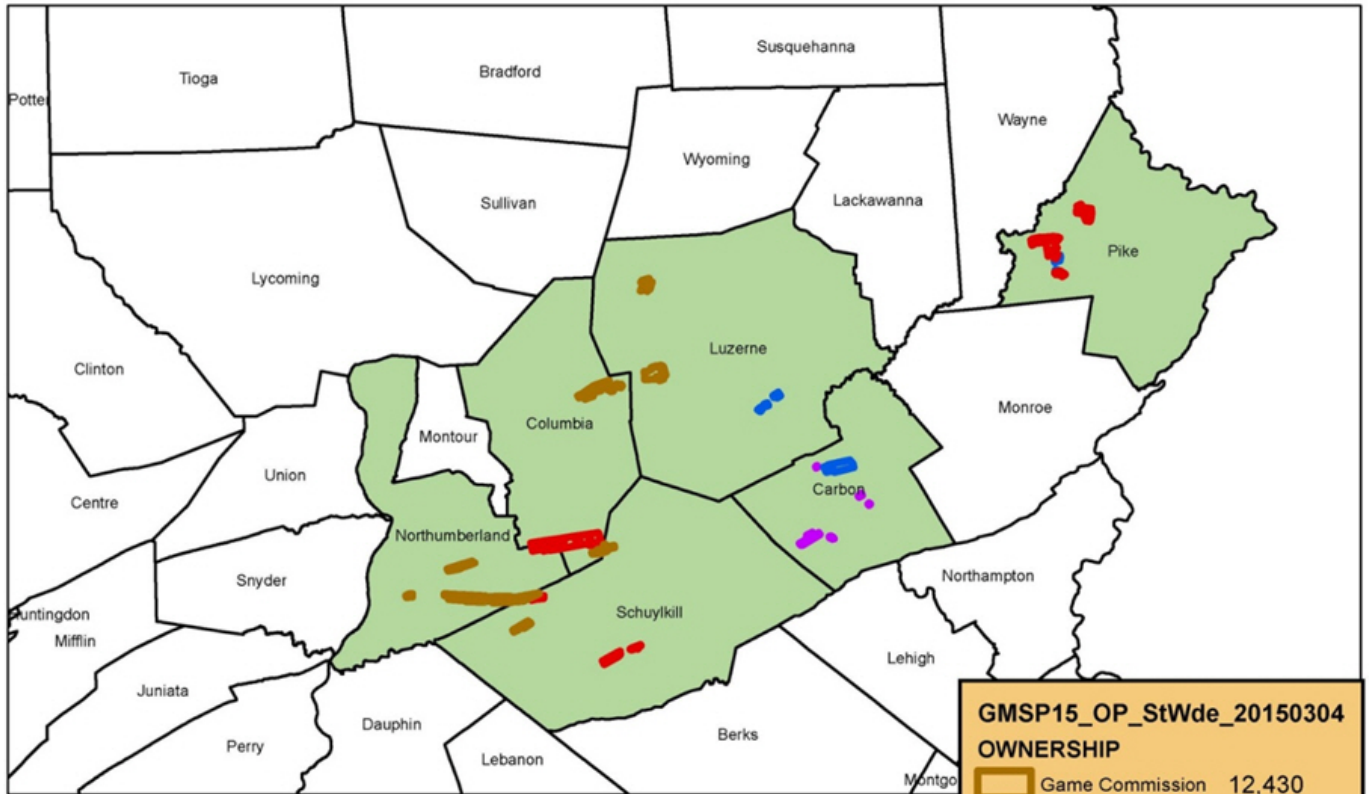
## Gypsy Moth Spray Program

In 2015 there were 26,433 acres treated for gypsy moth using FORAY 76B at ½ gallon per acre (38CLUs/acre).



Acres sprayed for gypsy moth control in 2015 by county.

## 2015 Pennsylvania Cooperative Gypsy Moth Suppression Program

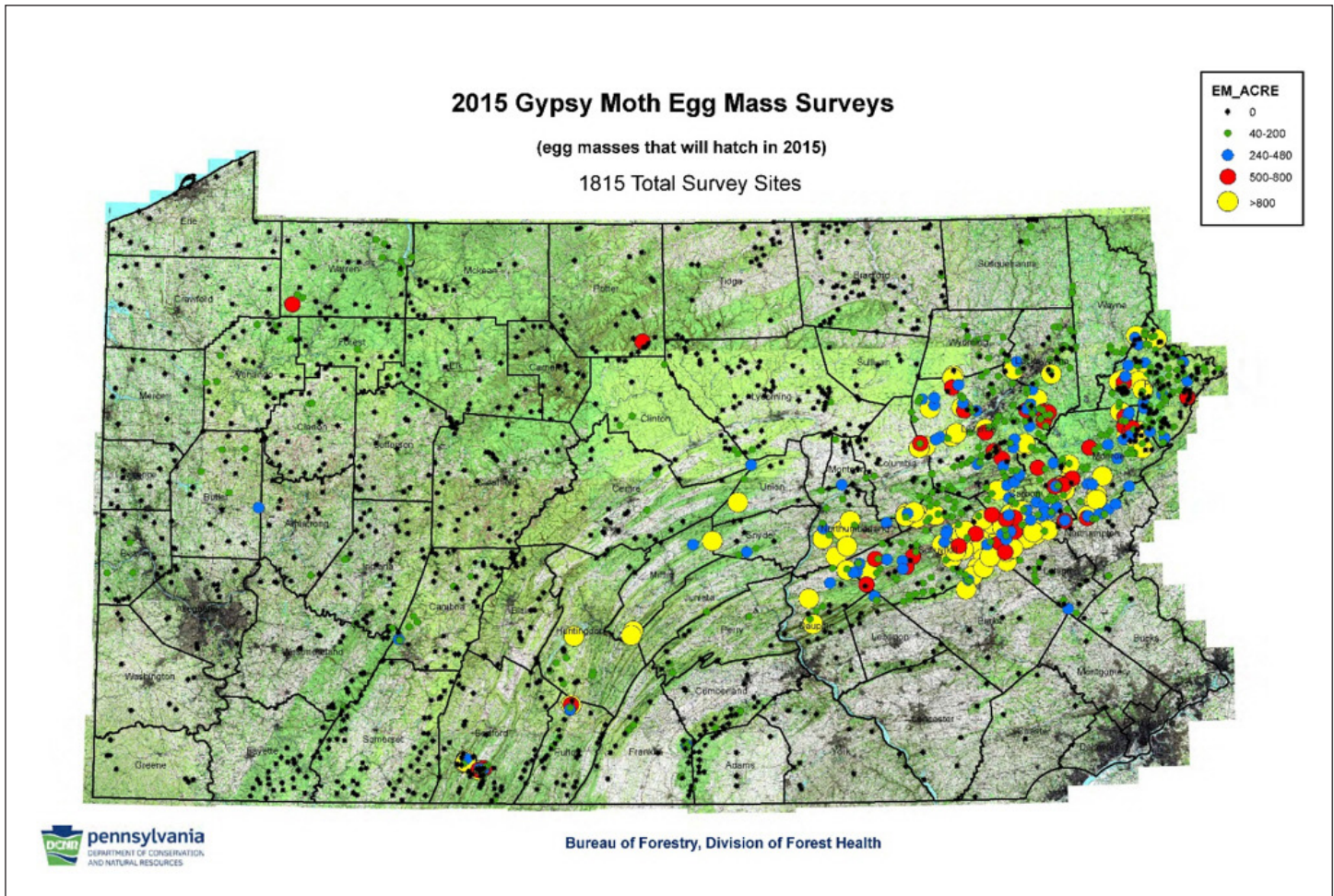


GMSP15_OP_StWde_20150304	
OWNERSHIP	
<span style="display: inline-block; width: 15px; height: 10px; background-color: #D2B48C; border: 1px solid black;"></span> Game Commission	12,430
<span style="display: inline-block; width: 15px; height: 10px; background-color: #800080; border: 1px solid black;"></span> Private	744
<span style="display: inline-block; width: 15px; height: 10px; background-color: #FF0000; border: 1px solid black;"></span> State Forest	10,623
<span style="display: inline-block; width: 15px; height: 10px; background-color: #0000FF; border: 1px solid black;"></span> State Park	2,606

**38 Spray Blocks  
26,433 Acres**



*2015 Pennsylvania Cooperative Gypsy Moth Suppression Program.*



2015 Gypsy moth egg mass surveys.

## Asian Longhorned Beetle

There was only a general survey for this pest in 2015. Pennsylvania has still not detected Asian longhorned beetle.

## Sirex

DCNR did not carry out a special Sirex survey in 2015. One new county (Lackawanna) was added to the infestation map based on Sirex detection by the Pennsylvania Department of Agriculture.

## Conifer Blights

There was widespread but scattered needle casting, tip and branch dieback, and tree mortality of conifers in 2015. The tree species and associated blight(s) are listed here:

*Picea pungens*: *Rhizosphaeria kalkhoffii* /  
*R. pini* (Needle Cast)

*Picea pungens*: *Stigmina lautii* (Needle Cast)

*Picea abies*: *Herpotrichia juniperi* (Brown Felt Blight)

*Pinus resinosa*: *Sphaeropsis sapinea* (Tip Blight)

*Pinus sylvestris*: Ditto

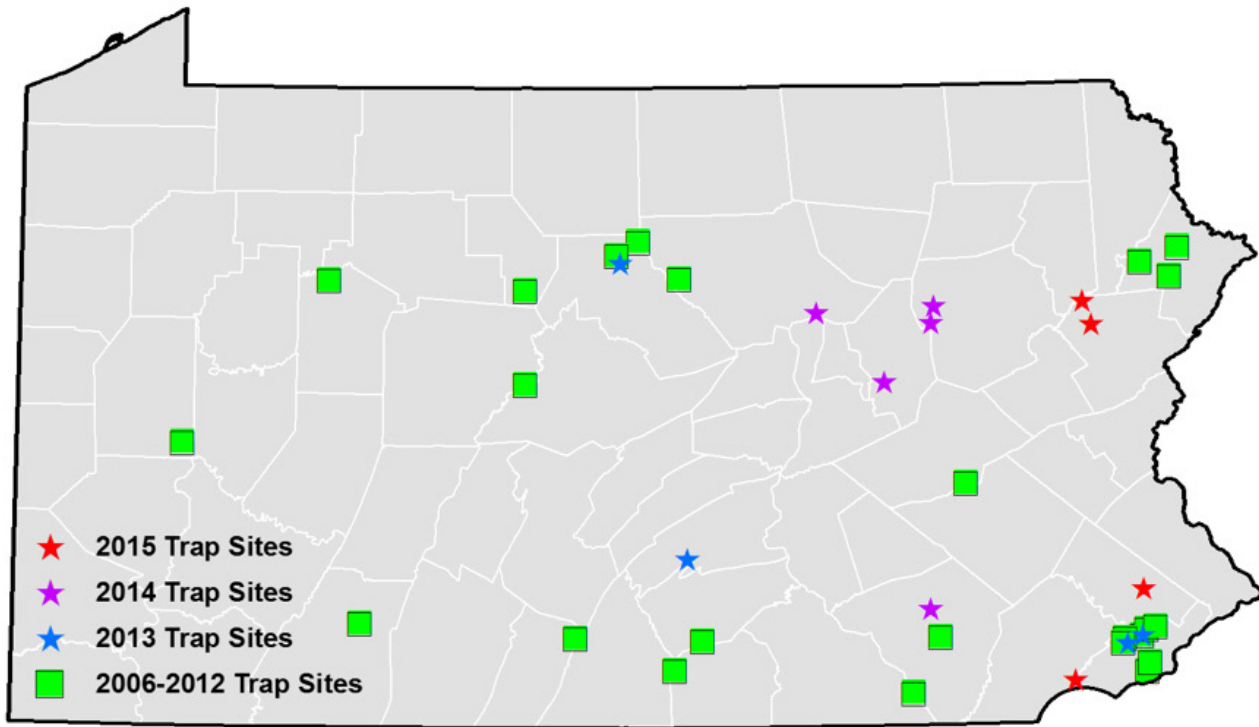
*Tsuga canadensis*: *Fabrella* Needle Cast and *Sirococcus* Blight

*Pinus strobus*: *Canavirgella* Needle Cast and Brown Spot

*Pinus strobus*: Pine Bast Scale (?) damage and salt aerosol injury



## Phytophthora ramorum Stream Survey 2006–2015



*Phytophthora ramorum* trap sites from 2006 to 2015.

Since the start of this project, there have been no positive *Phytophthora ramorum* samples collected in Pennsylvania. Out of the 17 States in the survey (2,881 samples/232 stream sites), 110 positive samples have been collected (States with positive samples highlighted in red and with an asterik in the table).

State	Samples
AL*	381*
CT	34
FL*	116*
GA*	636*
IA	17
IL	5
MD	80
MS*	201*
NC*	309*
NY	48
OH	24
PA	198
SC	296
TN	162
TX*	161*
VA	174
WV	39
<b>Total</b>	<b>2,881</b>

## Thousand Cankers Disease

In 2015, eight traps were placed across four Pennsylvania counties to detect walnut twig beetle (*Pityophthorus juglandis*). Currently only Bucks County has been positive for walnut twig beetle.

County	# of Traps	Walnut Twig Beetle Positive
Bucks	4	yes
Chester	2	no
Delaware	1	no
Montgomery	1	no

## Beech Scale Resistance

In 2015 two seed orchards were established for potentially resistant beech within Moshannon State Forest and Susquehannock State Forest. Of the 22 beech families represented, 8 came from the Allegheny National Forest and 14 from Pennsylvania's State Forests. Eighty-four ramets were planted in Moshannon State Forest and 60 were planted in Susquehannock State Forest, with an additional 138 ramets available for planting in 2016. These orchards will provide beech scale-resistant seed and seedlings to support conservation and restoration plantings.

## 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.

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Forest Health Protection  
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Pennsylvania Department of Conservation and  
Natural Resources, Bureau of Forestry  
Division of Forest Pest Management  
208 Airport Drive H.I.A.  
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717-948-3941  
<http://www.dcnr.state.pa.us/forestry/index.aspx>