



# North Carolina Forest Health Highlights



## 2013

### Our Forests

North Carolina's forests cover 18.6 million acres, or about 60 percent of the state's land area. Ninety-seven percent of the forested area (18.1 million acres) is considered available for timber production and classified as timberland.

Most of the state's forested land, (11.3 million acres) is owned by individuals, families and non-corporate entities. About 2.9 million acres is owned by private corporations not involved in forest product manufacturing and about 1.3 million acres is owned by forest industry. Public lands (federal, state and local) total 2.6 million acres.

Recent forest inventory data reveal that the state's forests are growing more wood volume each year than is being harvested or lost due to mortality or conversion to non-forest uses. This is true for both hardwoods and softwoods and is a positive reflection on the ability of the state's forest to sustainably supply goods and services for all North Carolinians. Forestry is an important industry in the state, providing nearly 180,000 jobs.



Ash and Walnut

North Carolina's forests are also prized for their scenic beauty, supporting tourism and outdoor recreation, and providing wildlife habitat from the Appalachian Mountains to the lowlands of the Atlantic Coastal Plain. Major forest types in the state include oak-hickory, loblolly-shortleaf pine, oak-pine, and oak-gum-cypress.

### 2013 Influences on Health of Forests in North Carolina

The beauty and productivity of North Carolina's forests have historically been challenged by a variety of threats. Healthy forests are generally accustomed to pests and conditions that are common to the area where they grow. Outbreaks of common pests may occur periodically and cause a great deal of damage; but, for the most part, forests are resilient and outbreaks eventually subside. Newly introduced pests, on the other hand, can have devastating impacts on the forests of our state as trees may be lacking defense responses necessary to repel attacks from these new threats.

In the last year, two new non-native invasive threats to forest health in the state were detected: **thousand cankers disease** of walnuts, and **emerald ash borer**. Another threat, **laurel wilt**, which was first detected in North Carolina in 2011, continued to expand in range in the southeastern part of the state. All three of these threats can be accelerated by the movement of firewood. A map showing where these pests were found at the end of 2013 can be found at the end of this publication.

In addition to these new threats, more common pests such as **bark beetles**, insect **defoliators** and leaf infections by **anthracnose** pathogens were present throughout the state.

## Found in Firewood

The movement of infested plants and wood products can spread invasive pests from one area of the state (or country) to another. One common but often overlooked way that these invasive species make it into the state's parks, forests, and private campgrounds is through the movement of firewood.



Some invasive insects, such as the **gypsy moth**, can lay eggs on pieces of firewood. Others, such as **walnut twig beetle** (which carries the fungus that causes **thousand cankers disease**), **emerald ash borer**, and **redbay ambrosia beetle** (which carries the fungus that causes **laurel wilt**), spend parts of their life-cycle within wood and can emerge from firewood as adults ready to infest new trees.

One way to help prevent the spread of these dangerous invasive species is by using local firewood. A good rule of thumb is to burn wood within a 50 mile radius of its origin. Additionally, one should not bring firewood into North Carolina from another state unless it has been treated to kill pests, and/or inspected or certified as pest free. If firewood has inadvertently been brought into the state, or has been moved long distances within the state, it should be burned as soon as possible. A national campaign is underway to limit the movement of firewood due to the potential for transporting pests, primarily non-native invasive insects and diseases, from one geographic area to another. The state of North Carolina has started an educational effort to encourage residents and visitors to use local firewood or firewood that has been treated and thoroughly inspected for hitchhiking pests.



## Thousand Cankers Disease of Walnut Trees Found in Haywood County

Late in 2012, **thousand cankers disease (TCD)** was first detected in North Carolina in Haywood County near Cataloochee in the Great Smokie Mountains National Park. Black walnut and butternut trees in North Carolina are at risk of infection leading to eventual mortality from the disease. The fungus that causes TCD is carried by the very tiny **walnut twig beetle**. Both the fungus and the insect vector were found in walnut trees for the first time in the east in Knoxville, TN in July 2010. Both are native to the southwestern United States and Mexico, and are thought to have been brought east in affected walnut wood.



In North Carolina, a quarantine was enacted in January 2013 to prohibit the movement of infected materials from Haywood County to unaffected areas of the state. Regulated materials in Haywood County include unprocessed wood from walnut trees, and hardwood firewood. Previously, an external quarantine was implemented against importation of firewood and walnut wood products from states where the disease is known to be present. The North Carolina Forest Service has been actively working with the United States Department of Agriculture Forest Service (USFS), North Carolina Department of Agriculture and Consumer Services (NCDA&CS) Plant Industry Division and the University of Tennessee in trapping and surveying for newly affected areas in the state. In 2013, no new affected sites were detected. Being a new to eastern forests, there are many unknowns about the insect and disease, including pest control measures. Research is ongoing.

## Emerald Ash Found in Four North Carolina Counties

The first evidence of **emerald ash borer (EAB)** in North Carolina was found during a standard check of emerald ash borer traps in Granville County. Declining ash trees were observed and signs of EAB activity were present in several trees. Eventually an actual beetle was found in one of the trees. The initial detections were found in Granville County near the NC/VA state line. Additional surveying found emerald ash borer activity in the nearby counties of Person, Vance, and Warren Counties. These counties are now under state and federal **quarantines** to prevent the spread of this pest throughout the state. The movement of ash wood products and hardwood firewood outside the quarantine area is not permitted without a compliance agreement issued by



the NCDA&CS Plant Industry Division. Plant Industry and the N.C. Forest Service are working in cooperation with the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service and Forest Service to monitor and slow the spread of this pest.

While this finding was expected at some point, its presence in the state is nonetheless unfortunate. The emerald ash borer, which is native to Asia, is a wood-boring beetle that infests and kills all species of ash in the U.S. In North Carolina, four species of ash are threatened: green, white, Carolina and pumpkin ash.

First discovered in Michigan in the summer of 2002, this tiny wood boring insect most likely arrived in the United States in wood packing materials originating from its native forest in Asia. It quickly began to spread and in 2013 North Carolina became the 20th state in the country to confirm the presence of the destructive pest. Currently, there is no reliable control method to stop this insect from spreading. The arrival of this insect in North Carolina poses a serious threat to ash species; localized extinction of ash is likely, but the long term effects of such a dramatic change in forest species composition is poorly understood.



Control of EAB is possible with systemic pesticides in urban areas (ash street trees, and park and yard trees), but there is no cost effective control for this borer in rural forest settings. Research is ongoing related to long term management strategies of EAB, including the introduction of biological controls. To aid in this research, N.C. Forest Service forest health staff released nearly 25,000 parasitic wasps in Granville County to study the establishment, dispersal, and impact these natural enemies have on suppressing EAB populations and the recovery of ash trees. The releases are not expected to save trees on the site or on adjacent properties, but rather the hope is that they will build the foundation for future EAB control. The wasps, which naturally do not sting, are reared in a U.S. Department of Agriculture laboratory in Brighton Michigan and releases are conducted under specific USDA guidelines.

### Laurel Wilt Now Detected in Six North Carolina Counties

The devastating **laurel wilt** disease was first confirmed in North Carolina in 2011. The pathogen that causes laurel wilt is from Asia and was first discovered in Georgia in 2003. Since then, it has spread into six states in the southeast, including North Carolina. In South Carolina, Georgia, and Florida, this disease has killed more than 95 percent of susceptible trees in infected stands and has gained the attention of forest pathologists for its ability to kill healthy, mature trees in only a few weeks. The pathogen that causes laurel wilt is carried from tree to tree by the **redbay ambrosia beetle**.



In North Carolina, this disease is currently found in portions of Bladen, Brunswick, Columbus, New Hanover, Pender, and Sampson counties. New Hanover County is the only new county to be confirmed in 2013, though the disease has been spreading within previously confirmed counties as well.

Only plants in the Laurel family are susceptible to laurel wilt. The most severely affected species are redbay and swampbay, which are medium sized trees commonly found throughout the eastern part of the state, particularly in coastal forests. Other susceptible trees and shrubs in the Laurel family include sassafras, spicebush, pondspice, and pondberry.

### Bark Beetles

The **southern pine beetle (SPB)** has historically been North Carolina's most significant forest insect pest. From 1999 through 2002, the beetle killed at least \$84 million worth of timber in North Carolina. Most of the mortality during that outbreak was in the mountains and western piedmont areas. Since then, beetle activity has been relatively low and there were no reports of southern pine beetle activity on state or private forest lands in 2013. While this pest is

currently having a minimal impact on North Carolina's pine trees, prevention efforts remain important because the insect periodically increases to epidemic proportions. Statewide in 2013, *Ips engraver* and **black turpentine beetle** activity continued to be of concern, but numbers of reports are down from previous years due to return of adequate rainfall in the past year.

*Southern pine beetle prevention efforts remain important during periods of low beetle activity.* **The Southern Pine Beetle Prevention Program**, funded through a grant from the USDA Forest Service, will reimburse non-industrial private forest landowners in North Carolina for some of the cost of pre-commercial thinning of pine stands. During a pre-commercial thinning, trees with no commercial value are removed in order to allow remaining trees to grow with less competition for food and sunlight. Such thinning improves the health of the remaining trees and reduces the stand's susceptibility to the southern pine beetle. Since the program began, over 60,000 acres have been thinned through this program to encourage proper management conditions for pine stand health and to reduce the likelihood of southern pine beetle infestations.

## **Insect Defoliators**

Several insects which defoliate hardwood trees had greater than normal activity in the state.

**Fall and spring cankerworms** were active throughout the piedmont region, primarily in urban areas with Durham experiencing enough activity that citizens were encouraged to install tree bands (sticky bands) around their oak trees in the winter to minimize outbreaks next spring. Defoliation also was reported in Wake County and Charlotte/Mecklenburg County.



**Fall webworms** populations were also heavier than normal throughout the eastern half of the state. In addition to munching on the leaves of a variety of hardwoods, the webworm caterpillars create gaudy webs at the ends of branches that cause concern from landowners.

Pine trees in the coastal plain and piedmont also were visited by defoliating insect again in large numbers in 2013. **Redheaded pine sawflies** were found in large numbers infesting young pines, primarily longleaf pines, throughout the native range of the longleaf. This created lots of concern for landowners who observed pines completely stripped of their needles.

The native defoliators listed above cause damage that is mainly unsightly, but they usually have little impact on healthy trees in the long-run.

## **Anthracnose Diseases**

The cool, wet spring and summer in 2013 created perfect conditions for fungal diseases on hardwood tree foliage. **Anthracnose** was commonly observed affecting sycamores and maples, with sycamores being most affected. Spores from the fungal pathogen land on leaves and thrive in wet conditions. Once the pathogen infects the leaf surface, it causes necrotic blotches to form on the leaves. In some cases, the pathogen works its way down the leaf petiole and into twigs and branches causing small cankers on the surface. In 2013, infected sycamore trees experienced many of these cankers and eventual dieback. Most affected trees are expected to recover from the dieback.

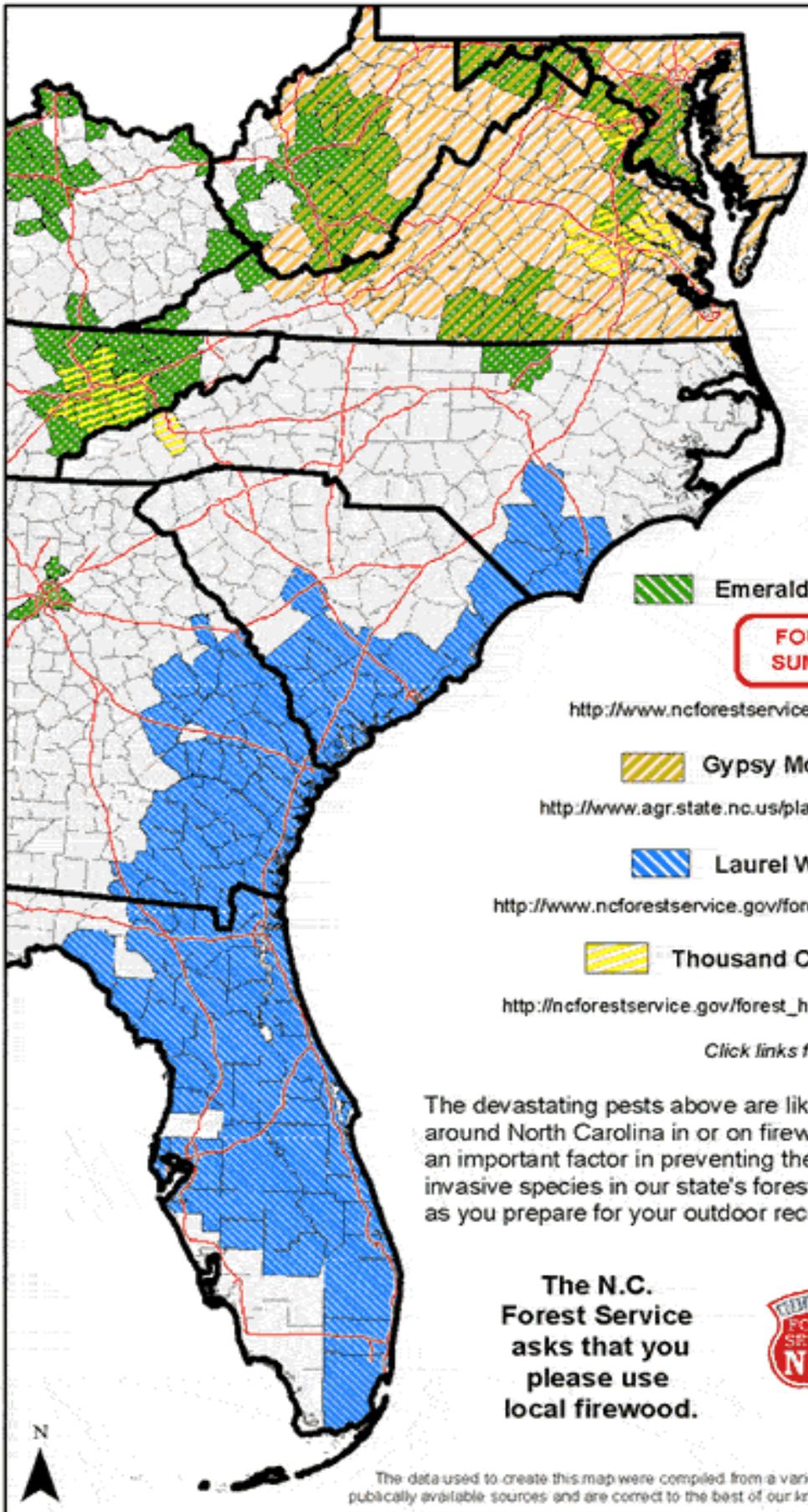
## Forest Health Assistance in North Carolina

With assistance and support from the USDA Forest Service, the NCFS is responsible for providing assistance to the forest landowners of the state in the detection and control of destructive forest insects and diseases. Forest health specialists in the Forest Protection Division direct this responsibility. Services are provided to forest landowners by district and county personnel with the Forest Health Section staff providing appropriate training along with professional and technical expertise in the diagnosis and control of destructive insects and diseases.

**North Carolina Department of Agriculture and Consumer Services**  
**N.C. Forest Service**  
**Forest Health Section**  
**1616 Mail Service Center**  
**Raleigh, North Carolina 27699-1616**  
**919-857-4858**  
**<http://www.ncforestsservice.org>**

**United States Department of Agriculture Forest Service**  
**Southern Region, State & Private Forestry**  
**Forest Health Protection**  
**200 W.T. Weaver Road**  
**Asheville, North Carolina 28804**  
**828-257-4320**  
**<http://www.fs.fed.us/r8/foresthealth/>**

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# Where are they now?

## Monitoring Firewood-Vectored Invasive Forest Pests in North Carolina

 Emerald Ash Borer (8/5/2013)

**FOUND IN NC  
SUMMER 2013**

[http://www.ncforestservice.gov/forest\\_health/fh\\_eabfaq.htm](http://www.ncforestservice.gov/forest_health/fh_eabfaq.htm)

 Gypsy Moth Quarantine (1/2/2013)

<http://www.agr.state.nc.us/plantindustry/plant/entomology/GM.htm>

 Laurel Wilt Disease (8/5/2013)

[http://www.ncforestservice.gov/forest\\_health/forest\\_health\\_laurelwiltfaq.htm](http://www.ncforestservice.gov/forest_health/forest_health_laurelwiltfaq.htm)

 Thousand Cankers Disease (1/3/2013)

[http://ncforestservice.gov/forest\\_health/forest\\_health\\_thousandcankers.htm](http://ncforestservice.gov/forest_health/forest_health_thousandcankers.htm)

*Click links for more information*

The devastating pests above are likely to be brought into or moved around North Carolina in or on firewood. The use of local firewood is an important factor in preventing the spread of potentially devastating invasive species in our state's forests. Please keep this in mind as you prepare for your outdoor recreation activities.

**The N.C. Forest Service asks that you please use local firewood.**



The data used to create this map were compiled from a variety of publically available sources and are correct to the best of our knowledge.

Map Created 8/19/2013  
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