Summer 2018 Newsletter

The EcoForester
Invasive Species Edition

Novel Ecosystems: Forestry and Invasive Species Management

Many Appalachian forests now have well established assemblages of invasive exotic plants, sometimes a dozen species or more, including trees, vines, shrubs, and herbaceous plants. In these unprecedented plant communities, referred to as "novel ecosystems", invasive plant eradication is not practical. Our challenge lies in containing invasives within these novel ecosystems, minimizing their spread and impact on native species, while overall sustaining a healthy vibrant Appalachian forest. To achieve these goals, a strategic approach is needed to maximize positive-impact from the limited resources available to combat invasives species. This is especially true when timber harvests or other disturbances can create additional opportunities for invasive plants to spread.

Forestlands owned by the Biltmore Estate in Asheville exemplify a novel ecosystem, with at least 10 non-native invasive species well established inside a native forest canopy of white pine, white oak, and yellow poplar. This past winter, EcoForesters was hired by the Biltmore Estate to conduct a sustainable timber harvest within 100 acres of this novel ecosystem. Biltmore's objectives were to sustain forest ecological health, but also to generate revenue from the sale of timber and to maintain aesthetics for pedestrian and equestrian users. In determining the best course of action, EcoForesters devised 7 simple principles, the 7 P's of invasives control (see side bar on page 3), to guide our approach towards meeting Biltmore's objectives. Though the work to promote a healthy regenerating forest and combat invasive plants at Biltmore has just begun, we are confident that the strategic application of these seven principles will sustain the ecological health of Biltmore's forests.

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Defining Invasive Exotics And Their Impact on Appalachian Forests

To understand the past, present and future of Appalachian forests it is essential to understand the nature of invasive exotic species. An invasive species is defined by the U.S. Department of Agriculture as "a non-native species whose introduction causes or is likely to cause economic or environmental harm or harm to human health." Exotics frequently become invasive and harmful because of the advantage they have over native species when introduced to a new environment to which they are well adapted, but have no natural predators. Many of the most problematic invasive species for our forests come from eastern Asia, whose forests are very similar to those of the eastern United States.

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Inside This Issue

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(Defining Invasive Exotics continued from front page)

Sadly, there are exotic invasive species that have, are currently, and will in the future adversely impact our Appalachian tree species. American chestnut, formerly the most dominant tree of eastern forests, succumbed to the chestnut blight by the 1950's; Dutch elm disease has ravaged elm trees; Hemlock wooly adelgid has killed most hemlocks south of Massachusetts; emerald ash borer is currently wiping out ash trees in 25 states; American beech are widely infected by beech bark disease; butternuts have been greatly reduced from butternut canker; walnuts are at risk from thousands canker disease; oak trees are in danger from sudden oak death; sassafras is threatened by from laurel wilt; and maples could be overcome by the spread of the Asian long-horned beetle. And while that sums up many of the insects and diseases threatening our tree species, there is also an abundance of invasive plants, such as kudzu, oriental bittersweet, and multi-flora rose to name a few. These plants are smothering thousands of acres of forests, choking out native species and tree regeneration.

Without significant changes in international shipping and forest management policies it is likely that additional devastating invasive insects, diseases, and plants will continue to take root in Appalachian forests. While individual landowners may find it difficult to affect these large-scale policies, pro-active stewardship that maintains a healthy diverse forest is well within our control. EcoForesters is striving to educate and provide services to communities and landowners that maintain healthy forest ecosystems amidst these threats to our forests.

Announcing EcoForesters' Boone Office

Ian Anderson
Forestry Associate
Boone, NC

Ian Anderson is excited to join EcoForesters and expand our mission to the Boone area of North Carolina. Ian was born and raised in Hampton, TN and graduated from Cloudland High School. Ian holds a B.S. in Wildlife and Fisheries Biology from the University of Vermont and a M.S. in Forest Resources from the University of Maine.

Bringing a diverse range of experience to the organization, Ian spent a decade working in Wilderness for the USDA Forest Service, serving as a coastal resource management volunteer in the U.S. Peace Corps and researching landowner engagement in graduate school before joining EcoForesters. Ian is thrilled to be returning home to help landowners steward and protect southern Appalachian forests.

(Novel Ecosystems continued from front page)

EcoForesters staff and board members in the field discussing invasive species mitigation options.

Beyond Biltmore, EcoForesters' plans to use the 7 P's more broadly to achieve our mission of sustaining Appalachian forests, including in our new invasive species control program, sustainable community initiatives such as the Save Sandy Mush campaign, our education and outreach programs, and in the writing and implementation of forest stewardship plans. Sustaining forests with increasing threats from invasive plants in these novel ecosystems is an essential stewardship challenge of the 21st century. Please contact EcoForesters if you would like to learn more about this topic or have your forestland evaluated for invasive plant control.

While actively managing for a healthy forest with today's threat of invasive species, it is important to take a closer look at your forest. As staff member Wade Johnston says, "Just because it's green doesn't mean that it's healthy."

EcoForesters 7 P's for Invasive Exotic Plant Management

1. **Protect** special ecological areas, such as rare, threatened, or endangered species or habitats.

2. **Prevent** invasives from spreading into un-infested "core" forest areas and rapidly respond to new infestations. Secondarily, contain and control more severe infestations.

3. **Plan** invasives control as much as 10 years before and after forest disturbances, such as timber harvesting, that might foster the spread of invasives. Implement forestry practices that promote the ability of native species to compete with invasives over the long haul.

4. **Promote** long-term, community wide education and collaborative strategies to control invasives, as invasive species do not respect property lines.

5. **Prioritize** control of invasives that are the most significant threats to forest regeneration.

6. **Professional** planning by a qualified forester is essential to obtain the most cost effective and impactful results.

7. **Persevere** as invasive species management is a long-term endeavor. Monitor for early detection and rapid response, and reevaluate treated areas and adapt management approaches.

WANTED DEAD

Oriental Bittersweet

Alias: Celastrus orbiculatis

Forest Enemy Number One

Oriental bittersweet is one of the single greatest threats to Appalachian forests. This destructive non-native vine is a forest *killer*. It is very shade tolerant and can thrive in the understory. If a shred of sunlight reaches it, this species will grow very quickly, allowing the vine to cover, shade, outcompete, and kill native vegetation, including trees. Eventually over a long period, without treatment, oriental bittersweet could essentially raze a forest to the ground, killing nearly every plant and preventing native species regeneration.

Popularized in the United States for its ornamental purposes and for erosion control. Its abundant bright colored berries produced in the fall, still popular for wreaths and winter flower arrangements, allow it to be dispersed widely by birds.

Like all invasive plants, the best approach to controlling oriental bittersweet is to catch it early before it spreads, and especially to implement mechanical or chemical control prior to any timber management. Oriental bittersweet spreads rapidly following disturbances that provide more sunlight and growing space. If a timber harvest is planned, we recommend beginning invasive plant control efforts ideally 10-20 years ahead of the anticipated harvest date.

PHYSICAL DESCRIPTION

A deciduous woody vine that, in the spring and summer, has leaves that are alternate, 2 to 4 inches long with rounded or tapered tips. The fruits, which are the most prominent and easily identified feature between September and November, are red, covered in a yellow capsule that splits open when ripe.

Recently spotted in:

- **Canopies of trees**
- **Abandoned fields**
- **Forest edges**

Other Usual Suspects

Tree of Heaven

This species is allelopathic, meaning it kills other species through phytotoxins it releases predominately from its roots.

Multiflora Rose

Typically found along roadsides and streams, usually creating dense shrub thickets, smothering any vegetation below.

Privet

Found in both a shrub form and as a small tree. This culprit takes over the understory of forests as a monoculture, entering through riparian areas as well as forest edge and roads. Prevents native tree regeneration.

Garlic Mustard

Found in the herb layer of the forest, inhibiting the growth of beneficial soil fungi and poisoning native butterfly larvae. One single plant can produce 400-500 seeds that can grow in full sun or in full shade.

The Fall of Appalachian Forests' Greatest Tree: The American Chestnut

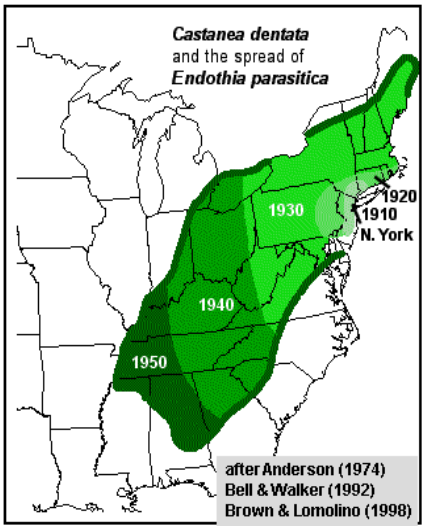
American Chestnut leaves, flower, husk, and nut.

Undoubtedly the most devastating invasive exotic event for Appalachian forests was the chestnut blight, a fungal pathogen introduced from the import of Asian chestnut trees. American chestnuts once towered over the tallest canopies of Appalachian forests from Alabama to Maine. Even more pervasive in Appalachian forests than oaks or hickories are today, American chestnuts were an estimated 25% of trees in the eastern Appalachian Mountains before the blight.

Mature American chestnut trees found in western North Carolina, circa early 1900's

Often measuring several feet in diameter and considered the "Redwoods of the East", these giants provided a variety of goods and services to the ecosystem. American chestnut's nuts were a reliable food source for wildlife, as well as for livestock and human consumption. American chestnut lumber was desired because of its long straight grain and rot resistant wood.

The first sighting of what would be known as the American chestnut blight occurred in New York in 1904. The blight is a fungus by the name of Cryphonectria parasitica, which travels as spores spread by wind. The spores enter the cracks in the bark of a young chestnut tree and eat away at the living tissue of the tree. The blight is visible on the exterior of the bark in the form of a canker. Once the blight took hold in the early part of the 20th century it moved rapidly throughout the forest. By 1950 what was the most dominant tree of Appalachian forests had been almost entirely wiped out.



Map tracking the Chestnut Blight

Today, American chestnuts can only be found as stump sprouts that grow up from the original rootstock of their ancestors. These saplings live until the bark cracks when the young tree grows to 4 to 5 inches in diameter, usually killing the tree within a decade. However, there is hope for blight resistance and reintroduction of chestnuts in the form of blight resistant trees being developed by The American Chestnut Foundation (TACF). EcoForesters is doing its part to assist TACF and one day restore this magnificent tree to our forests.

Spring Landowner Tour on the Warren Wilson College Forest

If you are interested in attending future forest landowner tours, email info@ecoforesters.org or give us a call at (828) 484-6842.

A special thanks to those who attended EcoForesters' recent Spring Forest Landowner Tour! On Saturday, June 2nd forest landowners gathered at the Verner Center in Swannanoa to learn how to ecologically manage their forests for maximizing forest health. After an introduction and overview of forestry practices given by Andy Tait of our Asheville office, we set out to observe the actively managed Warren Wilson College Forest to see what these practices look like when they are applied.

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In Memory of William Landry Painter

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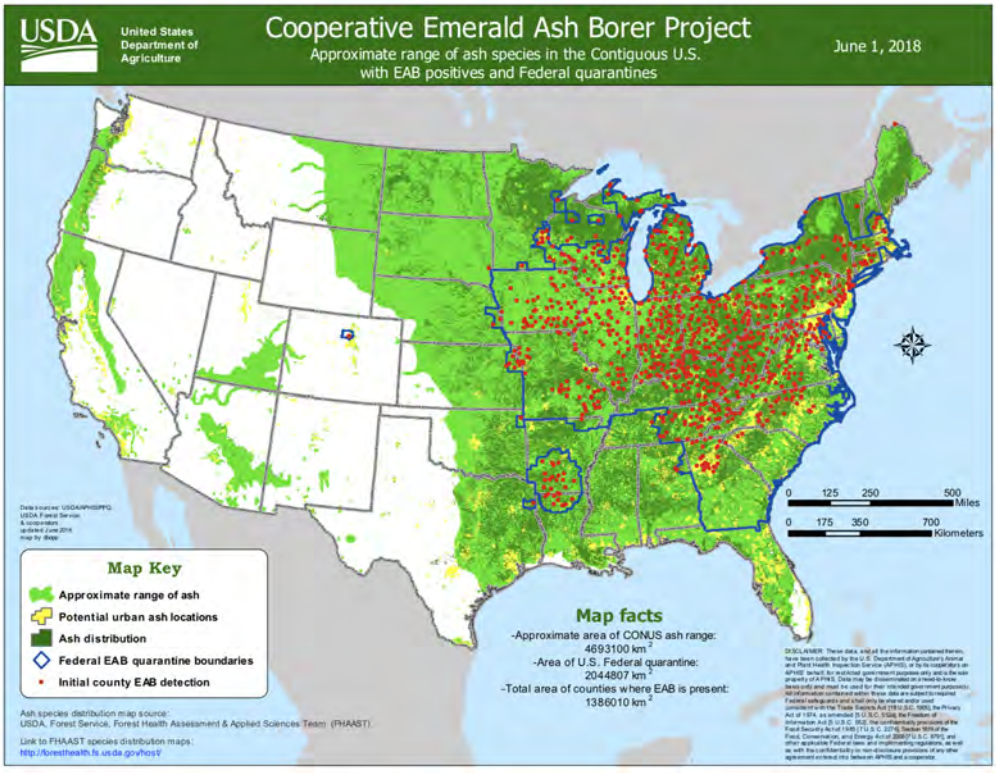
Emerald Ash Borer: Killing our Ash Trees from North Carolina to Vermont

While EcoForesters is primarily based in North Carolina, we are slowly growing geographically. Our northern most office is in Vermont, and while over 1,000 miles apart, our forests have a lot in common, including threats from invasive pests. This was true during the era of the chestnut blight and it is true today. Perhaps the most recent threat to both the northern and southern Appalachian forest is the ash tree killing emerald ash borer (EAB).

Native to eastern Asia, EAB was first reported killing ash trees in Detroit in 2002. Since then, infestations have been found throughout the eastern U.S., first detected in North Carolina in 2013, and in Vermont only several months ago. All species of ash tree are susceptible to the emerald ash borer, and once the insects' populations are sufficiently established, ash trees nearly all die within 2-3 years. Not only are we losing a quintessential tree to Appalachian forests, negative ecological impacts include the spread of invasive plants and reduced soil fertility. Highly valued as both a landscaping tree and for its quality lumber, economic losses are estimated upwards of $100 billion over 25 states. Ash trees can be protected from EAB with pesticides, though the widespread use of this method is not financially practical.

Emerald ash borer

While ash trees are usually scattered in the southern Appalachians, in Vermont they make up 5% of all trees in the state, sometimes occurring in nearly pure ash stands. Both North Carolina and Vermont are expected to lose nearly all their ash trees over the next 10-20 years. EcoForesters is advising landowners with sufficient stands of ash that are located near known EAB locations to harvest their ash trees. Once infested by EAB, ash trees become hazardous, especially to loggers, as the upper limbs of the tree become brittle. There are ecological reasons to harvest ash now too. EAB prefers larger ash trees so harvesting mature ash now allows a new generation of seedlings to take root and become more resilient as EAB passes through.



Emerald ash borer larvae

Pattern underneath bark on ash tree left by EAB larvae

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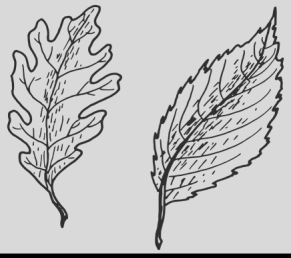
Our Mission

EcoForesters is a 501(c)(3) non-profit professional forestry organization dedicated to conserving and restoring our Appalachian forests.



Keep an eye on your mailbox and email inbox for upcoming EcoForesters events!

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EcoForesters' Invasives Plant Control Program Launch

EcoForesters is working hard leading the strategic management of invasive plants, and this summer we are kicking off our own invasive plant control program. Invasive plant control has always been a key part of our forest stewardship planning. Of the over 250 properties EcoForesters staff has written stewardship plans for roughly 65% have invasive plants. This equates to roughly 45,000 of over 100,000 acres of private land being infested or at high risk, and this is just a small sampling of Appalachian forest landowners. At this scale, it is clear invasive plants are here to stay.

While eradication is impractical, strategic forest stewardship and cost effective invasive plant control is essential for the sustainability of Appalachian forest ecosystems. EcoForesters needs more partners in this important work. Contact us for assistance in your forest or make a generous donation, enabling us to do more, even faster, to combat this growing threat.