

BRANCHING OUT

Maryland's Woodland Stewardship Educator



University of Maryland Extension – Woodland Stewardship Education
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Why Are Native Species So Important?

Natural resource professionals and landowners have a great interest in encouraging native plant species in our woodland over non-natives species for a host of reasons, and it seems the battle can be a fruitless one at times. Many concerns focus on non-native species that are invasive and that outcompete native plants due to faster growth and other characteristics, making it difficult for native trees and shrubs to regenerate or survive.

Non-native invasive species like vine and bush honeysuckle and multi-flora rose have been around for years, but they have upstaged by an even more aggressive suite of characters. The rapid spread of Japanese stiltgrass has raised concern, as it has spread swiftly in many areas of the state, stifling regeneration of native trees and shrubs. And there are others, such as mile-minute, hops, etc. Our native vines, such as grapevine, are often replaced or accompanied by more aggressive non-natives such as oriental bitter-sweet, Japanese honeysuckle, kudzu (in some areas), and slow-growing English ivy. Tree-of-heaven (or ailanthus, shown at right) has been around for a while, but it continues to be an aggressive tree species that can take over an old-field or woodland through root sprouting and rapid growth, especially if there is some type of disturbance.



Another perhaps less obvious reason why non-native species should be a concern has to do with their impact on wildlife populations. Professor Doug Tallamy is the Chair of the University of Delaware Entomology and Wildlife Ecology Department, and he has been studying insects and their role in the environment for over 20 years. He authored the book *Bringing Nature Home: How You Can Sustain Wildlife with Native Plants*. In the book, he shares his research and personal observations that explain how native plants and

vegetation provide the food base that supports native wildlife species. There is a well-developed relationship between native plants, insects, and animals that is healthy, vibrant, and mutually beneficial. For example, the oak leaf hopper eats the leaves of the oak tree and the tent caterpillar eats the leaves of the cherry tree – but neither tree dies. The caterpillars and leaf-eating insects are a source of high protein for small birds and other animals during crucial times, such as immediately after hatching or birthing. This high protein source helps the adult birds and animals find the protein they need to reproduce.

Many homeowners are mistakenly concerned when native trees and shrubs are attacked by leaf-eating insects. They believe they are doing a good deed by planting non-native trees. However, native insects do not eat non-native plants because they have not had the time to develop the ecological dependency found between native vegetation and its fauna. The result is a lack of insects for native wildlife species, which in turn reduces their populations as food availability is a major part of an animal's habitat. While many non-native trees and shrubs may produce food such as berries, they are usually available in the fall and winter. While helpful, native birds and animals require high amounts of protein to grow or reproduce in the spring. The lack of crucial protein sources such as caterpillars and insects at this key time affects wildlife that lives in natural areas as well as migrant birds that count on native food sources to fuel their migration.

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Doug Tallamy's research clearly demonstrates that non-native species do not produce the number or biomass caterpillars or insects compared to native species (Figure 1). This goes for woodlands as well as hedgerows (Figure 2).

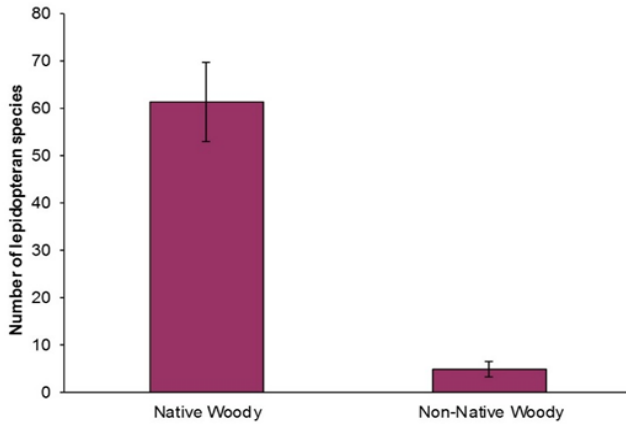


Figure 1

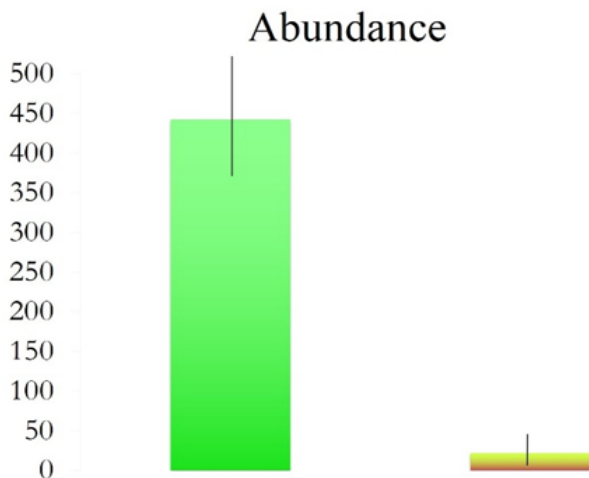


Figure 2

So how does this impact the concern we all have about invasive non-native plant species? It demonstrates the impact is not just on regeneration, but in fact, on wildlife populations as well. And it is not just birds. The diets of spiders, lizard, rodents, fish, skunks, foxes, black bears, and hawks all depend on insects for their diet. Twenty-three percent of the black bear diet is insects and twenty-five percent of the red fox diet is insects. Insects provide a high source of protein.

The faster-growth and aggressive habit of non-native plants is not the only reason they are replacing native species. Overabundant deer populations are a major factor since deer favor native plants for their diet over non-natives. Fencing studies indicate that when deer are excluded or are at very low population levels, natives can actually compete with non-native plants. So the message about non-native plants is not just to control the plants, but to also

take steps to harvest deer to reduce the browsing pressure on native plants.

Hopefully, this gives you renewed vigor to do your best to encourage native species anyway you can – by the plants you plant, the plants you kill, and the reduction of deer populations to acceptable levels.

Welcome Lyle Almond

Lyle Almond is the new Forest Stewardship Educator for University of Maryland Extension at the Wye Research and Education Center (WREC). He comes to Extension after ten years as a forester on the Olympic Peninsula of western Washington. After receiving his MS in Forest Resources Management at University of Washington, he worked for WA DNR as a regeneration silviculturist and as both the forester and restoration ecologist for the Makah Tribe on Washington's northwest coast. He recently completed a Fulbright Exchange in Slovenia, where he studied the European tradition of nature-based forestry. Lyle is looking forward to working with people on projects both within and beyond the University on such initiatives as native woodland restoration, working forest conservation easements, and cultivating woodland medicinal and edible plants. You can reach Lyle at (410) 827-8056 ext. 125 or lalmond@umd.edu.



Did You Know ...

Birds make sounds using an organ called the **syrix**. This organ allows birds to make a wide variety of sounds, which are used to attract a mate, mark territory, or warn others about predators.

Songbirds have a very intricate syrix. They have two sets of membranes that can be controlled independently. This enables songbirds to create two sounds at once. If you've ever wondered how songbirds can chirp and warble at the same time, it's because of their special syrix.

More News about Non-Natives and Invasives

As if we needed further reminders of the need to keep an eye on invasive and non-native species in our woodlands, two recent reports have noted previously-unknown impacts they are having on areas of the ecosystem. One study was undertaken by scientists from Johns Hopkins University's Department of Earth and Planetary Sciences and the Smithsonian Environmental Research Center (SERC). They examined the impact of non-native earthworms on native orchids in woodlands around the SERC campus in Edgewater, Maryland. The scientists showed that non-native earthworms, which find their way into the ecosystem through human activities such as fishing and gardening, can ingest the orchids' seeds in a fashion that prevents them from germinating.

The study focused on the orchid species called *Goodyera pubescens*, which is common in forests along the US east



Goodyera pubescens.
Photo courtesy Smithsonian
Environmental Research
Center

coast, and which grows abundantly at SERC. The scientists found that non-native earthworms ingest the orchid's dust-speck-sized seeds, which fall into the soil surrounding the orchids when the plants flower. As the earthworms eat their way through the soil, they swallow the tiny seeds.

This activity is no different from what native earthworms do. However, the researchers theorize that the non-native earthworms' ingestion process kills the seeds in two ways. The seeds seem to be killed by the earthworms' internal chemistry

or are deposited too deeply for them to access vital fungi nutrients required for their growth.

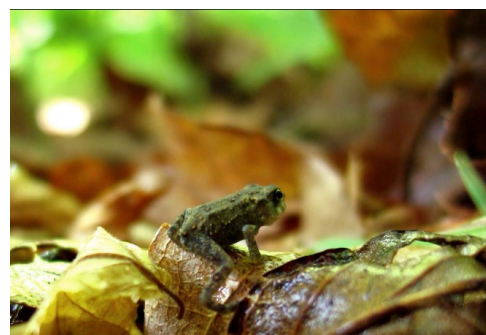
The research team measured the effect of both possibilities and determined that more than three-quarters of the seeds ingested were unable to grow, with a third of them being buried too deep for germination. They concluded that the older woodlands (between 120 to 150 years old) around SERC would lose 49 percent of *Goodyera* orchid seeds to the non-native earthworms, while younger forests (50-70 years old, where non-native earthworms flourish) would lose nearly 70 percent.

The study surmises that these non-natives may also affect the distribution and diversity of the orchid's food source — the fungi in the soil — and therefore may have wider-reaching consequences. Study team member Melissa

McCormick of the Smithsonian notes that many plants depend on these fungi. "Orchids are a way of seeing the health of an ecosystem," says McCormick. "They depend on this very complicated interlinked system, where they depend on things above ground and other species below ground as well, so it's an indication that the ecosystem is pretty healthy when they're there."

While the presence of orchids in a woodland environment may be one way to determine the ecosystem's health, the presence of Japanese stiltgrass is definitely a sign of an ecosystem in trouble. A study by scientists Jayna L. DeVore and John C. Maerz at the University of Georgia's Warnell School of Forestry and Natural Resources postulates a connection between the presence of this invasive grass and the decline of native amphibian species, particularly the American toad.

DeVore and Maerz note that ecosystems invaded by Japanese stiltgrass are nearly completely devoid of native insects, and are also homes to declining toad populations. Scientists had theorized that the toads were in decline because of the lack of insect prey in these invaded habitats, but DeVore and Maerz write that there is another reason: wolf spiders.



Metamorphic American toad in open, uninvaded forest floor habitat. Photo courtesy J.L. DeVore

The dense carpet of stiltgrass provides security for the arachnids. DeVore and Maerz studied plots of invaded forest floor, and concluded that "it is increased spider persistence that reduces toad survival in invaded habitats."

The scientists are now going to examine the possibility that other amphibians are being similarly affected.

To read more about non-native earthworms and orchids, visit <http://www.smithsonianmag.com/smithsonian-institution/earthworms-a-nightmare-for-americas-orchids-14692993/?no-ist>. To learn more about Japanese stiltgrass, toads and spiders, go to <http://www.esajournals.org/doi/pdf/10.1890/13-1715.1>.

In the Aftermath

Jenny McGarvey
Chesapeake Forests Program Manager,
Alliance for the Chesapeake Bay

Among the top concerns for woodland owners is the threat of invasive insects and plants to their woods—and for good reason. Invasive insects may weaken and kill native canopy trees, and invasive plants can outcompete native seedlings in the understory for light and water resources. Independently, they endanger overall forest health and prevent future regeneration of woods, but together can invasive insects and plants also facilitate each other's success?

A recent study in the journal *Ecology* reveals that short-lived outbreaks of gypsy moth, an exotic insect pest, may have a rapid and long-term impact promoting the success of aggressive exotic plants. Drs. Anne K. Eschstruth and John J. Battles reached this conclusion after following the invasion dynamics of garlic mustard, a biennial herb, and Japanese stiltgrass, an annual grass, following a canopy defoliation event by gypsy moth during the summer of 2006 at the Delaware Water Gap National Recreation Area in northeastern Pennsylvania and western New Jersey. The canopy recovered completely after only two to four weeks

following gypsy moth defoliation; however, the brief window allowed garlic mustard and Japanese stiltgrass to invade. Six years later, the effect of the gypsy moth outbreak was still clearly evident with garlic mustard abundance increased by 59% and Japanese stiltgrass by 42% from pre-disturbance levels. That means a seemingly minor disturbance to a forest canopy may have devastating, long-term impacts for the understory.

As a landowner, how can you prepare yourself and your woodlands for sudden pest and invasive plant outbreaks? It all starts with a Forest Stewardship Plan that lays out strategies to help you achieve your goals while keeping your woods healthy. You can visit the [Forests for the Bay website](#) to help you get started in connecting to resources and professional assistance. By managing your land in such a way that promotes the success of native tree seedlings and removes invasive plants, you can better protect your woods against the unexpected.

Ecosystem Services on Forest and Agricultural Lands of Maryland: A Survey of Maryland Tree Farmers and Agricultural Landowners

Bob Tjaden, University of Maryland, Department of Environmental Science & Technology
Adan L. Martinez-Cruz, University of Maryland, Department of Agricultural Resource Economics
Seth Wechsler, University of Maryland, Department of Agricultural Resource Economics
Richard Pritzlaff, Biophilia Foundation

Maryland contains 2.4 million acres of forestland; 75% or 1.8 million acres is family owned. These private forest landowners, numbering an estimated 130,800, own 78% of the forestland, with an average size holding of 17 acres; 75% of these landowners, however, own less than 10 acres. These private forestlands protect and supply more than two-thirds of Maryland's drinking water.

There are 12,834 agricultural farms in Maryland, covering 2.1 million acres; 1.5 million acres are devoted to crops, with over 62,700 people employed in agriculture. Maryland farmers are aging, reflecting a national trend. The average age of Maryland farmers is 55.8 years, compared to the U.S. average of 53.3 years. These farms and those who work them hold the key to many ecosystem services.

Maryland's forests and farms provide valuable ecosystem services to the state and to the Chesapeake Bay region. Ecosystem services produce many natural resources: clean water, clean air, timber, habitat for fisheries, flood control, and the pollination of agricultural plants. These en-

vironmental functions are essential to sustaining all life on earth.

Until recently, few studies have explored landowners' knowledge and understanding of the term ecosystem services and whether or not landowners would agree to participate in a payment-for-ecosystem-service (PES) program. Our survey explores the extent to which agricultural landowners and tree farmers understand what ecosystem services are. We attempted to determine what specific attributes would affect farmer participation in PES programs in Maryland, such as monetary incentives, financial entry points that would draw farmers into a program, who farmers would trust entering into a program contract with, and contract lengths.

Our original intent was to perform a telephone survey; however, with the challenges of some families disconnecting home phones in favor of using individual cell phones, our inability to acquire cell phone numbers, and advice from experts in survey methodology, we decided to perform a

mail survey.

We obtained the Maryland Tree Farm's mailing list from the American Forest Foundation with the understanding that the list would be used one time, for this research project only. We obtained addresses for over 1,000 Maryland tree farmers. After eliminating duplicates for the same farm, only one recipient per tree farm was sent a survey, resulting in 878 tree farmers selected to receive the survey.

We also obtained the names and addresses of agricultural landowners (with farms larger than 100 acres) from the Maryland Department of Planning's property view database. Using a similar methodology as for the Tree Farm database, a total of 1,108 agricultural landowners were selected to receive the survey.

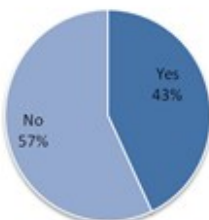
The surveys, consisting of 33 questions, were mailed in April 2012. The mailings included a prepaid, self-addressed envelope, as well as the opportunity to complete the questionnaire on-line. Of the 1,986 surveys mailed, there were 536 responses; 516 of these responses were fully completed. This is a response rate of 28 percent. Only 47 (9%) of respondents completed the survey on-line. We believe that the distribution of returned completed surveys reasonably represents a reasonable approximation of Maryland's agricultural landowners and tree farmers.

The majority of the respondents were male, with an average age of almost 67 years. Over 50% of respondents have a college education. Notably, 41% report an annual household income of more than \$100,000. However, only 15% claimed that the majority of their income comes from their land. Tree farmers represented 56% of the completed surveys.

Heard Term Ecosystem Services Before This Survey



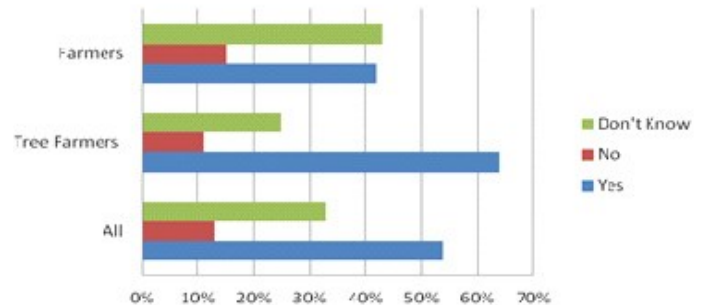
Heard Term Ecosystem Services Before this Survey



The findings indicated that fewer than 50% of the respondents were familiar with the term ecosystem services. (See results at left.) Question 13 asked those who had heard of the term to describe what the term meant to them. The respondents indicated that the term was most frequently associated with the preservation of wildlife habitat and the purification of air and water.

Question 14 asked whether respondents would consider participating in a PES program. Generally speaking, respondents seemed willing to consider participation. The majority of respondents would consider participation (54%), while only 13% would not. Approximately one-third of respondents were unsure what they thought about participating in PES programs.

Willingness to Participate in a PES Program



Notably, there seemed to be major differences between tree farmer and agricultural landowners. Sixty-four percent of tree farmers were willing to consider participation in PES programs, while only 42% of agricultural landowners were willing to consider participation. This suggests that there may be fundamental differences between tree farmers and agricultural landowners. These differences may be ideological or stem from misinformation. Further work is needed to determine whether educating agricultural landowners about ecosystem services could increase their willingness to consider participation in PES programs.

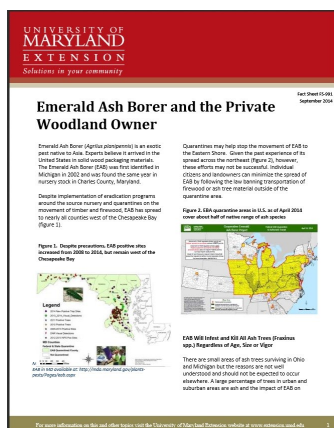
The survey's evidence suggests that having heard of or being familiar with the term increases the possibility of participation in PES programs. The most important reason to reject participation in a PES program is lack of information. This suggests that educational programs could increase knowledge about ecosystem services and acceptance of PES programs.

A summary of our findings can be found on the Woodland Stewardship Education website's Publications Library at <http://extension.umd.edu/sites/default/files/docs/programs/woodland-steward/Ecosystem%20Services%20Survey%20Digest.pdf>.

The full report is also available on the website at http://extension.umd.edu/sites/default/files/docs/programs/woodland-steward/Ecosystem_Services_on_Forest_and_Agricultural_Lands_of_MD_Final_Report.pdf.

New EAB Fact Sheet Available

The University of Maryland Extension's Woodland Stewardship Education program has a new fact sheet available. FS-991, "Emerald Ash Borer and the Private Woodland Owner," summarizes the state of EAB infestation in Maryland and provides ways to identify EAB infestation. Although EAB cannot as yet be eradicated or controlled, there are a variety of strategies that can minimize the impact on your woodlands. This fact sheet shares tips and techniques for managing woodlands affected by this invasive and destructive insect.



This new fact sheet is available from the Publications Library at the program's website. Go to <http://extension.umd.edu/woodland/your-woodland/publications-library> and select the "Invasive Species" category.

Rising Wood Pellet Demand in Europe Means Boom for Exporters

Rising consumption of wood pellets in European nations for heating homes and small-scale power generation plants is outstripping the continent's production capacity. According to the US Department of Agriculture, consumption is expected to rise 14% to 22 tons this year, which is more than double the levels of five years ago.

The US alone, which shipped 3.05 million tons of pellets, worth \$374 million, to the European Union last year, could see the value of its shipments to the region top \$1 billion by 2020, the USDA said. The rise in exports is driving a surge in pellet production capacity in North America, with output tripling in the last three years in the south.

Read more at <http://www.agrimoney.com/news/rising-eu-wood-pellet-use-drives-surge-in-imports--7246.html>.

Expanded Publications Library on WSE Website

The Publications Library of the Woodland Stewardship Education program website has a new section devoted to Ecosystem Services. This section collects several reports authored by Dr. Robert Tjaden, the Principal Agent of the Department of Environmental Science and Technology. Bob has worked with Extension since 1988, conducting research into a wide variety of forestry-related issues. His current research includes determining the interests of Maryland tree farmers and agricultural landowners concerning payment-for-ecosystem-service programs.

Learn more about ecosystem services by visiting the new section of the website at <http://extension.umd.edu/woodland/your-woodland/ecosystem-services>.

2014 Collaborative Wood Stove Design Workshop

The Alliance for Green Heat announced that their workshop, to be held at Brookhaven National Laboratory in New York November 4-7, has drawn entries from the US, Denmark, Germany, New Zealand and China. Participants include experts from manufacturers and universities. The workshop will involve hands-on testing of the seven stoves entered, daily review of test data, and presentations by participants and other experts.

The workshop is the second phase of the Wood Stove Design Challenge, following last year's Wood Stove Decathlon (which was covered in the Fall 2013 issue of Branching Out, available at http://extension.umd.edu/sites/default/files/docs/newsletters/2013_vol21_no4_0.pdf). The workshop is being sponsored by the Alliance for Green Heat and Brookhaven National Laboratory, with primary funding from the NY State Energy Research and Development Authority, the Osprey Group, and the US Forest Service.



EAB Found in Four More Virginia Counties

Chris Graham, Augusta (Virginia) *Free Press*

The Virginia Department of Agriculture and Consumer Services announced in August the detection of Emerald Ash Borer (EAB) in additional counties in the Commonwealth; the newly infested counties include Alleghany, Bath, Fauquier and Page.

EAB has now been detected in 21 Virginia counties and seven cities since its initial appearance in Fairfax County in 2003. The entire Commonwealth of Virginia is under a federal EAB quarantine. The federal quarantine prohibits the interstate movement of regulated articles such as ash logs, ash nursery stock and firewood since these articles have the potential to move the Emerald Ash Borer to areas that are not infested. Even though these articles can move freely within the state, Virginians can take steps to prevent the spread of EAB to additional cities and counties in the Commonwealth. For example, VDACS encourages campers to buy firewood at the local camp site and burn it there rather than transporting it to the camp site from distant locations.

EAB is a highly destructive, invasive beetle that has killed millions of ash trees in the US and Canada. Ash trees comprise approximately 1.7 percent of Virginia's forests by volume, which amounts to roughly 187 million ash trees, all susceptible to EAB. "The presence of the Emerald Ash Borer in Virginia threatens the loss of all ash trees in the Commonwealth," said Sandy Adams, VDACS' Commissioner. "Even though the federal quarantine allows the movement of regulated articles within Virginia, we urge all Virginians to do whatever they can to stop the spread of EAB and other invasive pests."

Dr. Chris Asaro, forest health specialist with the Virginia Department of Forestry said, "Options for protecting individual ash trees from EAB are available. People with very large, valuable ash trees would be advised to contact a certified arborist who can treat these individual trees with an effective insecticide every two to three years. Treating these valuable trees is far less expensive than removing a very large, dead tree. Unfortunately, there are no practical management options for EAB in a forested setting."

The U.S. Department of Agriculture website shows a map of quarantined states and areas at aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/downloads/multistateeab.pdf. More information on EAB and other invasive pests is available at <http://www.hungrypests.com/>.

Maryland Emerald Ash Borer Survey

In August, the Woodland Stewardship Education program invited Maryland's foresters to participate in a survey about the presence of Emerald Ash Borer (EAB) as experienced in their profession. The survey invitation was sent to a mailing list of 148 state, consulting and industrial foresters across the state; the invitation resulted in an 11% response rate. Despite the low return, the survey yielded several worthwhile results.



Maryland state foresters were the largest respondents, accounting for 71% of those who participated. Consulting foresters accounted for

the remaining 29%; no industrial foresters replied. Of those who participated in the survey, 88% characterized themselves as "knowledgeable," "very knowledgeable," or "extremely knowledgeable" about EAB. However, only 60% of respondents said they had seen ash mortality due to EAB during their work in Maryland's woodlands.

The survey invited the participants to select from a list of Maryland counties to indicate where they had encountered EAB. Allegany and Washington counties received the most votes, followed by Garrett County. Charles and Frederick counties were also selected. No counties east of Charles County were selected.

Further questions asked how the professionals were approaching EAB infestations. Seventy-three percent noted that they had recommended a proactive removal of ash trees. Nearly two-thirds (63%) had recommended removal on properties less than 20 acres. Other respondents noted that they had recommended removals on large, publically-owned land and on tracts of over 100 acres. Interestingly, the percentages were exactly reversed in response to the question, "Have you conducted a proactive removal or harvest of ash trees?" as 63% replied "No."

Finally, the respondents were asked to select from a list of five EAB online resources they had visited. The [Maryland Dept. of Natural Resources EAB page](#) was the most popular (88%), followed by [USDA Forest Service Forest Health Protection's EAB page](#) (69%) and [emeraldashborer.info](#) (63%).

Join the YardMap Project to Create Bird Habitat

Joe Schwartz, Cornell University

The backyard is far more than a place to install a pool, hold a barbecue, or toss a Frisbee. The sum of all North American yards and neighborhood green spaces equals major habitat for birds and other wildlife. Creating larger, connected patches of bird-friendly habitat is one goal of the YardMap citizen-science project from the Cornell University Lab of Ornithology. The project has undergone extensive testing by 10,000 users who created more than 6,700 maps. YardMap is ready for everyone and is now inviting new participants to join.

“People often think their yard is too small or too urban to impact wildlife, but that just isn’t true,” says YardMap project leader Rhiannon Crain. “For many plant and animal species a yard can mean the world. A butterfly can live its whole life from egg through caterpillar to butterfly in one person’s yard, so it matters quite a lot if the owner uses pesticides.”

After signing up for the free online project, participants zoom in on satellite images to construct maps of their yards, local parks, workplaces, local cemeteries, or any other green space they know well. They mark the maps to



show areas of lawn, buildings, native plants, feeders, and other landscape features. Scientists and participants can see how the spaces connect to form larger landscapes and share information about improving habitats at home and across communities. By pairing habitat information with bird sightings, participants learn about the effects of different gardening practices at a much larger scale.

Changes don’t need to be dramatic.

Putting in a few native plants, being aware of windows when locating feeders to reduce deadly collisions, or creating a brush pile birds can use to escape from predators can all have a significant impact for local birds.

“Right now we’re losing 21 million acres of habitat every 10 years to residential development,” says Crain. “But we also know there are millions of people out there concerned about the environment, ready to tread more lightly on the land. Even if you’re just starting your wildlife garden, we’d love to share the journey as you document your progress with YardMap.”

For more information, see: <http://content.yardmap.org/>

A Tree Planting Laboratory at Monocacy

The Monocacy Natural Resource Management Area (NRMA) is a publically held 2100-acre property tucked away in southern Frederick, but for the last 17 years it has become a focal area for field trials to demonstrate tree planting techniques. In the late 1990’s the enhancement of water quality became a major initiative in Maryland, and the planting of areas around stream corridors, known as riparian areas, a major focus. The MNRMA, which abuts a section of the Monocacy River along with many smaller drainages, had over 1000 acres of agriculture fields, many with steep slopes, that could be reforested to help reduce erosion and water pollution, improve wildlife habitat, produce forest products in the future.

A comprehensive management plan was prepared in 2001 as part of a partnership with state, local, and federal agencies and organizations. It identified tributaries of the Monocacy River and steep slopes presently used for cropping or grazing that would be prime candidates for reforestation. Significant funding has come from a number of sources with the majority from the Frederick County Fee in lieu form the Forest Resource Ordinance. Of the total 386 acres tree

planted, about 340 acres of trees have been planted since 1998, along with 20 acres of warm season grasses. This is a dramatic increase in the riparian buffer forest area which translates into improvements in water quality and wildlife habitat.

Hailu Sharew was hired in 1998 as a forester with the MD DNR Forest Service and he has been the point person for the reforestation efforts. He is quick to point out that this has been a truly collaborative effort and many other foresters and organization have been involved, but when you want to know the specifics of what is going on at the Monocacy Project, you end up talking with Hailu.

Tree planting is not a new idea when it comes to pine trees, but the planting of hardwood trees in agriculture fields used on the Monocacy Project was not a widespread practice at the time and there was much to learn. Overabundant deer and the browsing damage are a major impediment to reforestation success so protection of the newly planted hardwood seedlings is accomplished with tree shelters and fencing. But tree shelters have their own set of issues -

they are expensive, come in different shapes and sizes, and require maintenance. Fencing systems can be effective in excluding deer but the extremely high deer pressure in the Monocacy NRMA can test the limits of fencing and tree shelters.

Voles are small rodents that are present in or around many old agricultural fields and while they eat green tissue in summer, they eat woody tissue in the fall and winter, which can cause significant mortality to hardwood trees. The importance of monitoring a potential planting site for voles and the judicious use of rodenticide and the control of vegetation were the target of other studies.

What follows is a brief description of the various field trials over the last 17 years and sources of more information:

- 1999 – 2001: Field trails compared seedling growth and light transmission among different types of tree shelters. The results are available at: http://caswellfp.com/Articles/MD_TreeShelters.pdf
- 2001– 2002: Different vegetation management/herbicide treatments (mowing, herbicide, and rodenticide) were used in a young planting with high vole populations to determine what worked best. All the treatments were effective, but it was important to monitor vole populations and take swift action if needed. The results are available at: http://www.dnr.state.md.us/forests/download/vole_damage.pdf .
- Series of trials on deer damage protection:
 - 1999 – 2004: Evaluated the effectiveness of deer repellent spray and Bitrex® (denatonium benzoate) tablets during the 1999 and 2003 trials, respectively, as deer repellent, but both treatments were ineffective.
 - 2003 – 2007: Evaluated different tree shelter designs for ease of installation, effectiveness, maintenance, and disposals. Considerable differences were observed among tree shelter designs. Pre-assembled double-walled shelters were sturdier, easier to install and maintain, and easy to dispose of compared to single-walled shelters or unassembled shelters that fold at the tie point and that damage seedlings when they become malleable during hot weather.
 - 2003 – 2007: Various studies evaluated the effectiveness of the standard 4-foot tall tree shelters and 7.5



DNR Forester Hailu Sharew stands among trees planted in 2001.

foot black plastic deer fencing supported by pressure treated posts and/or black angle steel fence posts at different locations. Deer pressure was high enough that trees shelters did not protect seedlings emerging from shelters while the deer fences did. The metal fence posts needed replacement due to rust and fracture compared to the pressure treated lumber fence posts.

- 2008–2011: Field trials evaluated the use of standard 7.5-ft tall plastic deer fencing using pressure treated posts on smaller (1 to 1.5 acres) and large (16-acre) blocks. The 7.5-ft tall plastic fence did exclude deer from the smaller fenced blocks, but deer started to break through the plastic netting and jump over the large block's fencing. The fence on the large block was raised to 9 feet and the fence material upgraded to sturdier materials in 2011. The site was replanted in 2012 and the 16-acre area now excludes the deer.
- 2011–2013: Field trails evaluated the impact of 5 and 6-ft. tall single walled shelters on tree seedling growth and deer protection. Sections of the unsuccessful tree plantings from 2004 and 2010 using 4-ft tall shelters were replaced with 5 and 6-ft. tall shelters. The 6-ft tall vented shelter protected the seedling from deer, but the 5-ft tall shelter did not. The use of 6-ft tall shelters is presently being evaluated at different sites (about 97 acres) since 2012. These shelters, however, are subject to folding at the tie point and to wind-throw due to heavy growth, and require regular maintenance to keep fallen tree shelters upright.
- 2014: A 9-ft tall woven wire fence using pretreated lumber posts was installed in the 8-acre plantation area. The fence continues to exclude the deer.



Overall, the field trials indicate the success of planting hardwood trees depends on the size of the plantation area, location and associated deer pressure, and the height and material of the fence and/or shelter used. In summary:

- While a 7.5 ft tall plastic deer fence may be suitable for smaller areas of 1-1.5 acres, large areas will require a taller fence (probably 9-ft tall) and construction of sturdier materials to repel entry.
- Four-foot tree shelters may protect trees in areas with low deer pressure, however, as deer pressure increases or more trees are planted, 5 or 6-ft shelters may be

needed. Otherwise, the deer will continually browse the tree tips and trees will not grow beyond the reach of the deer.

- Six-foot vented single-walled tree shelters protect trees from deer browse and increase growth above “deer-browse-height” over shorter shelters in areas with high deer pressure, but require sturdier shelter and strong stakes to reduce maintenance cost.
- Preassembled double-walled shelters are sturdier, simple to install with minimum maintenance, uncomplicated to reassemble, and dispose of after the job is done.
- A planting site should be monitored for voles prior to planting and if needed a combination of rodenticide (applied in September) and vegetation management practices implemented. Voles are capable of killing a majority of trees beginning the first fall/winter after planting.
- The success of plantation establishment depends on the size and location of the planting. The survival and growth of trees close to residences and main roadsides was higher, even with the smaller 4-ft shelters, compared to more remote areas.
- Fencing larger areas can be more cost-effective than the use of tree shelters, especially if the fenced areas are rectangular in nature and limit the amount of perimeter. Fenced areas also allow a diverse group of vegetation to develop. While tree shelters will protect the tree from deer, all other vegetation will be impacted.
- Although the use of 6-ft tall shelters initially cost more per acre than 4-ft shelters, gains in seedling survival and growth may offset the additional cost and translate into lower establishment costs overall.



A variety of fencing and tree shelter studies are found at Monocacy NRMA

Landowners and managers have to be cautious when applying the results of field trials at the Monocacy NRMA to other properties. Deer pressure is a major factor that impacts the results of this work but the lessons learned can be useful. A final report on the project results since 2003 is being prepared. In 2014 other ongoing studies include the use of tree shelters on pines and spruce species, the effectiveness of biodegradable shelters, weed management, and a silvopasture demonstration trial. For more information contact Hailu Sharew at hailu.sharew@maryland.gov.

Threatened Beetle Protected by Girl Scouts of the Chesapeake Bay

wboc.com (Salisbury, Maryland)

Girl Scouts of the Chesapeake Bay are working together to protect a threatened beetle on Maryland’s Eastern Shore.

Puritan tiger beetles have declined in population size and distribution in their Chesapeake Bay range. According to the Chesapeake Bay Field office of the U.S. Fish and Wildlife Service, the remaining Chesapeake Bay populations are highly susceptible to habitat loss or degradation.



Puritan Tiger Beetle. Photo courtesy US Fish and Wildlife Service

The Girl Scouts of America organization say more than 170 acres on Girl Scouts of the Chesapeake Bay’s Camp Grove Point in Earleville, Maryland, is protected with a conservation easement that puts the recovery of the beetle within reach. The property’s 2,200 feet of eroding cliffs at the mouth of the Sassafras River provide the unique habitat needed by the beetle, says wildlife officials.

“We are taking a significant step forward in recovering the Puritan tiger beetle, whose largest global population is found in the Chesapeake Bay in Maryland,” said Genevieve LaRouche, Supervisor, U.S. Fish and Wildlife Service Chesapeake Bay Field Office. “This partnership illustrates the important role of local groups and landowners in the conservation of our rare native wildlife.”

The Girl Scouts of the Chesapeake Bay say that for many years, the Girl Scouts have acted as caretakers for the beetle population at Camp Grove Point and have received hands-on education regarding the Puritan tiger beetle and other Chesapeake Bay wildlife. They say, every year, hundreds of Girl Scouts attend day and residential summer camps and participate in troop camping throughout the year.

“Good stewardship of our land is an important part of Girl Scouting,” said Anne T. Hogan, CEO of Girl Scouts of Chesapeake Bay.

“Rich with diverse wetlands and upland forests of oak, tulip poplar, beech and hickory, the new easement will permanently protect the area’s sensitive ecosystem,” said Maryland Department of Natural Resources Secretary Joe Gill. “By preserving this critical landscape we can help guarantee the future of the Puritan tiger beetle, as well as an array of wildlife including osprey, eagle, deer, fox and many migratory songbirds.”

Wildlife officials say permanent protection of this land will help stabilize six large sub-populations and their habitats in the Chesapeake Bay. This will meet one of the federal criteria required for recovery of this species. With the protections on the Girl Scout property, wildlife officials say four sub-populations will be protected in Maryland.

“Preservation of this property not only means protection of a unique ecological site,” said Jared Parks, Eastern Shore Land Conservancy Land Protection Specialist. “It preserves a place where generations of girls can go to explore

the outdoors and learn about nature with a great organization devoted to building character and strength.”

According to the U.S. Fish and Wildlife Service, development and stabilization projects are the most serious threats to this species in Maryland. Puritan tiger beetles undergo their entire life cycle on or near cliffs and adjacent sandy beaches, and require some cliff erosion to maintain suitable habitat conditions. Shoreline stabilization structures minimize erosion at the base of the bluff, which over time makes the slopes less steep and allows vegetation to grow. This makes the habitat unsuitable for the beetles.

The Girl Scouts of the Chesapeake Bay, partners with the Eastern Shore Land Conservancy, Maryland Department of Natural Resources Program “Open Space” and U.S. Fish and Wildlife Service Chesapeake Bay Field Office to conserve the Puritan Tiger Beetle’s habitat.

Events Calendar

For more events and information, go to <http://extension.umd.edu/woodland/events>

October 14, 2014

12:00 PM—1:00 PM

Making the Grade: Trees to Lumber webinar

Online through Penn State Extension

The “Making the Grade” webinar presents basic information and is intended for small woodlot owners, farm woodlot owners, public and municipal forest land managers, and other interested parties to help them better understand the forest resource they own and/or work with. The presentation will show the relationship between lumber grades, log grades and tree grades with respect to estimating the quality and quantity of lumber which one may expect to recover from the board, log, or tree, respectively. Presented by Lee Stover, Lead Consultant, L & E Stover Enterprises, Inc. There is no cost but pre-registration is requested. Go to <http://extension.psu.edu/natural-resources/forests/events/making-the-grade-trees-to-lumber-noon-webinar> for more information and how to register.

October 21 2014

9:30 AM—4:00 PM

Champion Tree Tour

Montgomery County, MD

Join Joe Howard of the Montgomery County Forestry

Board and Montgomery Parks Forest Ecologist Carole Bergmann for a tour of champion trees around Silver Spring. The \$45.00 registration fee includes transportation and drinks. Go to <http://www.montgomeryparks.org/calendar/index.php?eID=3013> for more information.

October 25 ,2014

8:30 AM—1:00 PM

Tree Farm Tour—Eaton Trust Lands

Kent County, MD

The Maryland Tree Farm Committee is sponsoring a tour of the Eaton Trust Lands, located in Kent County, north of Chestertown. Topics covered include easements and trusts, effective logging practices, and dealing with invasives in the forest. For more information, contact Teri Batchelor at 410-819-4121.

November 6 ,2014

7:00 PM—9:00 PM

Learning How to Heat With Wood & Pellets ... Save Money & Be Warm!

Garrett Community College, McHenry MD

Do you heat with oil, propane, or a heat pump, but want to know more before heating with wood or pellets? Is the high price of oil and propane and the prediction of another cold winter getting you down? Perhaps you are interested in an inside stove or an outdoor wood boiler. Advances made in wood burning technology have dramatically improved efficiency and reduced emissions of residential stoves. Firewood is one of the most economical

forms of renewable energy available today. Better yet, the Maryland Energy Administration also has a wood grant program that will pay \$500 toward the cost of a clean-burning wood stove and \$700 toward pellet stove. This workshop will provide you the resources to help the beginner or the experienced wood user. Registration is \$5.00 per person. For more information, contact Susan Coddington at susanp@umd.edu or call 301-334-6960.

*November 11 and November 18, 2014 (Two evenings)
6:30 PM—9:00 PM*

The Woods in Your Backyard Workshop

Montgomery County Extension Office, Derwood, MD

Are you interested learning how better manage the natural areas on your property or convert some lawn into natural area? If so, you are invited to participate in the upcoming “The Woods in Your Backyard Workshop” to be held from 6:30 – 9:00 p.m. on Tuesday evenings, November 11, 2014 and November 18, 2014 at the University of Maryland Extension, Montgomery County Office. This hands-on workshop is designed to provide the basics of woodland and wildlife management for small acreage property owners. Participants will learn how to make their woodlands work for them and develop a plan for their property. Landowners of just a few acres can make a positive difference in their environment through planning and implementing the stewardship practices discussed. The workshop will include a combination of presentation and small group activities. The registration fee for the two-night course is \$35 per individual. Workshop participants will receive a full-color 130-page guide, *The Woods in Your Backyard: Learning to Create and Enhance Natural Areas Around Your Home*, as a program reference, as well as other resource materials. For more information, contact Chuck Schuster by phone 301-590-2807, or email, cfs@umd.edu. Registrations are due by Friday, November 7, 2014.

*November 8, 2014
9:00 AM—4:30 PM*

Agroforestry Workshop

Lord Fairfax Community College, Warrenton VA
(Fauquier County)

The day-long workshop will focus on agroforestry riparian buffer and silvopasture systems. Experts from both the private and public sector will answer questions and landowners will share their experiences with these practices. The workshop costs \$15.00 and includes lunch. For more information and how to register, go to <http://forestupdate.frec.vt.edu/landownerprograms/workshops/agroforestryworkshop/index.html>.

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