

The New York Forest Owner

A PUBLICATION OF THE NEW YORK FOREST OWNERS ASSOCIATION

For people caring about New York's trees and forests

September/October 2019



Member Profile: Scott and Donna Bonno

Volume 57 Number 5



**THE NEW YORK
FOREST OWNERS
ASSOCIATION**

Officers & Directors

Art Wagner, President
49 Clayton Blvd Apt 222
Baldwin Place, NY 10505; (914) 519-6216
awagbx@aol.com

Stacey Kazacos, Vice-President
305 Jacobsen Road
Mt Vision, NY 13810; (607) 293-8195
stacey@sent.com

Ed Neuhauser, Secretary
434 W Groton Road
Groton, NY 13073; (607) 898-3614
edward.neuhauser@gmail.com

Peter Tonetti, Treasurer
4884 E Lake Rd
Cazenovia, NY 13035; (315) 655-5733
pjtonetti@gmail.com

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Art Wagner, Baldwin Place, (914) 519-6216
Frank Winkler, Andes, (845) 676-4825
Darryl Wood, Binghamton, (607) 648-3896

Liana Gooding, Office Administrator
PO Box 541
Lima, NY 14485; (800) 836-3566
lgooding@nyfoa.org

Peter Smallidge, Ex-Officio Board Member
Cornell University, Fernow Hall
Ithaca, NY 14853; (607) 592 3640
pjs23@cornell.edu

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The New York Forest Owner

A PUBLICATION OF THE NEW YORK FOREST OWNERS ASSOCIATION

VOLUME 57, NUMBER 5

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Please address all membership fees and change of address requests to PO Box 541, Lima, NY 14485. 1-800-836-3566. Cost of family membership/subscription is \$45.



NYFOA
New York Forest Owners Association

www.nyfoa.org

COVER: Front cover. Scott and Donna Bonno on their property. For member profile see page 21. All photos courtesy of A. J. Sharlow.

From The President

NYFOA has been very active throughout this summer season. Many woodwalks and forestry related programs were organized by our statewide chapters. The topics included forest pests, forest regeneration, timber harvests, invasive species, managing for wildlife and birds,



young forest initiatives, legacy planning, and more. Most of these events can be easily found at the NYFOA website www.nyfoa.org/events.

In addition to the expert presenters, I have personally found that speaking with other participating forest owners often provided practical advice on choosing the best practice based on actual on the ground conditions. Also, often times, grants and funding opportunities for certain forestry practices are identified. These opportunities can help off-set some of the expenses that may be needed to implement the recommended silvicultural practices. Time spent participating in these programs will be time well spent.

The New York State Department of Environmental Conservation has recently taken the lead in crafting New York's 2020 Forest Action Plan. The Forest Action Plan is a 10-year strategic plan for New York's forestry community. Under the federal farm

bill, every 10 years each state must submit a Forest Action Plan to the US Forest Service in order to qualify for federal funding. The purpose of the Forest Action Plan is to provide long-term, comprehensive, coordinated strategies to help the forestry community refine how it invests state, federal, and leveraged partner resources in major management and landscape priorities. NYFOA will be a participating partner helping to advise NYS DEC with this project. Additional information can be found at www.dec.ny.gov/lands/60829.html

Please join the Capital District chapter on Saturday September 28th from 10 am – 3 pm at John Boyd Thacher State Park as they host our state-wide fall symposium "Managing Your Woodlot for Wildlife." Three nationally renowned speakers will be presenting the most current best practices for managing forests for wildlife and regeneration. Please see page 17 in this issue for further information.

"The best friend on Earth of man is the tree: When we use the tree respectfully and economically, we have one of the greatest resources of the earth"

- Frank Lloyd Wright

-Art Wagner
NYFOA President

The mission of the New York Forest Owners Association (NYFOA) is to promote sustainable forestry practices and improved stewardship on privately owned woodlands in New York State. NYFOA is a not-for-profit group of people who care about NYS's trees and forests and are interested in the thoughtful management of private forests for the benefit of current and future generations.

Join! NYFOA is a not-for-profit group promoting stewardship of private forests for the benefit of current and future generations. Through local chapters and statewide activities, NYFOA helps woodland owners to become responsible stewards and helps the interested public to appreciate the importance of New York's forests.

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a neighbor and urge them to join
NYFOA.

By gaining more members,
NYFOA's voice will become
stronger!

Welcome New Members

We welcome the following new members (who joined since the publishing of the last issue) to NYFOA and thank them for their interest in, and support of, the organization:

Name	Chapter
Scott Brady	SOT
Richard Conklin	SOT
Cole Green	AFC
David Kerr	LHC
Will Kim	WFL
Scott Kochlefl	LHC
John Koster	WFL
Eric Kurta & Cheryl Stinerock	WFL
Leonard Letendre	AFC
Kevin Mathers	SOT
Paul Niederauer	LHC
Marjorie Page	AFC
Rebecca & Peter Parshall	WFL
Joshua M. Serbonich	SOT
Rosalba Torre	SAC
Mark von Dwingelo	CDC
Winnakee Land Trust	LHC
Marcia & Louis Zollinger	AFC

Resisting Rot

JEFF JOSEPH

An old cliché we have all heard is that nothing is certain but death and taxes. True enough as far as it goes, but I am going to add a third certainty—that after things die, they rot. This is a good and necessary thing in the big picture, as the cycles of death and decay are essential in creating the conditions that foster future life. Today’s rot creates tomorrow’s fertility. In our everyday lives, however, rot is a relentless menace, consuming all kinds of things that we would much rather not relinquish so easily. Especially things made out of wood.

For a broad range of insects, bacteria, and fungi, wood is food. In order for this food to be palatable, three conditions are generally required: adequate temperature (generally between a bare minimum of 35 and a maximum of 100 degrees F, with temperatures higher in the range encouraging faster consumption), adequate moisture (a middle range between the extremes of fully saturated when freshly cut, and kiln-dried), and adequate available oxygen for respiration while the decay organisms eat. Once these basic requirements are met, the unique chemical and structural characteristics of each species of timber will determine just how desirable a given piece of wood will be for decay organisms.

So what are some strategies for building with wood that will encourage longevity? One common option is the use of pressure treated lumber (PT), which in our area is generally plantation grown southern pine of a few different species. It is readily available, and is reasonably priced. It is infused with a formulation of copper that deters decay organisms—a much less toxic method than the arsenic and chromium that were previously used to treat lumber until outlawed for residential use in 2003. PT is commonly used for buried posts, mudsills, fences, retaining walls, decks, and other outdoor structures where the lumber will be in direct contact with the soil or water. Some downsides are its residual toxicity (both for humans and the environment), a limited range of standard sizes to choose



from, its generally low quality due to knots and other defects, its very high initial weight when freshly infused, as well as its propensity to warp, cup, twist, check, and shrink substantially when drying. So while pressure treated wood does a lot of jobs adequately, it really doesn’t do any of them with a whole lot of style or refinement. This is where local wood comes in.

Being surrounded by diverse forests gives us a great many options when it comes to selecting wood for any given project. Without chemical treatment, we have to rely on some basic knowledge of the natural properties of the different species at our disposal, as well as some common sense, in order to build lasting structures.

With respect to decay, the USDA Forest Products Laboratory classifies our common timber species in four categories, ranging from ‘very resistant’ down to ‘nonresistant’ (see Resources). The most resistant species we have here in NY that grows to timber size is black locust (*Robinia pseudoacacia*), but it is under ever-increasing demand so can be hard to source in quantity, and can command very high prices. It has often

been mischaracterized as a ‘weed’ and/or as an invasive species, but if you have access to a grove of mature locust consider yourself very fortunate, as its ability to sprout from both stump and roots makes it a truly renewable resource. After locust, there are dozens of other species in our region with varying degrees of resistance, most of which are suitable for outdoor projects when used strategically.

The image above is of a simple structure I built in my woodlot using four species of locally sourced lumber. From the ground up, it starts with stone piers, which helped to create a solid, level base. They also hold the entire structure away from any direct contact with the soil, which is the quickest route for decay organisms to get a foothold in wood.

The sills and joists that sit directly on the stones and support the frame are white oak (*Quercus alba*), which has high rot resistance, great strength, and is very reasonably priced in my area (black locust would have been another good choice here, but would have been over five *times* the price).

continued on page 16

Ask A Professional

PETER SMALLIDGE



Peter Smallidge

Landowner questions are addressed by foresters and other natural resources professionals. Landowners should be careful when interpreting answers and applying this general advice to their property because landowner objectives and property conditions will influence specific management options. When in doubt, check with your regional DEC office or other service providers. Landowners are also encouraged to be active participants in Cornell Cooperative Extension and NYFOA programs to gain additional, often site-specific, answers to questions. To submit a question, email to Peter Smallidge at pjs23@cornell.edu with an explicit mention of "Ask a Professional." Additional reading on various topics is available at www.forestconnect.info

Emerald ash borer has been known in New York since 2009. It is throughout most areas of western and southern NY, and expanding along the eastern and western borders of the Adirondacks. A map of EAB in NY is available here https://www.dec.ny.gov/docs/lands_forests_pdf/eabdistribution2019.pdf. Early symptoms of EAB include marginal leaf feeding (Figure 1) by the metallic green adults. The adults lay eggs in small holes they create in the surface of the bark, and the eggs hatch into larvae that feed in phloem beneath the bark and the outer layers of wood. The larval galleries girdle the tree. Once larvae have infested the tree, woodpeckers arrive, in search of the larvae. The action of

After Emerald Ash Borer: Considering What to Do When Canopy Trees Die in Your Woodlot

Question:

Emerald ash borer has recently arrived and already there are dead trees. More seem likely to die soon. What should I do? (Danielle E., Southern Finger Lakes chapter)

Answer:

The emerald ash borer (EAB, *Agrilus planipennis*) will have significant impacts on eastern hardwood forests. In many areas the impact has happened. Unfortunately, all of the mature ash are likely to die once EAB arrives in a woodlot. Current research and corresponding field trials are evaluating the efficacy of parasitoid wasps and other biocontrol agents, but their greatest impact is likely to offer hope for ash seedlings and saplings. More information about the EAB biocontrol program is available at <http://www.emeraldashborer.info/biocontrol.php>.

The current characteristics of woodlots will dictate the owner's options and what the woods will look like in the aftermath of EAB-induced mortality. The future characteristics depend upon each woodlot's trajectory; management can influence though not fully direct the trajectory and thus the outcome.



Figure 1. Prior to branch mortality, evidence for EAB in rural woodlands is limited. The classic "D-shaped" exit holes are difficult to find. Often, ash leaves on the ground will show adult feeding on the margin of the leaf. This is a symptom not a sign. Early feeding seems to occur between the veins, but subsequent feeding is across veins, though not across the mid-rib.



Figure 2. Blanding over the entire stem of ash trees is usually indicative of EAB larvae sought by woodpeckers. A vertical linear pattern of blanding may indicate a different native species of ash borer.

the woodpeckers isn't sufficient to control EAB but results in a diagnostic symptom called "blanding" (Figure 2) as a result of pecking on the bark. Once blanding starts, the abundance of larvae is sufficient that tree death is imminent usually within a year or two. An abundance of information about this pest is available at www.emeraldashborer.info and in past issues of the New York Forest Owner magazine (www.nyfoa.org).

Emerald ash borer is one of the latest introduced species-specific pests. The

20th century included the near complete loss of American chestnut from chestnut blight, significant reduction of American elm from Dutch elm disease and elm yellows, drastically altered growth and ecology of American beech from beech bark disease, and extensive mortality to oak from gypsy moth. The current century includes concerns for potentially similar impacts to eastern hemlock from the hemlock woolly adelgid, the red oak subgenus from oak wilt, and sugar maple from Asian long-horned beetle. The most recent pest is

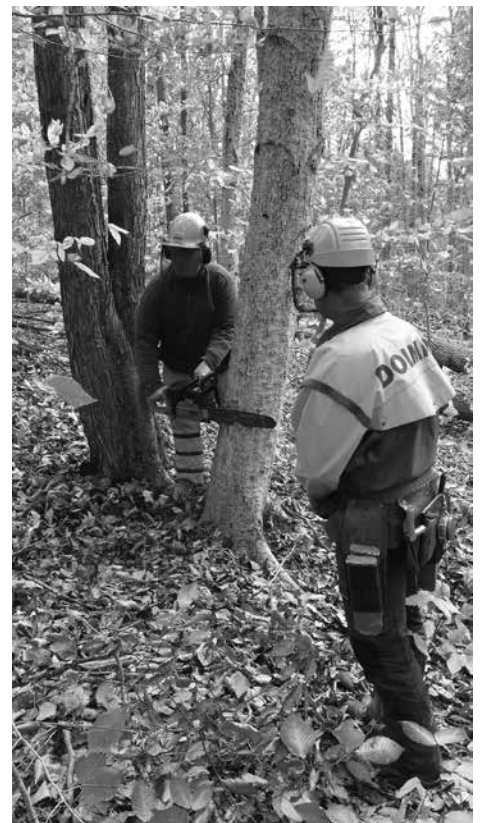


Figure 3. Appropriate safety precautions for working in the woods with a chainsaw include safety helmet, hearing and eye protection, cut resistant chaps or pants, and hands-on training from a certified instructor.

the spotted lantern fly, and that has a broad spectrum of hosts. Fortunately research efforts are active for all these pests.

The forest pests of the past can provide guidance for how woodlot management efforts might influence the outcome of EAB. As with all decisions, management efforts should be guided by owner objectives. The factors that will most likely influence management action in the woodlot before and after EAB include the following, which are discussed below:

1. Safety
2. Landowner objectives
3. Ash markets and timeliness of response
4. Abundance of ash in the overstory
5. Stand size class and ash DBH
6. Deer impact and understory condition
7. Landowner investment

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Wild Things in Your Woodlands

KRISTI SULLIVAN

BEAVER (*Castor canadensis*)



Alfred Viola, Northeastern University, Bugwood.org

The beaver, appropriately designated New York's state mammal, has played an important role in shaping the state's natural environment as well as its history. In the 1600s, Europeans exploring this region found the beaver plentiful. Most bodies of water, large or small, supported populations of beavers. Beaver trapping proved to be a good way of making a living, with exports of beaver pelts from New York to Europe reaching nearly 80,000 annually in the late 1600s. By the late 1800s, however, the beaver was nearly extirpated from the state due to overexploitation and deforestation. A decline in demand for beaver pelts, combined with protective legislation, reintroduction efforts, and recovery of suitable habitat, led to a rebound of beaver populations in the 1900s. Today, beavers are abundant throughout the state, recently returning

even to the waters of New York City and Long Island after 200 years of absence.

Beavers require a constant, plentiful source of water, where they typically build a dam to flood the area and construct a lodge as a home site. They commonly occur along stretches of streams and rivers narrow enough to be dammed, with moderate to little gradient and ample food adjacent to the waterway. However, some live along large rivers, forest-lined lakes, or wooded marshlands. Beavers are unique among mammals in their ability to change their own environment to suit them. Ponds constructed by beavers create habitat for other animals as well, including other furbearers, waterfowl, amphibians, reptiles, fish, invertebrates, and other animals who visit these habitats to feed. By damming streams, beavers create

Beavers are the largest rodent in North America. Adults range from 35 to 46 inches including the tail, and weigh from 45 to 60 pounds. They have heavily muscled, strong-boned bodies, with dorsally flattened tails that serves as a paddle for swimming. Their thick, insulating fur is chestnut to dark brown in color. Beavers are monogamous and typically have one litter of two to four young each year. Kits remain with their parents and younger siblings for two years before setting off on their own. In the wild, beavers typically live from 10 to 12 years, a long life span for a rodent.

ponds that offer protection from predators, and aid in establishing suitable food resources like sedges, grasses, and wetland shrubs.

Beavers are herbivores and locate food using their sharp sense of smell. They feed mostly on herbaceous vegetation during the summer and on the bark, twigs, and buds of aspen, maple, willow, birch, alder, and black cherry during the fall and winter. In preparation for winter, they harvest twigs and branches and pile them in the water, weighting them down with mud. This food pile provides a source of food that they can access below the ice if the pond freezes over. Beavers are active all year and may emerge from the den during the winter to feed on fresh material as well.


Beavers have many interesting physical features that make them well suited to their semi-aquatic, tree-felling

lifestyle. For example, they have long, chisel-like incisors that grow continuously. Gnawing on wood is a necessary activity for offsetting this growth. There have been reports of one adult cutting up to 300 trees in one year. Beavers do not cooperate in cutting trees. Furthermore, a beaver cannot control the direction in which a tree falls.

In addition to their large teeth, beavers have a large, paddle-shaped tail with a leathery covering. The tail serves as a rudder and propeller while swimming and as a support when the animal sits upright. An alarmed beaver also uses its tail to warn others of danger by slapping it against the water's surface.

The beaver has several adaptations for underwater activities. Its lips can be closed behind the incisors and, by pressing the tongue tightly against the roof of its mouth, the beaver can gnaw underwater without choking. Special valves also close off the nostrils. Transparent eyelids called nictitating membranes allow the animal clear vision underwater while protecting its eyes from debris. It also is able to remain submerged for 15 minutes because its heart rate slows.

Beavers are interesting animals that create habitat for other wildlife, and are fascinating to observe. They are active in the evening and at night. A good way to observe beavers is to visit an active beaver dam about an hour before sunset. Initially, the male beaver emerges from the lodge to patrol the area for danger. Later, the female and young will join him. Beavers have very poor eyesight and a quiet observer can sit back and watch the animals go about their daily tasks.

Although the dam-building behavior of beavers is captivating, at times their activities can cause unwanted flooding or damage to valued trees. For more information on dealing with damage done by beavers, visit the Internet Center for Wildlife Damage Management at <http://icwdm.org/wildlife/Beavers.aspx> 

Kristi Sullivan works in the Department of Natural Resources at Cornell. She is Director of the NY Master Naturalist Volunteer Program, and co-directs the Conservation Education and Research Program.




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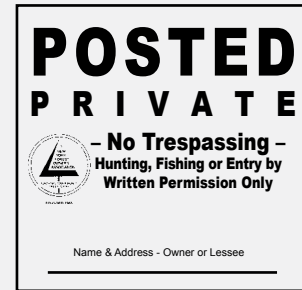


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News from New York Tree Farm Program

DANIEL NEWMAN



The Four Seasons of Tree Farm

With the four seasons of spring, summer, fall, and winter, coincidentally are the four cornerstones of the American Tree Farm System — Wood, Water, Wildlife, and Recreation. As each season arrives, I think of the goals I have set for my Tree Farm and how I will accomplish them.

When I think of water, I think of spring — new growth and the important role that water plays in the establishment of new seedlings in my woods. Considering water in my Tree Farm also makes me think of the impacts that water can have on soil erosion. With the changing climate in our area comes severe weather events, bringing large volumes of water in a

short period of time. Now more than ever, it's important that roads in my woods are in good shape and are able to handle runoff from sudden storms.

When I think of recreation, I think of summer — enjoying hikes with family and friends on my property and gathering firewood for the winter ahead. A well-planned system of Tree Farm access roads and trails provide an easy way to get around in the woods all summer long and the rest of the year, too.

When I think of wildlife, I think of fall and archery season. I've got the game cameras in my Tree Farm set up already; and I know that there's at least one whitetail buck out there for me to try and chase down! Sustainable forest management can provide important habitat for a wide variety of game and non-game wildlife species. While my Tree Farm objectives for wildlife favor

maintaining a vigorous deer population, many of the same management practices are also creating or improving habitat for some forest songbirds.

When I think of wood, I think of winter. Winter is the best time of year to be undertaking harvest activities in the woods — be they commercial timber harvests or cutting trees for timber stand improvement. Operating logging equipment on frozen ground minimizes soil damage and it's easier to get around without a lot of undergrowth in your way. Winter is also my time to reflect on my management accomplishments over the past year, to measure the ways in which I've made a difference in the health and diversity of my forest, and to begin planning for the forest management projects I want to do in the year ahead.

As a consulting forester, I'm considering management options that



New seedlings in the spring.



Summer is a great time for gathering firewood.



Fall is the time for improving habitat for some of the forest songbirds.



Winter is one of the best times for timber harvests.

will make a difference not only for my own Tree Farm, but also for the other family forests whose care I have been entrusted with. Each year, I take part in continuing education programs for foresters to learn about recent forest management research findings, and new ways of doing things in the woods. I urge all forest owners to do the same as opportunities arise.

Being part of the American Tree Farm System is an excellent way for woodland owners to stay current on sustainable forest management ideas, to meet other forest owners and professionals, and to share ideas. Not only can you improve your own woods, but by joining with other Tree Farmers, you will be making a difference at a statewide, and even national, scale. 🌲

Daniel Newman is vice chair of the NYS Tree Farm Committee and owner of Newman Forest & Wildlife Management LLC. He is a member of NY Institute of Consulting Foresters and the national Association of Consulting Foresters.

Would you like to receive an electronic version of future editions of *The Forest Owner*? If so, please send Liana an email (lgooding@nyfoa.org).

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Wormwood

PAUL HETZLER

If you're tired of hearing about new invasive forest pests, I'm right there with you. Seems like they arrive at an ever-increasing pace, and the harm potential ratchets up with each newcomer. At this rate maybe we'll get some wood-boring beetle whose larvae explode. That would put things in perspective. As distasteful as it may be to learn who's next in the queue, we all realize it's better to know what we're up against.

If there's a bright side to spotted lanternfly, it's that it has an actual bright side — it stands out. At the other end of the obvious spectrum is a new and significant threat to forests, Asian earthworms, which have cleverly disguised themselves as earthworms. The fact that we are used to seeing worms in the landscape makes them a challenge to notice, but it is well worth the effort.

The new pests are three related species of earthworms from East Asia, *Amyntas agrestis*, *A. tokioensis*, and *Metaphire hilgendorfi*, all of which are established in New York State. While *A. agrestis* was the first to be identified, it has come to light

that *A. tokioensis* is the more common. Known variously as Asian jumping worms, Alabama jumpers, snake worms, crazy worms, and probably some choice expletives, these super-sized (8" or 20 cm when mature) annelid cousins look very similar. In fact they can only be accurately separated by species through dissection, so I think it's fair to consider them as a group.

Asian worms can be identified by the smooth band called a clitellum, which in European earthworms is dark, close to their middle, and thicker than the rest of the body. In these worms it is milky-gray to white, and much closer to the head. It is generally flush with the body as well. Behavior is another clue: when disturbed they scatter across the ground, snake-like, rather than disappear into the soil. If touched, they thrash wildly and may shed their tail. They feel drier than other worms, and more turgid. A woman who tried to fish with them told me they "exploded" when she put a hook in them. Incidentally she said fish will not touch Asian worms, which speaks to their toxicity.

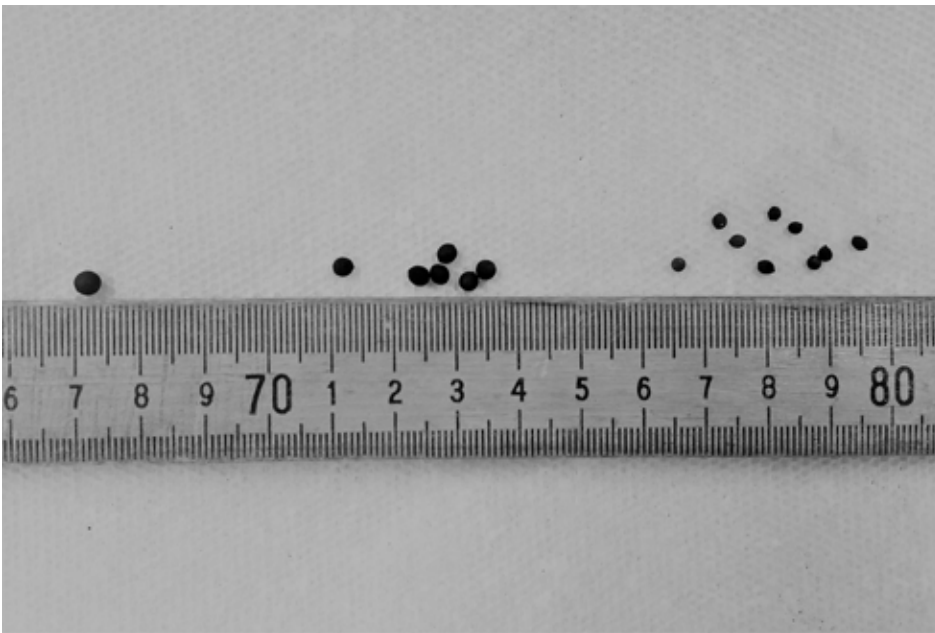
One issue with Asian worms in the forest is that they have a high reproductive potential, with 2 or sometimes 3 generations per season compared to one for European worms. The latter are hermaphroditic, having both male and female organs, but still needing to find a mate. Invasive Asian worms are parthenogenic, all females can bypass the need to find a date, and spew out cocoons teeming with baby female worms. All it takes is one to start an infestation.

As with any recent pest, Asian worms have not been well-studied. Even the modest research which has been done can conflict at times. It is known that adult Asian worms die off in winter, but that their cocoons are cold-hardy. I have read figures which place the hardiness cutoff around -30F, and other references to the limit being -40 degrees or colder. The point is, no part of New York State is too cold for these things. And based on research done by Josef Görres at the University of Vermont, cocoons can remain viable in the soil for at least 3 years, analogous to a soil seed bank.

By the end of summer, Asian worm biomass is many times that of other species.



Adult Asian jumping worm. Photo Credit: nrdc.org



Asian jumping worm cocoons. Photo Credit: Wisconsin University Arboretum

This means they eat a lot, primarily on the surface and within the top one inch or 2.4 cm of soil. A September 2016 article in *Science Daily* cites work done by Jiangxiao Qiu, now a postdoctoral researcher with The Nature Conservancy. His graduate research at the University of Wisconsin-Madison found that Asian worms reduced leaf litter in hardwood forests by 95%. I have seen an infested forest in Cortland County NY, and can attest that it was almost entirely bare soil.

Not only do Asian worms leave soil bare, they leave it barren. Breaking down detritus incredibly fast leads to a big increase in plant-available nitrogen late in the season, when few plants can use it. Nearly all these nitrates leach out of the soil by spring. The soil also loses its healthy structure, becoming granular, somewhat like coffee grounds, much more vulnerable to erosion and compaction.

In addition to their insatiable appetites for organic matter, Asian worms are known to vastly increase lignin-busting enzymes, according to a March 2015 article in *Applied Soil Ecology*. At this time it is unclear whether the worms secrete the enzyme itself, or a substance which induces white-rot fungi to ramp up production of the compound. As a result of this effect, wood breaks down at least 2.5 times faster in the presence of Asian worms. It is also not known what effect this has on tree seeds.

In the face of an Asian worm infestation, other changes in hardwood forest

ecosystems occur. European earthworms disappear, although no one yet knows the mechanism by which this happens. Bruce Allen Snyder of the University of Georgia documented a “significant decrease in millipede abundance and species richness” in the Great Smoky Mountains. Salamander populations fall as well, with researchers finding fewer juvenile and male salamanders at infested sites.

These invaders have few predators. Raccoons, opossums, moles, and centipedes find them tasty. Many amphibians feel otherwise. Wisconsin Department of Natural Resources Invasive Species Specialist Bernadette Williams, who essentially broke

the whole Asian worm story, told me in a 2014 phone interview she observed a salamander grab an Asian worm, then release it and spend the next 10 minutes wiping its mouth on the soil.

I doubt anyone needs convincing that Asian worms should be taken seriously. Bernadette Williams put it bluntly: “Their [Asian worm] introduction into our state poses a huge threat to the future of our forests.”

So where to from here? Asian worms are commonly spread through the horticulture trade, both in containerized plants, and especially mulch, which they love. Paw through bulk mulch before purchasing, and maybe think twice about getting fill delivered to your property. And with tree seedlings, it is safer to plant bare-root stock than plugs.

Equipment may pose the biggest threat to forest land, so be cautious. Find out where their last job was before a logging crew shows up at your place. If you go on a woods walk in another woodlot, turn over a log or flat rock. Do the worms dive down, or scoot out? Always clean off your boots before getting in the vehicle to return. Worm cocoons are tan to brown spheres about 2 mm. in diameter, and very easy to take home with you. A little prevention goes a long way. 🌱

Paul Hetzler is the Horticulture and Natural Resources Educator, Cornell Cooperative Extension of St. Lawrence County. He has been an ISA Certified Arborist since 1996, and is a member of the Society of American Foresters, NYS Arborists, ISA-Ontario, Canadian Society of Environmental Biologists, and the Canadian Institute of Forestry.

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Woodland Health

A column focusing on topics that might limit the health, vigor and productivity of our private or public woodlands

COORDINATED BY MARK WHITMORE

AN UPDATE ON EMERALD ASH BORER

BY TIM MORRIS

Many residents of New York, whether they are completely aware of it or not, have likely seen the destruction caused by emerald ash borer (EAB) as they drive along our interstates across New York State. This invasive beetle was first discovered in southwestern New York in 2007, followed shortly thereafter by discoveries near Buffalo, Bath, and in the Hudson River Valley. It and

has since spread to at least 45 of New York's 62 counties. Immature larvae of this green beetle feed just under the bark of ash trees, which interferes with the trees transportation of nutrients and causes a visible health decline starting in the tree canopy. EAB has caused a relatively rapid wave of ash mortality across New York and the eastern and mid-western United States; with tree death generally occurring two to four

years after the first signs of infestation.

Historically, management efforts attempted to slow ash mortality, but in the last few years, new options have been researched as a means to control EAB. Biocontrol is the practice of identifying specialist predators from a pest's native range, and establishing them in the invaded region. Once emerald ash borer was identified as the mortality agent of North American ash, researchers located its native range in Eastern Asia. In this region, EAB is only a minor pest, found at low densities and generally only killing weakened ash trees. Researchers tasked with identifying mortality agents keeping the beetle in check in its native range identified several highly specialized insects acting as parasitoids. These parasitoids are small wasps with a modified ovipositor used as a specialized tool for egg laying — it is what allows parasitoids to drill into trees and lay eggs in EAB larvae. While a parasite obtains energy from its host, it usually does not kill the host, while a parasitoid always kills the host.

Identifying these species was only the first step towards potential control of EAB in North America; as in order to be considered as a potential biocontrol agent, a parasitoid must be highly specialized to attack only EAB and not closely related beetles. To ensure this, potential biocontrol agents must pass a series of tests to determine whether or not they can utilize insects similar to their natural hosts prior to ever being released outside of their native range. In addition to them being very specific and attacking only the pest of interest, the parasitoid must also be able to live in the introduced range; that is, a climatic match is required if the species is to establish and provide long-term benefits.

So far, several species have passed these tests and have been released in the United States, although research is still ongoing to identify other potential biocontrol agents. Parasitoid releases have been released in research sites across New York since 2011 and

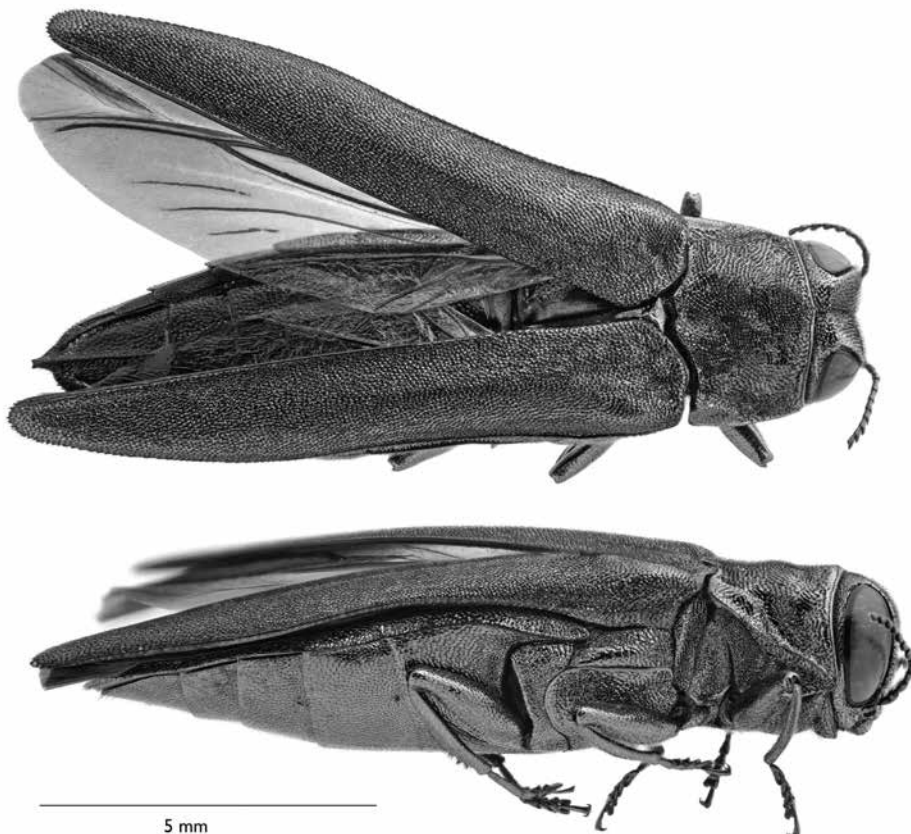


Figure 1. Adult emerald ash borer are metallic green and are about half an inch long. Photo credit: Kent Loeffler

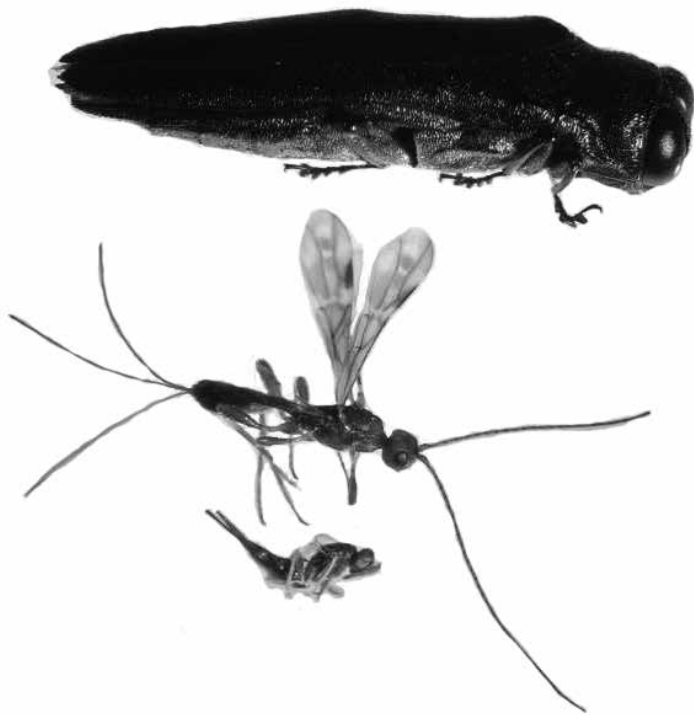


Figure 2. Adult emerald ash borer (Top), alongside two larval parasitoids *Spathius galinae* (Middle), and *Tetrastichus planipennis* (Bottom), which have been released in New York. *Oobius agrili*, the egg parasitoid, is not pictured, but is about 1/16th of the size of EAB.

forest stands are being monitored to assess their impacts. Release sites have included both private and public lands, as land managers collaborate with researchers to enable this work. To date, almost half of New York's counties contain at least one research site and efforts are currently underway, led by USDA APHIS-PPQ, to release in more sites.

Research at these sites is currently focused on three species of parasitoids, *Oobius agrili*, *Spathius galinae*, and *Tetrastichus planipennis*. As mentioned previously, these parasitoids are highly specialized to attack EAB at different life stages in different ways, i.e. when EAB are eggs or larvae and when EAB are in large or small trees, and it is for this reason that releasing multiple species provides the best chance of comprehensive control.

Oobius agrili is an egg parasitoid, meaning it deposits its own eggs into the eggs of EAB. Since EAB lays its eggs in the bark crevices of ash trees,


O. agrili does not require any means of penetrating the bark of the tree. Egg parasitoids are an ideal control agent, as once an EAB progresses from an egg to a larval form, it's feeding will inflict damage to the host tree, therefore, parasitism prior to this damage protects our trees from any harm.

In addition to *O. agrili*, *S. galinae* and *T. planipennis* have also been released. These parasitoids are adapted to target EAB larvae feeding inside of ash trees. They do this by using their antennae to track vibrations caused by EAB larvae feeding through the bark of the tree. Once a larva has been located, the parasitoid's specialized ovipositor allows it to drill through the bark, stab, and paralyze the larva, and then deposit its eggs. Once parasitoid eggs hatch, the wasp larvae consume the EAB larva from the inside out and progress into their own life cycle. A key difference between *S. galinae* and *T. planipennis* is that *S. galinae*'s

ovipositor is longer than that of *T. planipennis*, meaning the former can target EAB in larger trees through their thicker bark.

These species provide hope for North American ash and scientists are examining exactly what the future of ash may be. Ongoing research in aftermath forests, those which have experienced mass ash mortality, will tell us if these forests may be able to reestablish with the assistance of these small wasps. With only a few remaining adult ash in these forest stands, the population of EAB will naturally decline until host material once again becomes available. This will occur when understory ash, currently too small to be suitable for EAB, grow into more suitable size classes. When this happens, a combined suite of *O. agrili*, *T. planipennis*, and *S. galinae* may be able to protect the small trees as their population numbers synchronize with those of EAB.

While the future of ash still remains uncertain in our forests, biocontrol provides hope for its regeneration and restoration. Ongoing research will continue to follow introduced parasitoid populations and the health of ash trees. Preliminary results have been promising with parasitoid populations successfully establishing across the state. Results regarding their impacts on ash borer populations, and their potential role protecting our ash trees, should become clearer in the near future.

Additional information is available through the USDA APHIS website, found at <https://www.aphis.usda.gov/aphis/ourfocus/planthealth/plant-pest-and-disease-programs/pests-and-diseases/emerald-ash-borer>. 

Tim Morris is a Master's student in Conservation Biology at SUNY - College of Environmental Science and Forestry, where he is currently researching EAB biocontrol.

Mark Whitmore is a forest entomologist in the Cornell University Department of Natural Resources and the chair of the NY Forest Health Advisory Council.

Resisting Rot (continued)

The decking, which is well out of the way of direct contact with the soil, but which will go through repeated cycles of wetting and drying as rain and snow sit on its flat surfaces, is American larch (*Larix laricina*). It is lightweight, inexpensive, can be planed to a very smooth surface (no splinters), and is considered moderately resistant.

The posts, beams, studs, rafters, purlins, rake and eave trim boards, as well as the board and batten siding, are all eastern hemlock (*Tsuga canadensis*), another structurally strong, readily available, and very inexpensive wood that is moderately resistant to decay, which is adequate in this case as all of its surfaces that will get wet over time are vertical and will thus shed water quickly. The structure was also built with very wide roof overhangs in order to keep rain away from all four sides as much as possible. Last, the recycled window sash was most likely made of Eastern white pine (*Pinus strobus*), which is only marginally resistant, but it is painted, which protects it from moisture infiltration, and is also recessed within the window frame to reduce its exposure to wind driven rain.

While this structure could have been built with pressure treated, composite, or even some of the plastic 'lumber' that is available today, and might have lasted somewhat longer for it, for me it would not have remotely the same aesthetic impact, or the sense of satisfaction that comes from creating something that seems to (and actually does) 'grow' directly from its environment. In addition, when sourcing the lumber I supported two local mills, so in effect 'voted' for the preservation of a viable forest economy in our region.

If I live to a ripe old age, I may end up having to replace the hemlock siding or the larch decking, but for me that will be a small price to pay for the satisfaction it will bring me in the meantime. And when its time has finally come, the wooden elements of this humble structure will all vanish into the soil, leaving no trace, as rot always wins out in the end. ♻️

Resources:

Wood Handbook: Wood as an Engineering Material, USDA Forest Service, Forest Products Laboratory, General Technical Report, FPL-GTR-190, 2010.

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Figure 4. Statewide, ash represents about 7% of the forest. In some woodlots, ash will occur as scattered stems. The mortality is unfortunate, but of lesser impact than in other woods with abundant ash.

Safety

Safety considerations before EAB-induced mortality occurs include standard protocols for working in the woods, such as appropriate training and the use of personal protective equipment (Figure 3). With the onset of tree mortality, access to the woods is increasingly risky. With high levels of tree mortality, work should be restricted to trained professionals with appropriate equipment. With high levels of mortality, many management actions are precluded. Owners should work with their forester to develop a plan that can be implemented before tree mortality happens.

Landowner Objectives

All decisions of woodlot management should be based upon and consistent with ownership objectives. Some of the management options described



Figure 5. This picture of a roadside hedgerow of ash illustrates the impact of a high abundance of ash. A woodlot with similar ash density would be heavily impacted. Note the understory here is mostly invasive shrubs that will benefit from increased sunlight.

here depend upon owner objectives. For example, an ownership objective for timber revenue might be realized sooner than initially planned if there are significant numbers of sawlog sized ash. (Note – talk to your forester about the silvicultural implications of an ash salvage harvest, which is not discussed here) Or, if the trees are smaller, there may be no significant revenue potential. An ownership objective for a tall closed-canopy forest, given abundant dead ash, might be at least temporarily stalled or beset with a prolonged and expensive delay. Access for firewood, recreation, maple syrup, etc. will be complicated by the presence of dead standing ash trees.

Ash Markets and Timeliness of Response

In the time since EAB has been known in NY, the market for ash sawlogs has remained fairly strong. What might have been a surplus of logs and reduced pricing has not happened. The future market is unknown. The potential for accessing these markets depends on having a harvest prior to mortality. The option for logging is usually lost when

canopy trees start dying due to logger safety and the tendency for dead ash to fracture on impact. Markets are not available for all sizes of ash, but the presence of seedlings, saplings, and small poles provide a genetic reservoir of ash.

Abundance of Ash In the Overstory

The abundance of ash is the most significant determinant in the impact that EAB will have in a woodlot. In woods with relatively few or isolated ash, their mortality will have minimal impact on the functioning of the ecosystem (Figure 4). In contrast, some woodlots have significant amounts of ash, and their mortality will fundamentally change the look and function of that ecosystem (Figure 5). Ash is rated as mid-tolerant of shade and can occur in lower canopy position. However, ash usually occupies mid- to upper-canopy positions. Ash mortality within these upper positions will allow for increased sunlight to the subcanopy and forest floor, and increased growth from understory plants. Owners can assess the abundance of ash in upper and lower crown positions to forecast

how light levels will change and the species that will benefit from increased light.

Stand Size Class and Ash DBH

Stands of commercial size class may have the potential to generate revenue. If owner objectives align with the process of a timber harvest, planning should begin before there is evidence of EAB. There is no obligation to harvest the ash, but as trees die they create hazards for work or recreation in the woods. Pole sized trees (5" to 11" diameter breast height, dbh) may have utility as firewood. Commercial logging crews seldom harvest just pole-sized firewood because the profit margin is small. Unless previously recommended in your management plan, avoid the temptation to add additional non-ash stems to a timber sale to "sweeten the pot." Also, be cautious about friends, relatives, and neighbors who offer to help by cutting and removing ash firewood; they may lack the necessary skill and equipment

to work safely and effectively, or to limit damage to desirable residual trees.

Deer Impact and Understory Condition

In many areas, selective deer browsing has reduced the abundance of desirable species (e.g., maple, basswood, oak, cherry, etc.) and favored the growth of typically undesirable species (e.g., beech, hophornbeam, invasive shrubs, etc.). Deer impact is the combined effect of deer abundance and forage abundance; if deer abundance exceeds forage abundance then desirable species in the woodland understory suffer. Without action that controls deer impacts and the proliferation of undesirable species, woodlots with an abundance of ash and undesirable species will likely shift to a woodland that is low-diversity, low-canopy, and reduced productivity (Figure 6). Recreational hunting alone is seldom sufficient to limit deer impacts.

Consider options such as fences, cages, slash walls or other effective barriers, plus adequate light, to protect desirable seedlings.

Landowner Investment

Most management actions require some investment of time or money by the owner. In other cases, the owner may work with a forester to arrange a harvest to accomplish the majority of the work. Some owners will benefit by a harvest with low revenue that accomplishes their objectives without work on their part. An updated management plan can help owners plan the sequence of operations that optimize their resources and minimize investments. Some cost-share funds may be available, but these are insufficient to provide for all of the work of owners impacted by EAB. Check with your forester to see what cost-share funding might be available in your area, what process is required, and then act as quickly as possible.


Some of the strategies to influence the trajectory of your woods will involve cutting trees. Owners without experience in the harvesting process will benefit by being able to visualize what different types of harvests look like. One option is to attend a NYFOA woodwalk to see a harvest on another owner's property. There is also a new resource by the Maine Forest Service that illustrates before and after a harvest. The images are of Maine woodlands, but illustrate conditions similarly found in NY and the Northeast. Search the Internet for "what will my woods look like" or visit https://www.maine.gov/dacf/mfs/projects/what_will_my_woods_look_like/index.html 



Figure 6. This woodlot has a relatively low ash density, but the crowns are in the upper canopy. The mortality will allow more sunlight to the invasive shrubs. The adjacent trees are desirable species, which will benefit also from more light. Without intervention, this woodlot will shift over time to a character that is less desired by many woodland owners.

The column is coordinated by Peter Smallidge, NYS Extension Forester and Director, Arnot Teaching and Research Forest, Department of Natural Resources, Cornell University Cooperative Extension, Ithaca, NY 14853. Contact Peter at pjs23@cornell.edu, or (607) 592 – 3640. Visit his website www.ForestConnect.info, and webinar archives at www.youtube.com/ForestConnect

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Scott and Donna Bonno

DORIAN HYLAND

Early in life Scott Bonno fell in love with the woods down the hill. As a child, he cut wood and hauled water with his father and younger brother for a neighbor who had been injured and could no longer work. By the time he was a teen, he dreamed of buying the land in Pierrepont Township in the St. Lawrence County foothills of the Adirondacks. After the Civil War, the property was the first homestead of Marcus Crossman, who carved a farm out of the forest and used the timber for building the home and barns. His son, Ora, started a sugarbush that produced sap for decades. Ora's son, Howard, worked the land until 1961 when injuries prevented him from running the farm.

After graduating from the local community college, Scott gained employment at the county sheriff's office. In 1985, he was able to purchase the Crossman farm consisting of 208 acres. Shortly after he purchased the land, Scott began to run cattle on the farm, and cut 100 cords of wood a year. Over the

years, he and his wife, Donna, added four adjoining parcels for a total of 230 acres, 210 of which are forest. They renamed the farm Glenmeal Maple Lane.

One of their immediate tasks was to save two of the barns, including a 40x60 open loft barn with stables, and install water. Following that, they began the ongoing process of rehabilitating the forest, which had not been managed since Howard's injury, and especially, the precious sugarbush which had been heavily cut for firewood between 1961 and 1978.

From the start, Scott enlisted the aid of NYSDEC foresters. Forester Charles Porter helped create his first stewardship plan, and marked his first timber harvest in 1987. Enlisting aid and advice in the best silviculture practices has always been integral to his goals. Porter aided them in their first Timber Stand Improvement (TSI) in 1992. A major result of his continuing efforts is the regeneration of the original sugarbush and other young timber stands.



This northern red oak sawtimber quality tree produces nuts (acorns) for wildlife, and that will regenerate into future nice trees. Eventually the tree will produce lumber for someone's building project.

Like many young people they substituted labor for the money they didn't have. Their first tractor cost \$200. Eventually they bought an ATV to pull a small wood trailer. Soon their family expanded. A son, Leon was born in 1987 and daughter, Erin, the following year.

Glenmeal Maple Lane farm is a diverse woods with eastern hardwoods dominating the landscape with stands of hemlock, white cedar, spruce, and pine. Since so many of the mature beech were lost, they focused on regenerating red oak and bitternut hickory by collecting, and then hand plunging or broadcasting thousands of nuts after "mast" or bumper crops of nuts fell. Some acorns and hickory nuts have germinated and they use five foot tree tubes to protect them. There are three ponds and a beaver pond on the creek which attracts a wide variety of wildlife. Listening to bull frogs, spring peepers, pileated woodpeckers, coyotes, owls, and turkeys may be normal occurrences, but they are not taken for granted. Scott enjoys these experiences every time he is in the forest. It is why he is there: it still invigorates him. Stopping to appreciate a scenic outlook makes his day. Managing timber makes sense economically, but he still enjoys watching a tree grow

continued on page 22



The "maple monarch" towers over Scott and Donna, with examples of TSI in the background.



Scott and Donna enjoy walking in the woods to see the fruits of their labor and to discuss future opportunities.

into something useful that will be valued by others. He has had good growth rates with red oak. One specimen has grown 13 inches in diameter over the last 20 years. He measures 50 hardwood “stake trees” annually with a diameter tape. It takes a day of walking, but it is a fun and quiet activity. He often tells Donna that “I am going to the woods to thin my carrots.” He has a very large garden.

Scott feels fortunate to have shared these experiences with his family. Life was always busy with both he and Donna working full time. Donna maintains employment and continues to travel regularly for her job; however, Scott retired in 2016. While his early career as a deputy sheriff allowed him the ability to be outside, his career path changed with a promotion to sergeant, and later, in 2008, an appointment to the department’s undersheriff where he took charge of the criminal division. Getting into the woods, cutting trees or chopping wood was a relief from his desk job. With less time for fun, he sold his evaporator. His real interest was thinning hardwood forest stands and selling fuel wood in the community. He continues to cut 100 cords of fuel wood annually, and occasionally, a load of pulp or saw logs. He did this by working before his shift for an hour or two. Every year he harvests sap from the

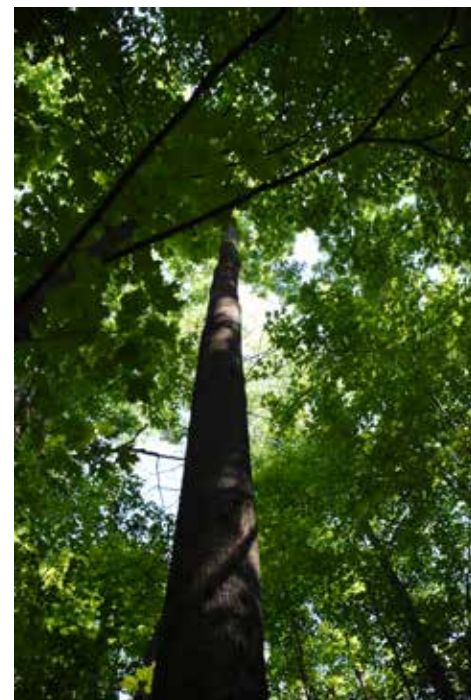
original, previously cut, now reinvigorated sugarbush and sells the sap to a neighbor.

In January 1998 a tremendous ice storm ranged throughout the Northeast into Maine and southern Canada. The family was without power for 17 days. For two weeks he worked twelve hour shifts for the sheriff’s office, chainsaw in hand, so he could clear roads for emergency calls. The first day of the storm he came home and listened as tree limbs snapped in the forest at a rate of 30-40 per minute which sounded like light rifle fire all night long. As temperatures warmed and he could get into the woods, his fears were confirmed. The storm had significantly damaged those stands where they had done so much TSI work. It was emotionally distressing, although he knew he was lucky compared to others who had lost much more than trees. There was no syrup harvest that year. Twenty one years later, the crowns and boles of some trees still show damage. The following summer, an army of forest tent caterpillars infested the woods. Scott guesses it is nature’s way of ensuring new habitat. Since the storm, he has learned to thin the woods less vigorously

There have been stand improvement projects which have been more conservative after the first thinning suffered from the ice storm of ‘98. Although the storm

temporarily slowed tree growth, the area recovered far faster with the opened canopy than without it. In designated areas, he has planted many thousands of acorns, hickory nuts, and some black walnut. Chosen saplings are protected by Tubex tree shelters. Two commercial timber harvests in recent years with occasional pulpwood salvage and the 100 cords of firewood a year are the byproducts of their silvicultural practices. The 65 HP farm tractor with cable winch, bucket, or pallet forks with a hydraulic clam and a wood splitter with a hydraulic lift makes it possible for Scott to do the work of his younger self.

Another change is in how he handles the sugarbush. At first, he and his brother, Leonard, made syrup together and handled 1,200 bucket taps from trees on both of their properties. Eventually the syrup operation re-focused to become a family oriented enterprise, and they would tap 350-400 trees and process the sap on a 2×8 evaporator with a pre-heater and steam hood. Donna prepared a picnic dinner which they ate in the sugar house with family and friends. The kids did homework at the picnic table and might collapse into the bunk beds, sleeping until the boiling was done, usually between 10 pm and 2 am. Today he harvests the syrup but sells it to a neighbor for processing.



A nice bitternut hickory. The mix of oak and hickory on the property help feed the variety of wildlife that Scott and Donna enjoy seeing.



Scott inspects seedlings and tubes to make sure the tubes are secure and the seedlings are healthy.

In spite of difficulties, they've enjoyed many good times as a family. They've kept saddle horses for over 30 years and sometimes, like a picture postcard, they tugged a Christmas tree home, cowboy style, behind the horse. The kids helped plant and prune the Christmas trees, and transplanted white oaks and blueberries. Sugaring-off parties with neighbors and 4-H kids, snowshoeing, cross country skiing, sledding, riding ATV's, and dirt-bikes is a partial list of activities they have enjoyed. While not hunters, Donna, Leon, and

Erin have harvested game because they understand the importance of managing game populations. Donna and Scott are proud their children grew up in the forest and made their own fun, finding special places and things. "Whale Rock" and "Teepee Rock" have a significant meaning to them and the "Devil's Backbone" and the "Waterfall" are special places they will revisit.

Beyond creating a sugarbush and mature forest, Donna and Scott achieved their wider goal of providing habitat for

many species. Several small food plots in the forest are visited not only by deer and turkeys but also by black bear, fox, coyotes, squirrels, grouse, and many other species. He is starting to understand more about songbirds in the forest and the value of a young forest to them. As part of their long term plan, they created the three small ponds, all fed by springs. To provide shelter for wildlife habitat, he thinned a ravine which was a natural wildlife corridor with meadows on either side and created a sanctuary for nesting birds and bedding and fawning for deer as well as other wildlife.

They've used glyphosate judiciously when beech was the target, although it is not a big problem. There are minor problems with honeysuckle and buckthorn. He pulls small stems in the spring when the ground is soft and cuts larger stems. One thing is certain, the quality of his woodlot, on average, has increased greatly since 1985.

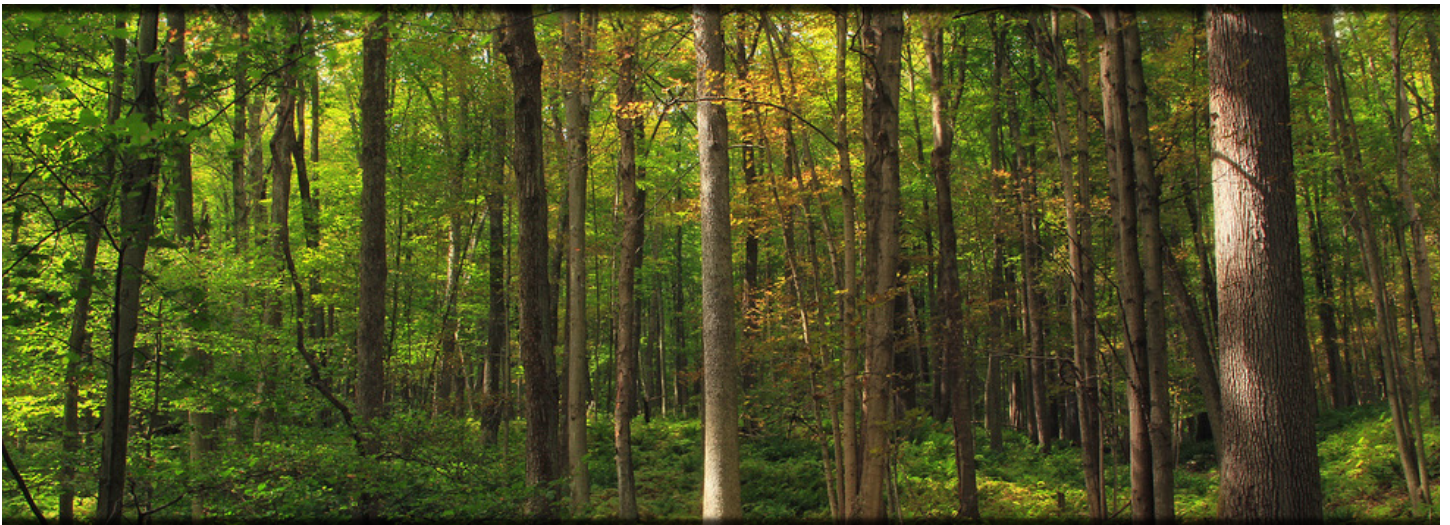
He works alone, all the time. With appropriate caution to potential dangers, he uses safety gear and took the "Game of Logging" course. If he had to wait for a partner, he wouldn't get to the woods as often as he wants. On a positive note, he says, he never worries about where his partner is. He often hopscoches around looking for problem areas, correcting as he goes, preferring to make frequent visits rather than cut too much. "I am sure I tend to micromanage some stands, but I feel that every stand has potential equity and you want to maximize the equity."

He uses Cornell's ForestConnect website as a resource and attends woodwalks whenever possible. In 2016 he attended Cornell's Master Forest Owner Program which was a tremendous resource and he enjoys bringing it into the community. He takes every opportunity to talk to forest owners, loggers, and foresters, and hosted a woodwalk in August 2019. Everyone, he says, has something to offer, some insight into the problems or useful experiences to share. That's the primary reason he belongs to NYFOA; that it is a network of like-minded people. "We are a very diverse group from a career-based standpoint, but we are all passionate about the forest, and I believe we are out there for many of the same reasons." 🌲

Dorian Hyland, is a writer for The New York Forest Owner landowner profile. Photos credits A. J. Sharlow.



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