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WOODLOT TIPS



WINTER 2019

Programs

Saturday March 2 *WRWA Members Only Field Trip* — Somerset Old Growth Forest Tour

Retired Windham County Forester Bill Guenther will lead a tour to a Somerset woodlot in what we believe to be a stand of old growth, which consists mostly of yellow birch. This 60-acre property was a gift to Leland & Gray High School many years ago. About 12–15 acres of this property are stocked with the big birches, the remainder in spruce/fir and beaver flowage.

Two years ago Bill went out before leaf-out and measured what he believed to be the largest yellow birch in the stand. Since the State champion yellow birch died up in Victory few years ago, a new champ was crowned out in Somerset.

We offer this trip only to WRWA members and the group size is limited to 12. ***Bill will need to hear from you by February 26th*** if you are interested in going. We need a minimum of five folks to sign up for the trip, so please contact Bill by phone or email to let him know you want to sign on.

“We will meet in West Brattleboro at 9:30 a.m. to carpool (with a later stop in Wilmington) as parking can be very limited out there in the winter. Once at the Somerset Dam, we’ll travel 1.5 miles up the Old County Road to the western edge of the property, then bushwhack east out to the old growth. **We ask that folks bring either skis or snowshoes: This is a big snow belt and early March could potentially bring snow depths at about chest high.**

At about lunchtime, we'll stop at the woodlot's campsite and have a picnic lunch. It will be a nice warm-up if you also bring a thermos of your favorite hot beverage. After lunch we'll head out into the birch stand and look at these magnificent specimens; many are well over three feet in diameter.

We hope to conclude our day by about 4 p.m. Keep in mind that Somerset is the icebox of Windham County, and even though the trip will take place in March, we could easily have some pretty severe winter conditions, so dress warmly and in layers. We want to assure a safe and enjoyable day for everyone.”

You need to call Bill Guenther at 365-4252 or e-mail him at billg@sover.net to reserve a spot (no later than February 26th), get the specific meeting place, and to make sure you've got the right gear. This trip is moderate to somewhat strenuous, and a long way from anywhere. Bill also needs to ensure that the private road up to the dam has been plowed. Adverse road conditions could cause us to cancel. Spring comes very late out there!

Saturday, March 9th at 10 a.m. — Winter Tree Walk and Potluck Lunch

Bill Guenther, who recently retired as Windham County Forester, will lead a winter tree identification walk in a Halifax woodlot, about a 15-minute drive from West Brattleboro. Bill will show us how to use characteristics such as habitat, growth form, branching pattern, and bark to identify about 20 species of native Vermont trees. This includes a special spot from where we can view four different species of birch tree.

We will walk along gently rolling terrain. Bring your snowshoes, as conditions in Halifax are typically colder and snowier than Brattleboro. The walk will begin at 10 a.m., followed by a potluck lunch. For those who may not be up for snowshoeing, you are welcome to come and sip hot cider and talk about trees while the others are on the walk. Well-mannered dogs on leashes are welcome to participate in this event.

If you plan to join us, please contact Linda Lyon (LindaALyon@gmail.com or 802-368-2211) by March 6th for directions and parking details.

Saturday, March 23 from 1 to 3 p.m. — East Hill Farm Sugarhouse Tour Ted Butterfield, Colyer Rd., Guilford

“East Hill Farm Sugarhouse is a small, fairly traditional sugaring operation with about 1,200 taps more or less depending on the weather and what we feel like. We set about 1,050 taps in pipeline with about 400 on 3/16" line in a gravity situation and an additional 700 on some fairly modest vacuum. We also normally set an additional one to two hundred buckets because we need the exercise and we can't quite give up that part of the old ways. We usually produce between 200 and 300 gallons of syrup annually. We boil with a 40" by 9' wood fired

evaporator and have recently added a small size RO machine to increase efficiency.

As an interesting sideline, we are also the research and testing center for the Hot End System. The Hot End came into being when a technologically gifted friend was here on a cold day helping set up pipeline. His

comment was “Why don’t you have something to warm this tubing?” The reply was “Why don’t you build something?” He did and after a couple of years we started marketing the Hot End. For more details visit: <http://www.flushtec.com/products.html>

Ted will have a demonstration of his tubing tool known as the Hot End System as well as a few units for sale. Syrup will be available for sale as well.

Questions/Information: Sam Schneski — sam.schneski@vermont.gov

Directions:

I-91 to exit 2. **WEST** on Rte. 9 (travel 1.3 miles). Then **LEFT** onto Greenleaf St. (Just after [closed] 7-Eleven). Greenleaf turns into Hinesburg Rd. After 1.4 miles take a hard **LEFT** to stay on Hinesburg Rd. Travel about 3.9 miles **SOUTH** on Hinesburg Rd. Turn **RIGHT** onto Colyer Rd., and the sugarhouse is down the hill on the **LEFT**. Some parking is available at the sugarhouse. Otherwise, park along Colyer Rd.



April 27 and 28, 2019 — WRWA is co-sponsoring Game of Logging, Levels I and II, with the Windham Natural Resources Conservation District in Dummerston.

Game of Logging Chainsaw Course

Taught by Northeast Woodland Training in partnership with the Windham County Conservation District and Windham Regional Woodlands Association

Spring Session: Dummerston, Vermont. Registration opens March 1, 2019.

Level I: April 27

Level II: April 28

This program is designed for novice to advanced chain saw users. Novices develop safe and productive habits from the start, while experienced chain saw users improve their skills and “unlearn” bad habits and unsafe techniques.

In this hands-on training, one instructor works with a group of up to ten participants to ensure that each participant has time to practice the techniques and receive personal feedback. Participants receive individualized coaching at a series of in-the-woods

practice stations. By listening to explanations, watching demonstrations, and practicing techniques, participants come away with better work habits and greater confidence in their ability to safely fell trees and work in the woods.

Level 1 focuses on introducing the participant to open face felling and the development of techniques to safely use it. Topics covered include personal protective equipment, chainsaw



safety features, chainsaw reactive forces, bore cutting, pre-planning the fell, and understanding hinge wood strength.

Level 2 focuses on maximizing chainsaw performance through basic maintenance, carburetor setting, and filing techniques. Limbing and bucking techniques are introduced, spring pole cutting is covered and more felling is practiced.

Each session runs from 8am-4pm. The cost per session is \$175
To SIGN UP contact the Windham County Conservation District:
(802) 689-3024 or email windhamcountynrcd@gmail.com

Sunday, May 19 — Making Essential Oils And Plant Walk With Heart Grown Wild

Join herbalist Santalena Groves, Alchemist/Creator of Heart Grown Wild, LLC, an herbal skincare company based in Wardsboro, to take a deep dive into how essential oils are produced through live distillation of wild harvested plants. The purpose of the workshop is to educate attendees through a visual demonstration of the amount of plant material it takes to produce one drop of essential oil. Join us for a plant walk outside and learn first-hand how to make hydrosol and essential oil from start to finish.

Space is limited to 20 participants. Contact Dan Healey to sign up and to get the full agenda and location details. Email DHealey@longviewforest.com or call 802-387-6128. Details will also be posted on the WRWA website: www.windhamwoodlands.org

President's Message

By Marli Rabinowitz

Here it is February. It hasn't been much of a winter yet, but we have had a couple of nice snowfalls. Too bad it didn't get to -32F, the way it did in Minnesota. Apparently Emerald Ash Borer larvae hiding under bark can start to die at that temperature. (Some of us would rather die than live at that temperature too, while for others it is a nostalgic experience of winters past.) It's been a boring winter, overall. We need more snow! We have had some high winds though, and I lost some trees. Half of a popple tree crashed down near my house. I went to collect some of the sweet, sticky buds for medicinal oil since they were so easy to reach, but there weren't nearly as many buds as I expected. Someone was nibbling them. I took some but left many. Now they are all gone, only stubs of twigs remain. Every loss is a benefit to someone, voles and bunnies and grouse enjoyed the treat.

Every day brings a little change. The sun rises earlier, the melting snow drips through the cracks in my shed roof, and this morning a melodious, unfamiliar bird song caught my ear. The chickadees have changed their call too. My neighbor said, "When I hear that sound, it makes me think it's time for sugaring." It will be soon, and some may already have begun! Our seasonal rhythms may be a little out of sync but the wheel keeps turning. A new yearly habit I have formed is to roam the woods when the snow first melts and the ground is soft. That is when I have the best success at pulling invasives out by the roots; they are looser before they put out new rootlets that adhere to the soil. The more I pull now the less work later.

There is much news from within WRWA:

The program committee is really the heart of this Association, and Sam Schneski, Munson Hicks, Nick Haskell, Lee Todd and Dan Healey have put together a great year of programs ahead; we have at least one every month. Bill Guenther is leading a repeat of the snowshoe to Somerset old growth forest March 2; sign up by Feb. 26 as space is limited. And he has organized a Winter Tree Identification program March 9. Guess he misses time with you all! There is the Sugar House tour, Game of Logging, Making Essential Oils from Forest Plant Materials, and more to come.

Carol Morrison has sent a note; she is enjoying getting to know her new neighbors and new trails.

Cindy Levine, our staff person, is a grandmother! Madeleine Joy was born Jan 6. I saw a picture and she is so cute and of course a Joy to all who know her. However, this brought WRWA some unexpected news: unfortunately for us, they live in South Carolina and Cindy has come to the realization that time on the road and away will make it difficult to continue as the WRWA support staff. We are very sorry to lose her help, but she will remain a member and volunteer at times.

So, at the January Trustee meeting we discussed forming another hiring committee and decided that our staffing model needs some thought. We want time to consider. In the meantime your amazing

Trustees have rolled up their sleeves, climbed the rigging, and are sailing the ship! Updating membership lists, sending out donation letters, putting labels on newsletters. Very mundane, but fun when we work together — lots of time for conversation as we go.

This is a very good process: we are learning a lot about our membership, our data, and schedule of tasks. Please forgive if something is amiss and let us know. Carol calmly did so much, and Cindy after her; it is good to experience what it takes to keep this Association afloat. We are open to changes and may become a little more digital, but don't worry, we have had strong messages from members that our paper newsletter and other low-tech ways are important and appreciated, and we like them too. We will be looking for a new Clerk/staff person soon. Please mention this to anyone who might want to apply.

Here's another way you can help: the Annual meeting will be in August this year (we liked having a warm day). We have not decided where to hold it and are open to your ideas. We need a site in Windham County with an interesting, accessible forest to walk in, plenty of parking, a weatherproof and accessible place to eat and hold the meeting, a spot for the large grill, and portapotty or restroom. Please send ideas to Munson Hicks debandmunson@mac.com. Thank you!

Sustainability Through the Centuries: Forest Management in Germany and the Black Forest

By Margaret MacDonald, Trustee

On October 20, 2018, tree farmer Alan Robertson of Sheffield (featured in a Member Spotlight of the Fall 2018 newsletter of the Vermont Land Trust) presented a slide show and discussion on sustainable forest practices in Europe, primarily Germany. His central message was that after centuries of creating tidy forests consisting of mature trees in rows with no surrounding undergrowth, German foresters have recognized the need to promote sustainable, uneven-aged forests that have resilience against pests and storm damage.

As the first part of his presentation Al showed a briefing given by a German forester, Dr. Hermann Rodenkirchen to American foresters in 2003. German foresters had sensed that their forests “had

become sterile”; in addition, severe damage resulting from windstorms (notably Storm Lothar in 1999) prompted a fundamental shift in their approach to forest management. Present-day management practices involve relatively frequent harvests of mature trees and of trees that would be likely to come down anyway, but that preserve regeneration — “stems with a future”; clearcuts are not allowed. Foresters take a single-tree selection approach to forest management, treating clumps of trees that grow in close proximity to each other as a single tree.

The second portion of the presentation focused on Al's observations when he participated in a 2016 tour sponsored by the American Forest Foundation

through forests in Germany (including the Black Forest region and the area around Freiburg, which Al characterized as “Germany’s Burlington”), as well as in France and Switzerland. Everyone with whom the tour group talked in all three countries expressed concern about climate change and emphasized the need for greater forest resilience.

Germany’s new forestry philosophy can be traced back to Karl Gayer (1822–1907), a professor of forestry who advocated mixed stands rather than monocultures, and natural regeneration of forests. His counterpart in Switzerland was Henri Biolley (1858–1939).

A key point is that in Germany “foresters rule”: they tell the loggers and hunters what they can and cannot do in the woods. Because they play no role in the sale of wood from public or private property, their only motivation is enhancing the health of the forest. Foresters vigorously combat invasive species as soon as they are spotted. Anecdotally, the three main “rules” that German foresters follow are: 1) kill the deer; 2) poison the beeches (a very valuable species but prone to taking over the woods if left alone), and 3) let the sun in. To minimize the risk of wind damage, German foresters practice crown thinning, which leads to shorter trees with thicker trunks. All slash stays in the woods (partly on so-called “racks,” or side trails); Germany has no industrial forests, and heavy equipment is allowed only on designated trails and roads. Al’s slides showed how tidily cut logs are presented by the sides of the roads, coded and ready for sale.



Baron von Rotenhan, whose family has owned forestland for many centuries, told the tour participants that when he tours his woodlands he mentally asks each tree three questions: “Are you healthy? Are you producing value? What’s bothering you? (For example, is the tree’s growth re-

stricted by surrounding trees or by deer browsing, or are there signs of insect damage or fungal infection?) The answers form the basis for selecting which trees to cut, and for decisions about preventive measures.

In France, the group visited forests in the area of Colmar and Strasbourg. Al commented that the French are less careful than the Germans when harvesting and marking logs; they drag logs to roads; heavy equipment then drags them out. In Switzerland the group toured a niche forest that grows spruce for building musical instruments; one of his slides showed instruments actually carved into a tree. Tree limb pruning is practiced as high as 50' to produce the clear spruce appropriate for this use.



Al concluded his talk by examining the applicability of the single-tree selection approach to the Northeastern United States. While the approach mitigates the risks caused by long rotation to markets, diseases, and storms, the differences in the lumber markets between Germany and the United States mean that practices that have succeeded in Germany will not necessarily work well in this area. The approach will succeed for landowners who are committed to promoting healthy, multi-use forests and are growing high-quality hardwoods.

But in general good forests depend on good markets; Germany has many lumber mills, whereas the number of mills in New England continues to shrink. Success would require New England to have more small lumber mills, specialty markets for wood, skilled loggers, and foresters who understand the benefits of the single-tree approach,

natural regeneration, and uneven-aged, sustainable forests. Loggers would have to make enough money to buy good equipment, which minimizes damage while increasing efficiency. Species composition also plays a role: For example, in Germany beech is the most popular species for furniture and flooring, whereas there is practically no U.S. market for beech (or larch).

New England would also need more markets for low-quality wood. For example, Al noted that burning biomass for energy is actually profitable, even in the United States, but Vermonters typical-

ly take a “NIMBY” attitude toward biomass plants, and Act 250 and Act 248 create regulatory problems. The Vermont legislature would have to adjust Act 250 to permit the siting of more biomass plants, and Al does not believe this is likely to happen.

New England landowners, foresters, and participants in the forest industry could learn a great deal from their German counterparts. WRWA thanks Al Robertson for a thought-provoking and entertaining program.

Current Use Program

By H. Munson Hicks

Last November, the Windham Regional Woodlands Association hosted a talk by Sam Schneski, newly appointed Windham County State Forester, on the Use Value Appraisal (UVA) program in Vermont. More than twenty people attended, a cross section of landowners, loggers, foresters and other interested people.

As the first in a series of talks planned on UVA topics, Sam gave an outstanding overview of the program, its origins, and how it has evolved over the years. While primarily focusing on the forestry aspects of the program, he nevertheless touched on the agricultural sections as well.

The Use Value Appraisal Program (UVA), also called “Current Use” or “Land Use” and established in 1980, is arguably the most successful state program for conserving Vermont’s working landscape. Statewide, there are 19,000 parcels of land enrolled in the UVA program comprised of 1.9 million acres of forestland and 500,000 acres of agricultural land. Windham County’s UVA enrollment totals 1,682 parcels covering almost 200,000 acres. By achieving a greater equity in property taxes on undeveloped

land, the program has kept forest and agricultural land in active production.

A key to the forestland program is the commitment to manage the land to a state-defined standard. Signing and submitting a ten-year forestry plan is only the first step for a landowner. You are joining a statewide community of forest stewards. There is much to learn about your own forest, and there are ongoing communications with the county forester, your consulting forester, and the current use arm of the state tax department.

The talk was followed by a number of questions and discussion about the program and its effect on landowners.

WRWA plans to sponsor future talks on UVA for realtors and for managing forest land as a business, touching on tax law, liability of ownership, and more.

A BCTV video of the talk can be seen at: <https://www.brattleborotv.org/vts-current-use-program-windham-county-forester-sam-schneski>

“The Dream”

By Phyllis A. Weltz, WRWA Treasurer

When we first moved to Vermont in June 1967, we settled in Bellows Falls, renting our first house, which we bought a year later. At that time, we had our first son, Rich, who was followed by Chris in 1969 and then Rob in 1972. It wasn’t until 1985

that Hans finally found his “perfect” parcel of land. He had been looking for years, and he was able to buy a 149.7-acre parcel on Wiswall Hill in Newfane. His dream was to eventually build a house there, and finally the search was over. He

built a small cabin for himself, so he could be out in the woods and stay over whenever he wanted. It was his retreat. Later on, we even had a “barn raising” with friends and family. Hans loved to walk the land and hunt with friends.

Where did the time go? In May of 2000 Hans was killed in a tractor “roll-over” on his land. He was cremated, and his ashes scattered around the huge, granite outcropping he described as his “head-stone” when he first discovered it many years ago.

Last year we decided it was time to transfer the land to Rich and Rob (Chris had passed away previously), as we all agreed we never wanted to sell

it. We went through the process of transferring the parcel and continuing it in the Current Use Program in September of last year. Things went very smoothly, thanks to Bill Guenther and Sam Schneski, who took over Bill’s position of Windham County Forester. Rich went to the Current Use website and completed the application and made sure all the necessary attachments (thanks to forester Andy Scheere) were sent to Sam – a very easy process.

Now it’s up to the boys to continue their father’s legacy and continue to keep the land in the Current Use Program and not develop it – except to build their own houses one day, if that’s what they want.

Vermont Forest Health Report Highlights 2018

*Vermont Department of Forest, Parks and Recreation, Forest health Program
Summarized by Sam Schneski, Windham County Forester*

Vermont’s forests cover about three-quarters of the state and include billions of trees. Eighty percent of the State’s forest land is privately owned with 11% under Federal management in the Green Mountain National Forest and 8% managed by the State of Vermont. Sugar and red maple and eastern hemlock are the most common species by number and volume. Statewide there are roughly 18,700 parcels enrolled in the Use Value Appraisal (UVA) program and 2.5 million acres enrolled. In Windham County there are approximately 1,700 parcels and 194,000 acres enrolled in UVA.

In 2018 the statewide aerial detection survey was conducted. 128,872 acres were surveyed (mapped areas of interest) representing just under 3% of our forestland. This was an increase from 98,555 acres mapped in 2017, mostly due to defoliation by forest tent caterpillar and white pine needle damage. These two defoliators accounted for 55% and 32%, respectively, of the area mapped.

Temperatures for meteorological winter December 2017 through February 2018 averaged near normal. Some extreme swings were included. Snowpack dropped in February, followed by an above normal snowfall in mid-March with three major snowstorms. Below normal rainfall continued from May to early July statewide. The beginning of a heat wave set in at the end of June with temperatures above normal for the rest of the growing season. Moderate drought started in southern

Vermont around June 26th. Weather patterns shifted and brought some moisture to the southern counties while the northern counties stayed dry and were in severe drought conditions until the end of October near the northern border. Following the drought of 2016, the late-season dry conditions in 2017, and the prolonged period of warm, dry weather in 2018, water availability continued to be a major driver of tree health and will continue to interfere with tree recovery from defoliation and other stressors.

As of late February 2018, three areas of the state had been discovered to have emerald ash borer. The first find was in Orange and reported by a consulting forester to vtinvasives.org. Follow-up surveys found presence in more towns in the eastern/central region of Vermont including Barre, Plainfield, Groton, and Montpelier. This past summer two beetles were found in purple traps in the southwestern town of Stamford. To date, no affected trees have been found there, just the two beetles with one on each trap. Assuming this infestation does not do anything too surprising, surveys will be repeated each fall/winter for a couple of years until it is found in Stamford or a surrounding town. Then the search area will be expanded to contain the towns adjacent to any newly infested towns. In late September an off-duty forester reported symptomatic ash trees in South Hero.

Subsequently the presence of EAB was confirmed through delineation surveys.

As a result of finding EAB in multiple Vermont locations the Vermont Pest Advisory Committee determined that an intrastate quarantine would unnecessarily divert resources to areas that do not pose a risk, since the federally required quarantine boundaries would not align with the infestation in Vermont. By foregoing an intrastate quarantine, all of Vermont became part of the USDA quarantine. Resources were focused on developing slow-the-spread recommendations for preventing unintended movement of EAB, and information about ash management. Slowing the spread of EAB to non-infested areas slows tree mortality and financial impacts and allows time to implement management, as well as develop better tools for protecting ash. For more details visit vtinvasives.org.

Populations of native forest tent caterpillars (FTC) were on the rise this past growing season. Most of the defoliation was found to be in northern Vermont with some spotty areas of FTC in the Westminster area of Windham County and some areas in northern Bennington County and southern Rutland County. Most reports from sugarmakers who chose to have an aerial application of Foray48, a *Btk* product that is registered for use in certified organic production, were that the application was successful at killing FTC.

The presence of native maple leaf cutter (MLC) damage to lower foliage was noticeable statewide in July but became unusually heavy by early September, when browning and defoliation of entire stands was obvious in many locations. This defoliation was monitored in early September in 36 maple monitoring plots. Heavy defoliation was reported from plots in northeastern and southeastern parts of the state with moderate defoliation observed throughout the state. Due to the late timing of defoliation in the growing season significant impacts to tree health were not expected.

White pine needle damage was widespread again. Much of the damage is in lower crowns and hard to accurately detect by aerial surveys. The damage has been attributed to a complex of fungal pathogens. This damage has been widespread since 2010 and the current epidemic has been building at least since 2005. Needle damage generally affects the same trees each year and some crowns are now very thin as a result. When other stress factors are present, severe decline and mortality can result.

Hemlock wooly adelgid remains centered in Windham County. In the winter of 2017–2018 the winter mortality average was 94%, which is considered adequate to restrict expansion of the infestation. The emphasis of FPR's delineation survey program was shifted to focus on counties adjoining infested counties. Twenty sites were surveyed prior to summer 2018, targeting Rutland, Orange, and northern Windsor Counties. No expansion of the infestation was detected. *Laricobius nigrinus*, the predatory beetle, was not recovered during fall sampling of the three sites where they had been released in 2009, 2012 and/or 2017, so the status of this introduction remains unknown. Exciting new research out of the university of Rhode Island has shown that there are rare eastern hemlock individuals that appear resistant to hemlock wooly adelgid.

Compounding the risk to hemlock is the elongate hemlock scale (EHS), which has become increasingly noticeable in Windham County. Elongate hemlock scale was first detected in Vermont in 2014 in Brattleboro and Guilford. The combination of EHS and HWA can be enormous stressors on hemlock trees.

For a list of other exotic pests threatening Vermont, and to see the full 2018 forest health highlights, visit https://fpr.vermont.gov/forest/forest_health/current_health

For a more in-depth look at the HWA-resistant hemlock research, see the following article.

A Three-Year, Six-State Reforestation Trial In HWA Infested Forests: “Lingering” Eastern Hemlocks Substantially Outperform HWA-Susceptible Hemlocks

By Ian G. Kinahan, M.S. candidate
Department of Biological Sciences
University of Rhode Island

The hemlock woolly adelgid (*Adelges tsugae*; HWA) is an invasive sap-sucking insect that has caused widespread mortality and decline of eastern hemlock (*Tsuga canadensis*; hemlock) in north-eastern U.S. forests. Decades of research have gone into mitigating its impact, largely through insecticide treatments and/or biological control. Unfortunately, as most of us woods-walkers and naturalists have seen, we’re still losing hemlocks, and our forests remain vulnerable to devastation by HWA. In response to this, my lab group has taken a unique approach to reducing the impact of this pest: identifying apparently healthy eastern hemlocks that “linger” in HWA-devastated forests, evaluating them for naturally occurring HWA resistance, and testing the potential for these trees to be used in reforestation.

As early as 2008, my lab group was receiving reports of individual healthy, mature eastern hemlocks persisting in hemlock stands otherwise destroyed by decades-long exposure to HWA. The lab group and (later) I visited these sites and confirmed that the trees were HWA-free and thriving. To find out whether these trees were HWA-resistant, my lab collected stem cuttings, grew them in a controlled setting (our greenhouse) for two years alongside cuttings from susceptible eastern hemlocks, and conducted HWA resistance trials. We found that these lingering trees supported lower HWA densities, and also differed in the anti-herbivore defensive chemicals found in their needles and stems.

This was a fascinating discovery, but we needed to address the question of whether lingering hemlocks could be used to mitigate the impact of HWA in our eastern forests. In 2015, we planted rooted stem cuttings from both lingering trees and HWA-susceptible control trees in forest plots located in six eastern U.S. states. The trees were protected from deer browse, but otherwise left undisturbed to grow for three years. In the fall of 2018, I revisited many of these sites and collected data on the mortality, growth, trunk diameter and vigor of each tree; state foresters surveyed sites that I could not reach. I found that 96% of lingering eastern hemlocks planted in HWA-infested forests survive, compared to just 36% of HWA-susceptible hemlocks. Among surviving trees, lingering eastern hemlocks outperform susceptible hemlocks across all categories of tree health: they are 42% taller, have 41% thicker stems, put out 48% more lateral growth, and overall, are 25% healthier than susceptible trees.

Our results confirm that there is substantial variation in eastern hemlock resistance to HWA and show the potential for exploiting naturally occurring HWA resistance to restore hemlock-associated forests. In 2017, HWA reached far-western Michigan. It continues to burn its way through to the end of eastern hemlock’s natural range. Reforestation with HWA-resistant eastern hemlocks may be our last hope in preventing irreparable loss of biodiversity in forests of the eastern U.S.

Safety in the Woods

By Bob DeSiervo, CSP
WRWA Trustee and Safety and Health Consultant in Townshend

We enjoy the woods for a lot of different reasons. Some enjoy animal viewing, hiking/exercise, timber and firewood harvesting, etc. Some activities have a degree of risk not always obvious. In this discussion I’d like to point out a good means of identifying and controlling energy to the degree possible, the risk it has, and how we can continue to enjoy our woods and forests safely.

Safety — is defined as freedom from harm/injury. How do we achieve this? First, let’s point out that injuries are all caused by an energy exchange greater than the body can tolerate — no exceptions. Energy comes in many types and forms.

For example, **Potential** — *Stored energy*. **Kinetic** — *Energy of motion*. **Fire** — *heat/thermal energy*. **Electricity** — *electrical energy*. **Elevation difference** — *gravitational/potential/kinetic energy*, and **punctures/abrasions** — *mechanical energy*. There are a lot more examples.

When we're in the woods, some of these energy sources are obvious. The chainsaw uses an energy source, generally gasoline and oil, and creates an unguarded/exposed hazard in the revolving cutting chain, capable not only of cutting wood but also flesh. In addition to a falling/felled tree, dead tree branches are capable of breaking bones when gravitational energy becomes mechanical energy and the branch strikes a person.

One of the reasons forests/woods can be dangerous is because some hazards are not obvious. The stored energy in a dead branch 30 feet above the ground is considerable, for example. Sometimes the hazards are easy to spot, sometimes not so much. When the tree is felled for firewood or timber it may contact other trees and branches as it falls, and these can sometimes take unforeseen trajectories. Branches can act like rubber bands, with considerable energy, and shoot a significant distance in a random direction.

In controlled environments like a factory or workshop, energy sources can be identified. A piece of machinery may be powered by electricity, compressed air, hydraulic fluid, or use a flywheel, spring or capacitor to make the machine work. Practices and procedures can be developed to adequately address and control these energy sources so that workers are not injured. The woods/forest is a little different.

Weather is a factor. Wind, particularly gusts, can influence when dead branches fall and where cut trees land. Rain, ice and snow can make the ground slippery causing slips, trips and falls. Lightning kills many people in the United States every year.

We should be able to identify and thereby control many of these energy hazards.

However, there can be occasions when mishaps happen. In these cases, using a mitigating inter-

vention can prevent, or control to a degree, the energy event from becoming catastrophic. For example, wearing Kevlar chaps when using a chainsaw. When the spinning chain contacts Kevlar chaps, the Kevlar fibers tangle in the chain, stopping it and helping to prevent cuts to the flesh/bone. Similarly, hard hats, hearing protection, safety glasses, etc., control or reduce untoward effects of the potentially injurious energy. Personal Protective Equipment (PPE), which does nothing to *reduce* the energy/hazard, must be properly chosen, worn and maintained. PPE *minimizes/mitigates* the consequences of the exposure to the energy/hazard.)

Having appropriate First Aid also helps to reduce the consequences when uncontrolled energy comes in contact with people. Cuts and punctures can be controlled with blood stop, gauze, etc. Having our transportation (e.g., ATV) pointed in a direction for quick egress out of the danger zone helps to get quicker emergency care and can make a difference in a time sensitive situation.

I hope this short discussion points out the need to be aware of energy in your environment, in an effort to control it to the degree possible, and if not possible, to take steps to mitigate the consequences.

When I was in graduate school, Dr. William Haddon and his injury prevention and control concepts/theory (**Haddon Matrix and 10 Strategies**) were an important part of the curriculum. Those wishing for more information can explore Dr. Haddon's work in the references below. (Dr. Haddon, an engineer and emergency physician was appointed by President Johnson as administrator of the newly created National Traffic Safety Agency and the National Highway Safety Agency to help reduce the growing number of deaths and injuries from traffic accidents. The two agencies were consolidated in 1967 into the National Highway Safety Bureau; in 1970, it became the Nation Highway Traffic Safety Administration and he later became the president of the Insurance Institute for Highway Safety.)

(See box below for additional resources.)

Safety/Injury Prevention Resources

<http://injuryprevention.bmj.com/content/1/1/40.full.pdf?sid=0e46d567-3cc5-4180-9154-056b903f6cbc>

<https://apps.dtic.mil/dtic/tr/fulltext/u2/a372985.pdf>

<http://www.iihs.org/frontend/iihs/documents/masterfiledocs.ashx?id=692>

Adapting Forests to Climate Change — Healthy Forests are Not a Luxury

*By Keith Thompson, Private Lands Program Manager and
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Vermont Department of Forests, Parks and Recreation

The two dry summers of 2016 and 2017 marked a challenging time for trees. Lack of water, high temperatures, and dry soils added to the growing list of environmental stressors that often tax Vermont's forests. Sometimes, stress can trigger development of larger-than-average seed crops, and by most reports, the maple seed crop of 2017 was massive. All over Vermont, maple seedlings sprung from the moist soils that followed snow melt this past spring.

However, most of Vermont remained in moderate drought this summer. Some foresters reported that large numbers of first year seedlings had withered and died. In Essex and other Northern Vermont counties, at least 4,500 acres of overstory maples were killed, with some patches hundreds of acres in size. The compounding stresses of forest tent caterpillar defoliation and drought stress, coupled with the loss of energy used in producing large seed crops, likely resulted in heavy crown dieback and mortality of these trees.

Fortunately, the maple tree deaths of 2018 were not widespread. The resulting landscape, however, is a reminder that chronic climate-related stresses are having real impacts. Vermonters depend on our forests for all kinds of benefits, from clean water and wildlife habitat to maple sap and sawtimber. In this real time of climate change, we also count on forests to store carbon. Vermont forests are estimated to capture more than half of the state's annual emissions. By providing so much for Vermonters, healthy forests are critical in our efforts to slow, and adapt to, climate change. As such, healthy forests are not a luxury; they are a practical imperative.

Compared to 50 years ago in Vermont, winters are warmer and shorter, summer days are hotter, and storms are more intense. The degree and rate of climate change is expected to increase. These changes will affect where certain plants can grow, and where animals thrive — or don't.

Part of the solution to climate change is to remove carbon dioxide from the atmosphere and in Vermont, trees and forests do it best. Because 76 percent of Vermont's forests are privately owned, some of the most important work we can do right now is to help private landowners sustain and enhance the potential of their forests to absorb and store carbon. This contribution to the climate change solution depends on a lot of healthy forest, a landscape that shouldn't be taken for granted.

For decades, foresters, biologists and researchers have been collaborating to understand how to moderate the vulnerability of forests to climate change and improve forest health. For individual landowners, helping forests adapt to climate change could include actions like:

Retain Connected Forests

Reduce or eliminate the conversion of forest to non-forest conditions and avoid dividing blocks of forest in to smaller pieces.

Reduce Stressors

Limit forest stressors like invasive plants, root damage from management activity, excessive deer browse or others.

Reduce Vulnerability

Address conditions that make forests susceptible to damage, such as the dominance of a single

species, large numbers of pest-susceptible tree species (think ash trees and their pest, the emerald ash borer), overcrowding among trees, and the lack of regeneration of climate adapted tree species.

Provide Refuge

Protect habitat for rare, threatened and endangered species or currently common species that we may lose as the climate changes.

These recommendations are applicable across the landscape but the specifics of how they are achieved on a given property will depend on the characteristics of the forest and the goals of the landowner. Fortunately, there are many “right ways” to help forests adapt to climate change and many resources available to help.

The four goals identified above came from Increasing Forest Resiliency for an Uncertain Future written by Paul Catanzaro, Tony D’Amato, and Emily Silver Huff. This is a solid resource for landowners and foresters that distills the current thinking about what threatens forest health, what supports it, and what activities promote it. It also provides a process for considering these actions on your specific land. With easy-to-understand lists and helpful graphics, it puts the ideas behind forest resilience in one *readable* place.

A more in-depth resource is:

Creating and Maintaining Resilient Forests in Vermont: Adapting Forests to Climate Change, published by Vermont Department of Forests Parks and Recreation. This report covers specific strategies to adapt forests to climate change, including a species-by-species summary of how trees are expected to respond to climate change. This resource provides a level of detail that can help in developing site specific recommendations.

Forests owned and managed by private landowners are part of the solution to Vermont’s biggest challenges: flooding hazards, Lake Champlain water quality, maintaining a vibrant rural economy, providing world-class outdoor recreation, keeping our residents healthy, and addressing climate change. But our forests can only be part of the solution to the extent that they are healthy and able to adapt to the changing climate. For this reason, we need to make sure that the management we do on our own land supports, and does not undermine, forest health. By adapting our management, we can help our forests, and ourselves, adapt to a changing climate.

More information about forests and climate change can be found at:

https://fpr.vermont.gov/forest/ecosystem/climate_change

When I Am Among the Trees

*When I am among the trees,
especially the willows and the honey locust,
equally the beech, the oaks and the pines,
they give off such hints of gladness.
I would almost say that they save me, and daily.*

*I am so distant from the hope of myself,
in which I have goodness, and discernment,
and never hurry through the world
but walk slowly, and bow often.*

*Around me the trees stir in their leaves
and call out, “Stay awhile.”
The light flows from their branches.*

*And they call again, “It’s simple,” they say,
“and you too have come
into the world to do this, to go easy, to be filled
with light, and to shine.”*

— Mary Oliver, 1935-2019

Vermont Coverts: Woodlands for Wildlife 2019 Free Woodland Owner Cooperator Trainings

A healthy forest can enhance wildlife habitat and provide recreational and timber benefits. Learn to be a Cooperator by signing up for the *Vermont Coverts* three-day Woodland Owner Training. You will connect with resource professionals and other landowners while learning how to improve your woodlands. The two 2019 trainings are May 17–19 at Common Ground in Starksboro and September 6–8 at Kehoe Conservation Camp in Castleton. To learn more, visit www.vtcoverts.org. You can also call Lisa Sausville at 802-877-2777 or e-mail lisa@vtcoverts.org. This Training is **FREE** (a \$100 deposit, refundable upon completion, is required to hold your spot).

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Upcoming Programs

(See inside for details)

Saturday March 2	<i>WRWA Members Only Field Trip</i> Somerset Old Growth Forest Tour with Bill Guenther Sign up by Feb. 26th,
Saturday, March 9, at 10 a.m.	Winter Tree Walk and Potluck Lunch, Halifax, Vermont
Saturday, March 23, from 1 to 3 p.m.	East Hill Farm Sugarhouse Tour Ted Butterfield, Colyer Rd., Guilford
Saturday and Sunday, April 27 and 28	Game of Logging, Levels I and II, Dummerston Registration opens March 1, 2019.
Sunday, May 19	Making Essential Oils And Plant Walk With Heart Grown Wild

Mission of Windham Regional Woodlands Association

WRWA is a non-profit association of woodland owners and managers, members of the wood products industry, and other interested parties in the Windham County Region who advocate both sustainable management practices and the enjoyment of forests and their ecosystems. In support of these ends, WRWA offers educational opportunities for all age groups. Areas of interest include: biodiversity; clean air and water; cultural and historic resources; fair and equitable taxation of woodland; forest products; recreation; scenic beauty; and wildlife habitat. We recognize that these concepts are continually evolving and therefore will strive to consider the most current thinking and values regarding them.