



130 Austine Drive, Suite 300, Brattleboro, VT 05301-7040
802-257-7967

WOODLOT TIPS



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SPRING 2016

Programs

Thursday, June 23, from 5 to 7 p.m. — Cersosimo Lumber Company Tour

Please join us for an evening tour of a modern double-cut band sawmill operation that produces hardwood lumber and White Pine lumber from local forests. The lumber reaches markets all over the globe.

Dress appropriately for a short hike with appropriate closed-toe footwear — no sandals or flip-flops, please! Hearing protection and safety glasses will be provided. *No Children under the age of 12 and no pets, please.*

A head count by Monday June 20, 2016 would be helpful. Contact John Caveney by Monday, June 20, so he will have a headcount for the tour.

Directions: Cersosimo Lumber Company, Rte. 142, Brattleboro, Vt.: From the South end of Main Street, Brattleboro, take Route 142 South approximately 2 miles and look for a red office building with the Cersosimo sign on your right. Park across the road.

Questions? Contact jcaveney@cersosimo.com or call 802-254-4508 Ext. 129

Thursday–Saturday, July 28, 29, and 30 — Maplerama 2016, Grand Summit Resort Hotel and Conference Center at Mount Snow, West Dover

Every year, rotating through 12 counties, Vermont hosts an event known as Maplerama. This multi-day event celebrates Vermont’s maple sugaring heritage and gives folks an opportunity to learn about the latest technology and industry trends. The Windham County Maple Association is hosting this year’s event.

Typical attendance is around 300 people who come from at least 20 states and five Canadian provinces. The main attraction is the tour of local sugarmaking operations. In Windham County these have ranged from operations that collect sap the old fashioned way using horses, buckets, and a wood-fired evaporator to a 25,000-tap business utilizing state-of-the-art high vacuum systems, reverse osmosis, and a steam-powered evaporator.

This year’s event will feature tours of at least 12 sugarhouses and two maple-based value-added facilities, including businesses making liquor and granola! An evening banquet will feature awards to outstanding contributors to the maple industry and entertainment by comedian Bucky Lewis. A trade show will feature equipment and supply vendors, a maple syrup tasting contest, and a silent auction. The final day of the event will feature more sugarhouse tours, visiting vendors, and a barbeque luncheon with an option to ride a chairlift to the top of Mt. Snow. Tickets are on sale now and more information can be found at <https://www.facebook.com/Maplerama-2016-795308530606693/?fref=nf>

Saturday, September 24 — SAVE THE DATE!

WRWA Annual Meeting at the Green Mountain Camp, Dummerston.

Forrest Hammond, biologist extraordinaire and head of the Black Bear Management Program with the VT Fish and Wildlife Department will give a presentation on The Black Bears of Vermont. The talk will be on the behavior and life requirements of this iconic forest species as well as on the challenges of managing for quality bear habitat and dealing with increasing numbers of bear-human conflicts.

The annual meeting also will include a field trip to a woodlot near Green Mountain Camp. Possible topics includes silviculture, invasive plants, ecology and forest ownership and management through multiple generations.

TRUSTEE MEETING INVITATION

Would you like to learn more about WRWA operations? We invite members to attend the quarterly Trustee meetings held on the fourth Thursdays of January, April, July, and October, from 4:00 – 6:00 p.m. We meet in an Extension conference room on the third floor of Holton Hall at the former Austine School (130 Austine Dr., Brattle-

boro). While you won’t have a vote on WRWA business matters, you absolutely will have a voice. We welcome your input, and you may decide to join a Committee or consider becoming a Trustee. If you have questions, please contact Linda Lyon at 802-368-2211 or LindaALyon@gmail.com.

OUR REJUVENATED LIBRARY

The WRWA Forest Management and Ecology Library is up and running, thanks to the VERMONT LEARNING COLLABORATIVE — thus now being conveniently located at 471 Rte. 5 in Dummerston and open every Monday through Thursday from noon to 5 p.m. The holdings currently consist of about three dozen technical books, perhaps as many important state-published and other pamphlets, and a run of useful back issues of *Northern*

Woodlands. Included are a number of excellent how-to woodland management guides plus a variety of local natural history texts and relevant field (identification) guides. Many of the holdings are by local authorities. WRWA members are welcome to borrow any item on the honor system for up to three weeks. Finally, relevant donations are always welcome, regarding which please contact the Library Committee (westing@sover.net).

President's Column

By Martha (Marli) Rabinowitz

Wait, isn't Sam Rowley the President. Where is Sam Rowley?

Sam has a great new job in northern Vermont (See below). He's moving up there soon and needed to resign his post with WRWA before our regular elections at the annual meeting. We will miss Sam and hope he still can come to some events.

In an act of desperation, the board elected me President pro tem. You can remedy this situation by stepping forward in September to join the board and get in line for next time.

At the same meeting in April, Linda Lyon accepted the duties of vice president. She is very skilled at keeping the rest of the board on track so all will be well. Trustees can serve for no more than two consecutive three-year terms, so it would be great if everyone from the membership took a turn. Please contact us if you would like to do so.

WRWA is just about my favorite organization and I am happy to be able to help out this way. Good mission, good people. I remember the first meetings I went to over twenty years ago, sitting timidly and listening to all the old(er) men in plaid flannel shirts. (Everyone looks a lot younger to me now!) The annual meeting was more like a reunion: people who had been outdoors all summer, sitting outdoors together for a barbecue and swapping tales and tips, questions and answers. It seemed pretty straightforward to own land or work in the forest and manage it carefully over fifty years or so.

Of course it was never that simple, but I do think that forests are more complicated now than they were, with invasive plants and insects, endangered species, deer browse affecting regeneration, and international trade affecting lumber prices and mills. And the legal and financial issues of land ownership and stewardship are more complicated as well. Legislation at the state and federal level can affect us in ways we don't expect, and is influenced by diverse interests with many agendas. WRWA has evolved too, and we present a lot

more educational opportunities to help us all find our way through all this.

Although our name used to be Woodland Owners Association, our membership always included farmers with woodlots, loggers, foresters, mill owners, furniture makers, and more. Perhaps you are growing and marketing alternative forest products. Please let the board know if you have interests/needs that we are not addressing. We are here for our members, not the other way around! Remember that if you have an idea, you can always be on a committee without being on the board. Committees are groups that accomplish specific tasks: moving our library, creating events, all from ideas of the membership. We are a small organization and every member has something to offer. Of course being a member is enough, and we hope you enjoy this issue of the newsletter and perhaps we will meet at an event this summer.

As I am writing this, the first bloodroot flowers are opening at the edge of my woods and the willow catkins are covered in yellow pollen. Soon the maple trees and oak trees will have their pale flowers hanging. Last year the flowers of the black locust trees were abundant in places I never noticed black locust before. A sign that there are "new" species in the woods that have fit right in, are useful to pollinators and also as lumber: they are not "invasive." Apples are the same, an introduced species that benefits insects and all who love to eat apples. And the wood also has many uses. They spread but do not crowd out other species. I try to remind myself of this good thought while murdering invasives, and I will spare you the now familiar rant about *them* right now!

I hope that you get to spend a lot of time outdoors this Spring, as the tree flowers open, leaves emerge, and the sounds of the birds entrance. I hope we have rain, sun, and warmth all in the right amounts, and that all who work outside have a safe season. The health of our forests is the basis of both our ecology and our economy; as stewards we have a big responsibility, but what could be more enjoyable!

Sam's Farewell

By Sam Rowley

Another beautiful Vermont Spring is upon us as bumble bees buzz about and leaves slowly unfurl from their winter buds. Spring brings change, growth, colors, and smells. People who value the outdoors and our exquisite woodlands have undoubtedly been observing these changes for weeks during the interesting season we are experiencing.

This spring I must regretfully step down as president of the Windham Regional Woodlands Association. I have taken a job with the Green Mountain Technology and Career Center (GMTCC) up in Hyde Park, Vermont. I will be starting a new sustainable foods and agriculture program for the Center. The program will prepare high school students to actively participate in the food system of Vermont to produce, market, and consume locally grown food. With access to a farm site in Lamoille County, not far from Mt. Mansfield, my students and I will become part of Vermont's working landscape on open pasture and in the forest. I am excited to embark on this challenge, but sad to leave the community of Southern Vermont.

If you are reading this, you are already aware of the importance of harnessing and conserving Vermont's unique and rich natural resources while they improve the state's economy. With the resources we have, we also need people to work and live successfully and sustainably to keep a population that can thrive in our state. Providing jobs in Vermont that young people can make a living at is a top priority for the health of the state's economy.

Our woodlands and the outdoors also need to be safe environments for people to work. This winter was one of the mildest on record, according to experts. Consequently, there are predictions for an especially bad season for ticks. I have personally found an abundance of ticks crawling on me, earlier than usual, since winter. This suspected higher population of ticks has been noticeable to me despite some proactive attempts to lower the population directly around my residence. I have been trying a product called Tick Tubes. This product attempts to reduce tick populations at their early life stage while living on mice. Ticks often start their life on mice, then gradually work their way up to larger mammals, like humans and pets. The cardboard Tick Tubes are slightly expensive, but

can potentially be made at home. The way the product works is by introducing treated material to mice bedding. As mice collect nesting materials, they find the Tick Tubes with permethrin-soaked cotton balls. Permethrin, which kills ticks, is an insecticide in the pyrethroid family. The collected cotton has direct contact with the mice as they live and sleep in the nest, and the permethrin in the cotton will kill the ticks on the mice.

The Tick Tube method seems ingeniously simple, with positive results when correctly introduced, and has low impact on other wild or domestic life. I see this method as part of a larger offensive to combat ticks. Landscaping, tick barriers, and invasive plant removal should also be worked into the plan.

Of course, there are always caveats to using any insecticide, so it is important to be judicious in its use. Last summer, I studied up on bumblebees after observing a bustling nest at the edge of the woods. According to the Vermont Center for Ecostudies, more than one-quarter of the bumble bee species in northeastern North America have either vanished or are in serious decline. These social or solitary bees are often the first out in spring and the last in fall. Their pollinating duties are extremely important to food production and the natural world. When I learned that some bumblebees make their nests in abandoned mouse nests, I immediately thought about the Tick Tubes. I have found few studies addressing this conflict, and have read about others with the same concern, so if and when I cautiously employ the tubes, I will be observing the bumblebees as well.

In closing, I want to sincerely thank the members and the board for allowing me to be part of this organization and commend you for your commitment to our local woodlands. Please try to recommend fellow landowners or anyone who values our Vermont woodlands to join. Memberships support the association, great local programs, and scholarships to further the health and productivity of the natural world. I am proud to have been part of the Windham Regional Woodland Association, but now must say goodbye.

With all best wishes, Sam Rowley.

Firewood Quarantine Now in Effect in Vermont

By Bill Guenther, County Forester

(with excerpts from Department of Forests, Parks & Recreation (FP&R) documents)

For the last several years, Vermont has been threatened by Asian Longhorned Beetle (ALB) and Emerald Ash Borer (EAB), with the latter having surrounded the Green Mountain State. We know all too well the devastating impact these insects can have on our hardwood forests. Human movement of firewood is the most common way by which these insects spread into uninfested areas. To combat this, some New England states implemented a number of quarantines that amounted to a patchwork quilt of different regulations. Maine took the initial step of banning out-of-state firewood from coming into the state. Vermont's only restriction was that campers at state parks were not allowed to bring in firewood that came from more than 50 miles away. As the threat increased, FP&R realized that we needed a much stronger set of regulations and embarked on a rulemaking process that would address this issue. On May 1 of this year, Vermont's Firewood Quarantine Rule went into effect to help protect the health of our forests.

The quarantine bans the importation of any *untreated* firewood into Vermont. ***Firewood is defined as wood processed for burning and less than 48 inches in length.*** Firewood does not include wood chips, pellets, pulpwood, or wood for manufacturing purposes.

Research has found that kiln-drying firewood to a certain temperature for a certain duration will kill virtually any insect hiding inside, with different times and heat values for each type of insect. For our quarantine, we chose the highest standard set by USDA APHIS (Animal Plant Health Inspection Service), which will kill both ALB and EAB. To meet this standard, the wood must be heated to a temperature of 160 degrees F for at least 75 minutes. Treated firewood must be accompanied by certification of treatment, such as a phytosanitary certificate, invoice, bill of lading, or label

stating that the firewood has been heat treated to the 160° F/75 minute standard.

By written request, FP&R can grant a waiver allowing untreated firewood to be moved into Vermont, but only if this poses a minimal threat to forest health, and the movement is not restricted by existing state or federal pest quarantines. These waivers will likely only be granted if the wood comes from a town very near the Vermont border. So far the only exception was granted to someone who has a camp up north in Pittsburg, NH, and lives in Canaan, Vermont. Waiver requests must be submitted to Barbara Schultz, our Forest Health Program Manager in the Springfield Regional office. The Agency of Natural Resource's Enforcement Division will handle enforcement activities.

The keys to making this program a success will be conducting good public outreach and preventing any suspect firewood from entering Vermont. Our Department will be ramping up efforts to get the word out, and we have already been working with private campground owners to alert them to this new rule. The bulk of our resources will be targeted to alerting the folks who would be most likely to bring firewood into the state. The last thing we'd want to see would be a landowner from an EAB-infested state such as Connecticut who has a tree die on his lawn (but is not sure why it died!!) and cuts the tree down. He now has a lot of firewood; not knowing about the quarantine, he decides he can burn it at his Vermont camp and brings the wood up into our state. We must do all we can to avoid this worst-case scenario.

To keep our state free of invasive insects, let's all do our part by not providing a means of transport. Please only use firewood from local sources in state or, if you're buying out-of-state firewood, make sure it is certified. For example, Treehugger Farms in Walpole, NH (which WRWA toured in 2010) does treat all of its kiln-dried firewood to the APHIS specs.

Tick information resource — This Consumer Reports table shows insect repellent ratings and also has information about ticks.

http://www.consumerreports.org/content/dam/cro/news_articles/health/Consumer-Reports-Insect-Repellent-Ratings-February-2016.pdf

The Iceman's Gear

By Carol Morrison

Five thousand years ago in what is now the Italian alps, a man was murdered — shot in the back with a flint-headed arrow and left to die on the glacier. He and all his traveling gear froze quickly and were covered with tons of snow and ice. Five millennia later, the glacier thinned, revealing the man's mummified body. It was discovered by two hikers in 1991.

He has been nicknamed Ôtzi (pronounced Ootsie) the Iceman, for the place he was found. His remains, and all his gear, now reside in the South Tyrol Museum of Archeology in Bolzano Italy, avidly studied by archeologists. Ôtzi's body is so well-preserved that his ample last meal has been identified as einkorn and ibex. He suffered from whipworm (an intestinal parasite), and, interestingly, from a form of Lyme disease. Analysis of his bones show that his lifestyle included long walks over hilly terrain. He was a hiker.

His gear is also well-preserved. It reveals much about knowledge of wood and other forest products at the dawn of the Copper Age, as well as the timelessness of a hiker's needs.

One essential item of a hiker's gear is a knife. Ôtzi carried a dagger with flint blade still mounted deep in its ash wood handle, held in place by animal sinew. It is in a scabbard made of tree bast (fiber) mesh stitched together with grass, which attached to his belt by a leather eyelet. He also carried a *retoucheur*, a sharpening tool for flint blades, made from linden wood and fire-hardened antler.

His most notable possession was an axe with copper head, copper being the only metal that people had learned how to smelt at that time. The head was held by birch tar deeply in the forked shaft of a carefully smoothed yew haft tightly bound with thin leather straps. Archaeologists reproduced the axe and find that it can fell a yew tree in 35 minutes without sharpening. Ôtzi's axe shows clear signs of use for chopping and cutting.

Nearby was a yew bow stave and a quiver containing fourteen arrows. Oddly, the bow stave was not finished and had not been strung, and all but two of the arrows were unfinished, too. The chamois hide quiver was supported along one side by a hazel wood rod. The arrow shafts were made of vi-

burnum sapwood. The two finished arrows, both broken, had flint arrowheads attached to the shaft with birch tar and thin nettle thread. The other ends showed evidence of fletching, or attachment of feathers, again by birch tar and thread. One of the finished arrows had a dogwood insert to extend its length. It was too long to fit in the quiver, and would have been too long for Ôtzi to use. Technical archeologist Harm Paulsen says that the two arrows could not have been fashioned by the same person (one crafter was left-handed)—another mystery.

A six foot long U-shaped rod of hazel wood, and two narrow larch wood boards with notched ends originally bound together by grass string, are believed to have been the frame for a hide backpack. However, the only remnants of the sack are nearby clumps of hair and hide.

Another basic item of hiking gear is a fire starter. Ôtzi wore a leather belt pouch filled with tinder fungus (*Fomes fomentarius*). Tinder fungus shreds into fluffy, easily combustible fibers, which can be ignited with sparks made by striking iron pyrite nodules against flint. In the pouch's tinder fungus there are traces of iron pyrite.

He carried two light, tough birch bark containers; cylindrical pots with oval bottoms and 8 inch tall rectangles of bark for walls. These parts were stitched together with tree bast through holes punched along the edges. One of the pots was blackened and contained charred fresh leaves and traces of charcoal. Archeologists surmise that live coals were carried in it, insulated by the leaves, for starting a quick fire.

He even had a minimal first aid kit, consisting of two chunks of dried birch polypore mushrooms strung onto hide strips attached to his clothing. Birch polypores are used for several medicinal purposes. Among other uses, they are styptic, antimicrobial, and effective against whipworm.

Much more could be said about Ôtzi's gear. I have focused here on the tree-based products. Not surprisingly, our Copper Age ancestors show excellent understanding of these materials. Ash, used for Ôtzi's dagger handle, is still used for handles today. It holds its shape well, and stays smooth

under constant rubbing. Yew, used for his axe handle and bow stave, is the hardest of all soft woods, both strong and dense. At the same time, it is extremely flexible and can be polished to a glossy finish. Medieval English longbows were made of yew, and it would still be the preferred material for wood bows if it weren't so expensive and hard to find.

Viburnum, from which the arrows are made, is a shrub commonly called Guelder rose. It is grown today as an ornamental. Modern wooden arrows are generally made from some type of tree wood, turned on a lathe. However, the Primitive Archer website (<https://primitivearcher.com>) describes how to make arrows from "naturally tubular" materials such as viburnum canes. Incidentally, another type of bush recommended in this article for arrow making is the invasive multiflora rose.

Hazel wood, used in Ôtzi's quiver and backpack, is also a bush. Its flexibility and ability to be shaped into a bow are obvious reasons it was chosen. The two connecting pieces for the backpack are made of hard, durable larch.

Tree bast, used in Ôtzi's dagger scabbard, the birch containers, and a net he carried for catching

rabbits, was made from the phloem of certain trees, the linden tree being one. To make tree bast, the soft parts of the inner bark are removed by microbial action, leaving tough, flexible fibers, which are made into string. Ôtzi had a six-foot coil of tree bast in his quiver. Birch tar, made by heating birch bark and collecting the birch oil that drips from it, is an all-purpose sticky putty. Solid at 65 degrees F, it becomes increasingly malleable with heat and can be used to hold a variety of things together. Judging from pieces of birch tar dating as far back as 11,000 years ago found with human teeth marks in them, it is likely that the usual way to soften it up was by chewing it.

Like seasoned hikers today, Ôtzi carried what he needed to survive and be self-reliant away from home for long periods of time. He had the means to hunt and prepare game, to collect materials for fabricating tools, a fire-starting kit, and plenty of materials for repairing things that broke, and he carried this gear in several cleverly constructed containers. His gear reveals his ingenuity and understanding of the forest materials around him. Through this rare, intimate glimpse into the life of a man who lived five thousand years ago we see that the details of living have changed, but the fundamentals remain the same.

Woodland Secret No. 22 — A Plant, a Plant! My Kingdom for a Plant!

By Arthur H. Westing, WRWA Trustee

All of the world's living things were long considered to fall into one of two large kingdoms, with each of those many, many organisms considered to be either an "animal" or a "plant." But fundamental differences among various members within these two traditional groupings ultimately led to the recognition of a rather larger number of distinct kingdoms. Those living things pulled out of the traditional plant kingdom — and thence to be elevated to being kingdoms in their own right — have been the fungi, the bacteria, the cyanobacteria, and the several groups of non-green algae. Some authorities have additionally pulled out the green algae, a decision also adopted for convenience here. Thus, what follows in somewhat simplified form is applicable only to those 400-thousand or so of the living things now considered to fall into this more restricted modern notion of the Plant Kingdom, but with emphasis on those several thousand growing in this region.

First the lower plants: This primitive group of plants does not produce seeds (not having learned how to make either cones or flowers) and its members reproduce largely via asexual spores. Neither does this group know how to make a plumbing (conducting or vascular) system, thereby greatly limiting the height its members can achieve. The oldest (most primitive) of the lower plants around here today — having lived on earth for the past 460-million years or so (since the Ordovician Period) — are the liverworts. Moving up the evolutionary ladder, next came the mosses. These were then followed by the confusingly named club-mosses (lycophods). The club-mosses still reproduce via spores, but they were finally ambitious enough to evolve at least a primitive conducting system. Then, arriving not much later in this evolutionary progression, came the ferns (rather closely related to the club-mosses). The ferns, the highest of the lower plants, also still

reproduce via spores, but they developed a more efficient conducting system, permitting them to grow considerably taller than their forebears (the liverworts, mosses, and club-mosses).

Now for the higher plants: The gymnosperms finally arrived on the scene about 320-million years ago (during the Carboniferous Period) — now locally represented by the conifers. The gymnosperms reproduce via seeds produced in cones. Our conifers are often referred to (only more or less correctly) as “softwoods” or else as “evergreens.” All of them are woody, being either shrubs or trees, with a number of the latter growing to impressively great heights. The conifers are all perennials, living for many years — indeed, in some cases out West for truly thousands of them. Next came the angiosperms, the first group of plants to produce their seeds within flowers, hence all being known as flowering plants. The first angiosperms to evolve were the dicotyledons (often shortened to “dicots”). Many of our dicots are herbaceous (non-woody), whether annuals, biennials, or perennials, and being either herbs (*sensu lato*) or vines. The rest of the dicots are woody, taking the form of shrubs or lianas or trees. These dicotyledonous trees are often referred to (again only

more or less correctly) as “hardwoods” or else as “deciduous trees.” Then at last along came the more advanced angiosperms known as monocotyledons (often shortened to “monocots”), some of them woody (these growing in warmer regions), but around here essentially all being non-woody (herbaceous). Our monocots include the orchids, grasses, sedges, and rushes.

Finally, it would be useful to mention that the Swedish over-achiever, Carl Linné (1707–1778), among other things took it upon himself to name (that is, re-name) all of the many hundreds of plants by then identified, doing so in a system of his own making that remains in use to this day. He gave every one of these a double name in Latin. Its first part — known as the genus (plural, genera; adjective, generic) — was applied to a group of more or less similar plants; and its second part — known as the species (plural, species; adjective, specific) — was assigned to each very similar (and sexually compatible) plant within that generic group. To demonstrate, for all of the oaks *Quercus* became the generic name; and, by way of one example, for White oak, its full name became *Quercus alba*.

Your Own Book of Secrets! — A compilation of all 26 “Woodland Secrets” (many of which first appeared on these pages), together with a bonus of three “Woodland Exhortations,” are available gratis to members of WRWA for their personal use in electronic (pdf) format (contact: westing@sover.net). A set in booklet form is available at nominal cost.

Harvard Forest Visit, April 23, 2016

by Margaret MacDonald and Bob DeSiervo

On Saturday, April 23rd, eight WRWA members and friends had an opportunity to view the stunning dioramas at the Harvard Forest’s Fisher Museum in Petersham, Massachusetts, and then to visit selected sites in the forest. Our guide, Audrey Barker Plotkin, a site and research manager, began by reminding us that the Harvard Forest studies forest biology, conservation, land use history, and the effects of environmental change on forest ecology; it does not conduct experiments in forest management. She then showed us an introductory video on the history of the forest since Harvard University purchased the first parcels of land in 1907 (Harvard has since expanded its holdings to 3,750 acres). At that time, Harvard intended the forest to serve primarily as a research center in

forestry and related disciplines, including soils, wildlife biology, geography and botany. Because white pine was a valuable species at the time, the university planned to fund its research programs through timber sales from sustainable annual harvests of old growth white pine. However, the hurricane of 1938 destroyed 70 percent of the timber in the forest; furthermore, the university had not taken fluctuating timber market prices into account.

The paper records maintained by the Harvard Forest represent the longest continuous history of any major forest in the United States. In 1988, the National Science Foundation (NSF) designated the forest as a Long-Term Ecological Research site

and since then has provided funds for integrated studies of forest dynamics. Since 2011, the Harvard Forest has also been the Northeast Core site for the National Ecological Observatory Network.

Given that until very recently scientists had no historical data on atmospheric conditions, researchers are reconstructing changes since glaciation and using that information to create hypotheses about possible conditions in the future. For example, they examine changes in the timing of events such as bud-out, leaf-out, etc. To gather the data, the researchers have installed webcams in the woods to look at the canopy, and also use satellite imaging. The data show that spring now arrives about four days earlier than it did in 1990; the researchers have less data on whether autumn occurs later nowadays than it used to.

Exquisite Dioramas

The exquisitely detailed dioramas, created by Guernsey and Pitman Studios, illustrate the persistent effects of land use history on the forest. The first seven dioramas depict the Landscape History of Central New England, showing the same location at intervals from 1700 (the pre-settlement forest) to 1930 (the “modern” forest landscape – albeit before the 1938 hurricane). The dioramas in between show conditions in 1740, when settlers cleared the land for subsistence farming, with 75 percent of the land used for pasture; 1830, when forest clearing and agriculture reached their height; 1850, when people began to abandon their farms and trees (primarily white pine) rapidly took over the former pastureland; 1910, when the pines had grown into a respectable-sized forest; and 1915, when the pines gave way to hardwoods, mostly gray birch, red maple, and red oak, of which the latter two were dominant. By 1930 vigorous growth of hardwoods had replaced the previously dominant white pines.

A second series of dioramas depicts Conservation Issues in the History of New England Forests, beginning with an old-growth stand at Harvard Pond and then showing alterations in wildlife habitat, the soil erosion that resulted from increased land clearing for agriculture, and forest fire management over the years. A third series illustrates Forest Management in Central New England. The dioramas depict such practices as plantation forestry (which was widespread in the early 1900s but dropped by the 1930s because it was too difficult and natural regeneration was occurring anyway),

thinning of hardwood stands to favor white pine, improvement cutting to remove wolf trees and promote growth of surrounding trees, pruning of crop trees, and group selection for shelterwood.

Ongoing Research

After we had admired the dioramas, Audrey led us on a short hike to a site studying forest succession where all trees of over two inches in diameter at breast height (dbh) are mapped. Each tree was first measured in 1969; subsequent measurements took place in 1975, 1991, 2001, and 2011, and the next measurement is scheduled for 2019. Signs on the trees record their history. As an example of how different species respond to the same conditions, Audrey pointed out an oak and a maple in proximity to each other, and noted that the oak had grown 12 cm in diameter since 1969, whereas the maple had only grown 6 cm.

During our walk, Audrey also outlined the research taking place at different sites. For instance, she manages a 7-acre permanent ecological research site studying forest regeneration since the 1938 hurricane. Another project centers on how forest biomass develops over time; the researchers weighing cut trees of different ages to determine the relationship between their weight and their biomass (of which about 50% is carbon). Another site studies the mycorrhizal association between pines and hardwoods.

On one 8-acre site the forest conducted a clearcut of white pine in late winter 2007/spring 2008, cutting all stems back to one inch. This was done to create young forest for study, regenerate native forest by removing the results of plantations, and provide early successional wildlife habitat (but the researchers will not keep cutting the forest back to maintain those conditions). Observations to date show mainly hardwoods coming back.

Selected plots in the middle of another site are fenced off to exclude deer and moose. Interestingly, if the fencing leaves a foot between the ground and the fence, deer can still get into the (partially) enclosed areas; moose cannot. Both video cameras and pellet counts are used to establish the number and types of animals in the study areas. The study seeks to compare the effects of browsing on forest regeneration in the protected and unprotected areas and to reveal which species browsers prefer and which are most resistant or susceptible. Results

already show that pin cherry will bloom only in the fully enclosed areas.

In response to questions, Audrey noted that the forest does not contain many ash trees, and therefore does not expect much effect from the emerald ash borer, but had to remove many hemlocks as a result of infestation by the hemlock woolly adelgid. Black birch is now taking over many of the previous hemlock stands. As for wildlife, the deer population is currently at a sustainable level and moose, bobcat, and beaver are coming in. Most of the forest is open for hunting.

After a picnic lunch outside the museum, we viewed a research site divided into paired 6 x 6 meter plots. Underground pipes heat the soil of one plot to a temperature 5° C above the ambient soil temperature, while its partner site acts as the control. The study focuses on soil processes and smaller vegetation; sites studying the effects on tree growth are necessarily larger (30 x 30 meters). The researchers observe the effects on the vegetation in the plots, measure the carbon dioxide coming out of the soil, and compare the findings from

the paired plots. So far they have not determined the underlying cause of the differences: whether microbes acclimate to the higher temperatures or the heat promotes the growth of more bacteria and fungi. Moreover, there are different types of carbon, and vegetation does not digest all types in the same way.

Then the more hardy and non-vertigo-challenged members of the group (N.B.: Bob was one of them; Margaret was not!) climbed to the top of an observation tower. The view was interesting, though limited to the surrounding canopy, and we could see that the oak buds were popping. The view was interesting, but because the tower was not on a high point views were limited to nearby ridge lines. Other research towers performing carbon sequestration research were nearby.

More information about the forest is available at <http://harvardforest.fas.harvard.edu/> We all thank Audrey Barker Plotkin for treating us to such an interesting and informative tour.

Sugarhouse Tour, Robb Family Farm 2016

By Margaret MacDonald

Braving the deeply rutted roads characteristic of Vermont's mud season, 12 adults and one child showed up for the WRWA-sponsored tour of the Robb Family Farm sugarhouse in Brattleboro (more people joined later). After a welcome by Sam Schneski, Windham and Windsor Country Forester, Charlie Robb, Jr., then began the tour by taking us outside to show us the lines used to collect the sap, one of which extends about a mile up the hill behind the sugarhouse. The Robbs' operation went from 2,200 taps in 2015 to 3,500 this year; next year the Robbs plan to increase the number of taps to between 5,000 and 6,000. The Robbs run 17 inches of vacuum pressure in the lines on the same side of the road as the sugarhouse and 20 inches across the road (where they also collect sap using buckets).

Charlie noted that for a while the Robbs used a Clorox solution to flush the lines after the sugaring season ended, but stopped because squirrels like the taste of Clorox and were gnawing through the lines to get to this favorite beverage. (Author's

note: I never had much respect for squirrels; this lowers my opinion even further.) Now the Robbs just use water to flush out the lines.

Charlie explained that the Robb family has owned the property for 117 years. They closed their dairy business in 2011, and now sugaring is their main activity, with haying next; they also sell grass-fed beef. In addition to syrup, they make various types of maple candy (and any candy unsold when its freshness declines is simply tossed back into the boiler and becomes part of a new batch of syrup). Most of their sales occur through their on-site store and the Internet.

The current sugarhouse was built in February 1998. One clever feature is a set of tracks that runs from the attached woodshed up to the door of the wood-fired arch; it allows the Robbs to load the wood onto a cart in the (relatively cold) woodshed and then easily wheel the cart close to the door of the boiler and toss the logs into the wood-fired arch. This year the Robbs are burning largely

Hemlock that was cut when they were thinning around the maples; Charlie said that they had burned through 30 cords of wood so far. Despite the relatively warm winter, the Robbs expect to bring in 750 to 1,000 gallons of syrup this year. The sap was still running during our tour; as we could see, the sap entering the tanks had a slightly yellow tinge, and Charlie believed that the syrup produced that day would be “robust” in grade.

The boiler is equipped with a gauge that shows the temperature in the final boiler pan and also allows the Robbs to set the temperature at which the boiler should automatically open the valves to draw off syrup. The temperature when they can draw off varies with barometric pressure, so it is different every day. As the sap in the last pan reaches a likely temperature, the Robbs draw off small samples and use a hygrometer to measure the sugar content. When the sap enters the first pan of the arch its sugar content is approximately one percent; the Robbs will begin to draw off syrup when the sugar content in the samples reaches six to eight percent. At that point they set the desired temperature; from then on the boiler will automatically open the

valves to draw off syrup when the two numbers match. Charlie commented that this automated process can keep them busy (and at times frantic) when the sap is running well. During the previous run the temperature had been set to 220°; after repeated sampling the Robbs set the gauge at 222°, and believed that it would take a while before the sap reached the desired sugar content.

When the sap is running well, the Robbs can empty their 600-gallon sap tank three or four times a day, draw off raw syrup every 10 to 20 minutes, run it through the filter press, and produce 6 to 10 gallons of syrup an hour. The Robbs put the syrup into containers right there in the sugarhouse. They also capture the water condensed from the steam produced by the boiler and use it to clean the filter press.

We did not stay to see the first draw of syrup, but most of us did load up on syrup, candy, and other maple products at the store next to the sugarhouse. Many thanks to the Robb family for hosting us on this enjoyable and informative tour!

Basswood Use

By Marli Rabinowitz, President, WRWA

It has come up a couple of times during distracted moments of trustee meetings that basswood bark can make a good rope. So I thought I would write a little bit about that.

Basswood (*Tilia americana*) is a beautiful native tree in our region. It is tall and straight growing, with heart shaped leaves and white, nicely scented flowers. Its presence is an indicator of rich, moist hardwood forest soil. Its lightweight, pale wood is used for carving decoys, boxes, and some furniture. Its flowers are great for pollinators and make good honey and perfume. They can be used for tea, and the young leaves can be eaten as greens.

The name basswood is from bast wood. Not in honor of the cat goddess Bast, but in reference to the use of the inner bark to make bast, or fiber. To make bast, the bark is stripped from the tree and the inner bark is separated from the outer bark. This is easiest in the spring when the sap is flowing. The fibers of the inner bark are then soaked for a few days to a few weeks. Adding some lye or leachate from wood ashes hastens the softening of

the fibers. After this they are pounded and rinsed, and the loose fibers can be spun into rope, thread, or even pressed into paper.

However, I have often made very serviceable cordage straight from the tree. If you cut a small branch, you can peel the bark off in one long strip, which is what makes basswood so good — these long straight fibers (actually phloem support cells). Peeling the inner from the outer bark leaves long flexible strips that can be divided into narrower ones. To make cordage, twist one strip until it kinks and winds around itself. Then continue to twist each strand and cross one over the other in the direction it goes naturally. Twist, twist, cross; twist, twist, cross. Add more strips in as you go to make it any length. You can make it as thin as string as it is very strong, or thicker for a bigger rope. It is handy in the garden to tie up plants, or for basketry, camping, or any other rope use.

This might not be a big profit maker, but it will give you a good skill and a tiny sense of independence to use what grows right around us.

Windham Regional Woodlands Association
130 Austine Drive, Suite 300
Brattleboro, VT 05301-7040

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Upcoming Programs

(See inside for details)

Thursday, June 23 from 5:00 to 7:00	Cersosimo Lumber Company Evening Sawmill Tour
Thursday– Saturday, July 28–30	<i>Maplerama 2016!</i> Grand Summit Resort, Mt. Snow, W. Dover
Saturday, September 24	WRWA Annual Meeting, Green Mountain Camp, Dummerston

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.