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March/April 2021

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In Appreciation...

We thank the UW Center for Cooperatives for their ongoing support

Thank you for support to Northwoods Alliance Inc. Land Conservation Initiative, which includes a generous grant from an anonymous UP donor, from Al, Rick and Bike Packing Roots as well as several more individuals.

Governor's task force issues Climate Change report Forestry identified as one of nine “policy sectors”

By Charlie Mitchell
March 15, 2021

Since taking office in 2019, Governor Evers has committed to taking action on the effects of climate change in Wisconsin. The Governor's Task Force on Climate Change, created in October 2019 with Lieutenant Mandela Barnes as chairman, has recently distributed their Climate Change Report dated December, 2020, with recommendations of actions to “meaningfully mitigate” the negative effects of climate change “for the benefit of Wisconsin communities”.

The 115-page Report cites how the 1 degree Centigrade (2 degrees Fahrenheit) rise in temperature above the average temperature of the twentieth century is impacting Wisconsin: damage to property by severe storms, damage from flooding, crop failures due to drought and other adverse growing conditions, and elevated incidents of heat strokes and exhaustion.

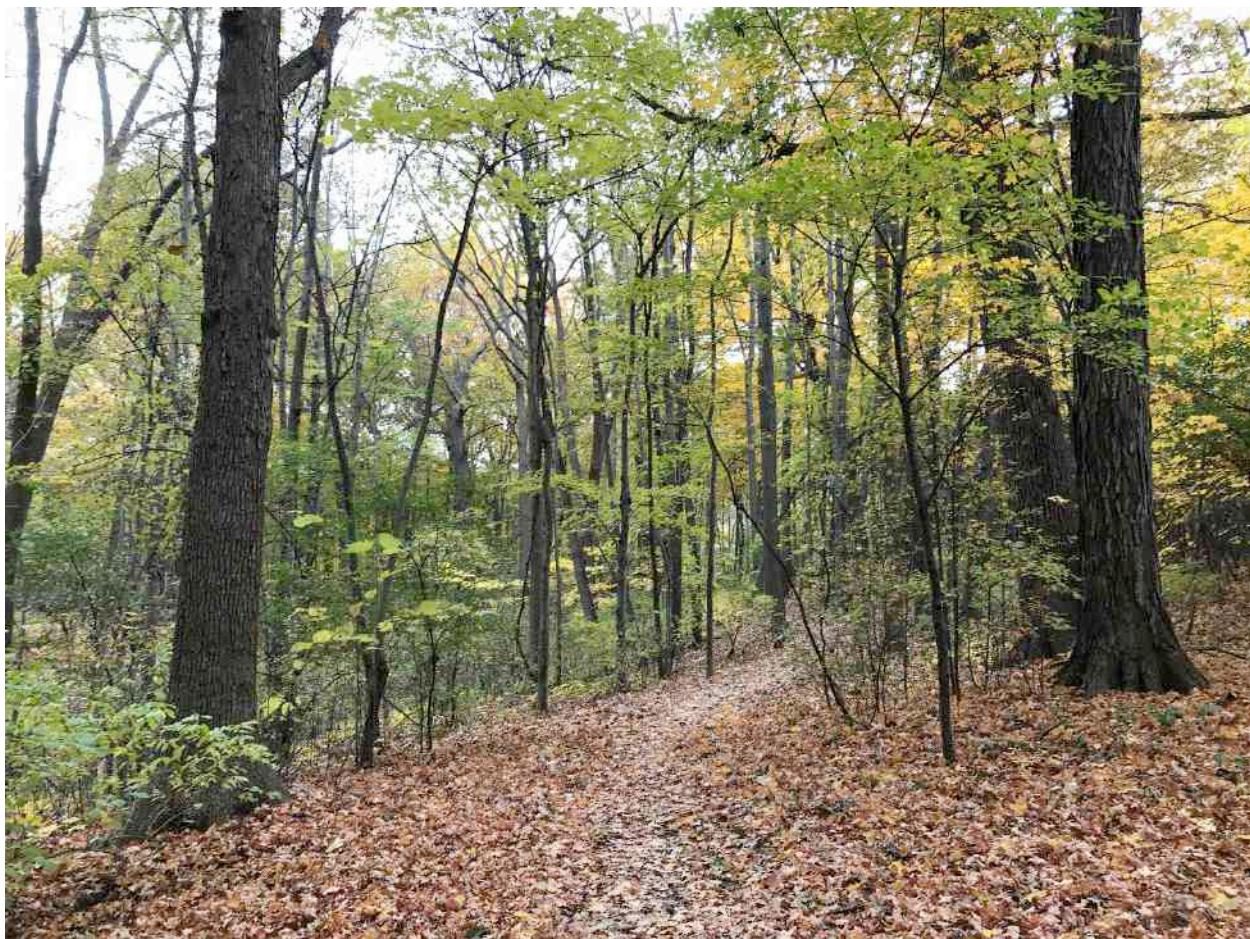
The Report states that 19 of the warmest years on record have occurred since 2001, and that even if the world meets its current greenhouse gas reduction commitments under the Paris Agreement, the globe is expected to warm 3 degrees C by 2100. The increased heat is expected to threaten Wisconsin's cold-water fisheries, affect the health of native trees and plants, cause the proliferation of pests and infectious diseases, and cause the destruction of beaches and marinas by storm surges.

The Report presents statistics recently published by the Wisconsin Department of Natural Resources on greenhouse gas emissions. In 2017, the electric power sector produced 33% of the emissions, transportation 24%, agriculture 15%, and industrial 11%. Carbon dioxide accounted for 81% of greenhouse gas emissions and methane 10%. Emissions have declined in Wisconsin by 9% between 2005 and 2017, mostly due to reductions in the electric sector.

Nine policy sectors are identified and the Report describes recommended “climate solutions” for each of the sectors. The sectors are Climate Justice, Energy, Transportation, Agriculture, Resilient Systems, Economy, Education, Food, and Forestry. Most of these sectors produce greenhouse emissions. Forestry is

the only sector that absorbs emissions. Tree leaves take on CO₂ in the life-sustaining process of photosynthesis. However, Wisconsin forests and natural lands lost over 25% of their carbon sequestering ability between 2005 and 2017 due to the encroachment of agriculture and the conversion of cropland to urban development.

In the Forestry Sector, there are five priorities listed for attention: forest conservation, reforestation in rural areas, tree planting in urban areas, climate-focused forest management, and support of wood-product utilization.



Sanctuary Woods in County Grounds Park, Wauwatosa

Photo by Charlie Mitchell

To accomplish conservation, also described as “keeping forests as forests”, some of the strategies recommended are: tax forested land on its value in its current use rather than its highest/best use, provide tax and other incentives to landowners who donate forested land or conservation easements, and explore the possibility of a family forest carbon credit program for small woodland owners.

All of these recommendations require some new state legislation and funding. There are no cost estimates because the Report did not go into that depth.

In the realm of reforestation, the main ideas are to implement a rural tree-planting campaign, fund private owner assistance for tree-planting, and purchase and reforest open lands that were formerly forested. Reforestation could “offset” an estimated 5 million tons of CO₂ per year.

Regarding tree-planting in urban areas, develop and implement a campaign to plant more shade trees, and provide assistance to communities that are interested in participating in carbon credit programs. Increased forest canopy in cities has the potential to sequester and store an additional 0.3 tons of carbon a year, plus provide additional benefits such as reducing temperatures in the city, reducing storm-water runoff, and increasing air quality. The presence of trees in a city also reduces crime rates and increases property values, too. Trees reduce energy demands because they provide cooling by the shade that they give and by transpiration of water vapor.

To implement climate-focused forest management, define carbon as a forest product through state policy, provide funding sources for planting understories in forest stands that are not fully filled in, and establish funding to purchase land and maintain it as a working forest.

To support wood products utilization, develop a campaign on the benefits of using Wisconsin wood products, invest in research and commercialization of “mass-timber” and cross-laminated lumber, and incentivize the use of renewable fuels (woody biomass) for space heating, and industrial process heat. Wood is extremely effective for long-term carbon storage. Buildings made from wood can store carbon that otherwise would return to the atmosphere when trees die and decompose on the forest floor.

Of course, expanding and nurturing our forests has the well-known additional benefits of an increase in beautiful scenery and fresh air, and the enjoyment of it.

For more information and to see the complete report, go to www.climatechange.wi.gov

PIF note: WE seek out and appreciate stories on important topics such as this from Charlie, who is a long time PIF asset. Let us hear what you have to say.

As a service to PIF members, contact Joe for special pricing in your needs for:

- Napoleon wood stoves**
- wood finishes and preservatives**
- garden and tree amendments**
- grass seed for trails**

Upper Midwest Forest Ecology Primer

By John Schwarzmann

Trees or Communities? Forests in the Upper Midwest and elsewhere aren't simply a haphazard collection of trees, instead, they consist of identifiable communities of plants and animals that form a shifting mosaic over the landscape. Depending upon whether one is a lumper or splitter, about 15-20 forest communities, each with its prominent species, create a diverse assemblage of forest types.

Three main environmental factors; nutrient levels, moisture and frequency of disturbance create a three-dimensional spectrum to which each forest community is adapted to a specific range among the spectrum of possible combinations. For example, northern white cedar swamps exist in areas with abundant moisture and nutrients and infrequent disturbance. On the other end of the forest spectrum lie jack pine woods. This forest type is well adapted to low moisture and nutrient levels and frequent disturbance.

As you move about the landscape, you will notice the following common forest communities.

What is a disturbance? *Any event that removes trees from the forest canopy. Wind storms, insect attacks and fire are the main natural disturbances in the Upper Midwest but flooding, drought and diseases also take their toll. Logging has replaced wind and fire as the most frequent disturbance in the vast majority of forests in the Upper Midwest that are managed for timber production.* **Disturbance Frequency** – How often trees are removed and the intensity of the disturbance determines how old and large trees can grow to before they make way for another generation. Typically, disturbance intensity (proportion of canopy removed) and frequency are inversely related. Frequent disturbances like moderate windstorms remove scattered trees, creating small gaps in the canopy. These occur several times per decade on any given acre of land. Higher winds that knock down 30 to 60% of the canopy occur about once every 300 years or once in the lifetime of a big, dominant sugar maple or hemlock and finally, catastrophic disturbances that completely destroy the canopy like a tornado or crown fire occur about once every 600-900 years in the Upper Midwest hardwood and hemlock forests.

Northern Hardwoods – These forests are dominated by sugar maple, yellow birch, basswood, red maple, white ash, black cherry, with minor amounts of conifers such as Balsam fir, white spruce and Eastern Hemlock. These forests thrive on nutrient-rich sites, with moderate moisture and infrequent disturbances. These forests reach their greatest brilliance in autumn, adorning the landscape with hues of orange, crimson, purple and gold.

Hemlock Hardwoods – These forests are dominated by conifers such as Eastern hemlock, white spruce, white pine and the deciduous yellow birch. They occur on moderate nutrient and moisture levels with infrequent to moderately frequent disturbances. They often look very patchy with nearly pure groves of hemlock. Hemlocks can grow extremely slowly in deep shade for centuries waiting for neighboring tree(s) to die creating favorable growing conditions where they respond with a fast growth spurt to capture the coveted sunlight in the forest canopy. Mature hemlocks can get over 400 years old and when they die, decay very slowly, creating a great seedbed for hemlock and yellow birch seedlings.

White and Red Pine – Iconic for their beauty and stature, these forests were synonymous with European pre-settlement conditions although they occurred at most on 25% of the landscape on sites with medium to low nutrient levels and medium to low water levels. Little is known about their natural disturbances and how often fires raged through these forests. Almost none were saved from the ax, plow and subsequent fires of the 1870-1915 era followed by enormous fires that consumed the remaining branches from the cutover lands as well as seedling pines. Areas with more infrequent

disturbance had more white pine than the shorter-lived red pine. White pines can live to be 350 years old and never stop growing allowing them to reach giant sizes where they tower above the surrounding forests, sticking out above surrounding trees in a super-canopy position. These giants can sometimes reach 160 feet tall and 50- 65 inches in diameter. They are renowned for the importance as bald eagle nest sites and trees where baby black bears seek refuge from potential predators.

Cedar Swamps - Slow growing cedars live in depressions in the landscape with black ash where water pools and percolates slowly to the water table. These sites are very wet and nutrient rich and are infrequently disturbed allowing cedars to grow to very old ages, sometimes exceeding 600 years-old. Cedars have small crowns and can form very dense stands that offer refuge to deer in the winter from cold winds. Untouched cedar forests often harbor rare orchids and other rare plants.

Spruce/Fir – Also known or the “boreal mix” for trees that can withstand cold temperatures, this forest type is dominated by white spruce, Balsam fir, white birch and trembling aspen. It often grows in cold air drainages with the lowest temperatures on the landscape such as swamp margins and stream corridors. These forests are found on moderate nutrient sites with high to moderate soil moisture and frequent disturbance often in the form of insect outbreaks.

Tamarack/Spruce swamps – These forests grow on extremely nutrient poor sites with very wet conditions. Nutrients are sparse and the water levels are so close to the surface that decomposition of plant residue is slow and the soils are mostly made up of partially decomposed plant matter called peat. The dominant understory plant is sphagnum moss that forms carpets as thick as 10 feet deep that quake like a water bed when you try and walk over it. Tree growth is very slow. Often, black spruce trees only 3 to 4 inches in diameter can be 100 years old. Similar to forests in the far north of Siberia or Canada, tamarack-spruce forests give way to stunted spruce muskegs in the center of large wetlands where there aren't enough nutrients to sustain tree growth.

Aspen – These forests are adapted to intense fires that remove most of the trees in a forest. They are super common in the Upper Midwest and can often dominate the landscape, not because of fires, but due to the history of frequent clear-cut logging. Aspen seeds are very light and can float for miles on little parachutes seeking recent burns or clear-cuts that left exposed mineral soil. Aspens are also adapted to intense disturbances with their ability to send up thousands of shoots from their root system when the canopy aspen trees are cut or burn. Both trembling and big-toothed aspen exist as clones of genetically identical individuals sharing a common root system. These single organisms can spread over wide areas. The largest known lifeform on planet Earth is an aspen clone in the Rocky Mountains of Utah.

The forest community mosaic has Pleistocene (Ice age) geology to thank for rich variation in soils that directly influence the nutrient content, moisture capacity and disturbance regime of a given site. The back-and-forth movement of the glaciers and meltwater characteristics created diverse landforms and soils ranging from droughty, coarse outwash sands, to nutrient rich drumlins. These soils often change dramatically over short distances leading to the forest mosaic appearance.

While soil greatly influences the type of forest that grows upon it, forest communities aren't locked into place. Any given soil can support several different forest communities. The intensity and frequency of disturbances along with the soil determines the actual forest community that you would find in any given site. The displacement of one forest and the following regrowth is termed forest succession as one forest “succeeds” another.

Forest Succession – Transition from one forest to another generally occurs when forests reach a mature or old-growth condition as they are more prone to disturbance at that time. Viewed over decades and even centuries, succession creates a shifting mosaic of forest types over the landscape. Like forest communities, succession can be categorized into distinct classes. **Seedling/Sapling Stage** – If disturbance is intense and much or all of the canopy is removed, forest initiation will begin as a seedling/sapling dominated stand. Complete canopy removal favors the weedy tree species that can move seeds widely over the landscape like aspen or species that can store viable seeds in the ground for up to a century like black cherry. Partial canopy removal in the form of heavy logging or windthrow will favor seedlings that are already growing on-site and can, where shade tolerant enough, to survive the disturbance. These seedling stands are often much hotter than neighboring forests due to fewer leaves and as a result of the heat, experience faster decomposition with subsequent nutrient losses. The light and heat also attract weedy herb-layer species and provides little or no habitat for animals that require large trees for dens or nests. Small trees are usually more palatable for deer so they often support

very high deer numbers and suffer browsing damage to sensitive plant species.

As the seedlings grow, their crowns eventually touch and form a canopy when trees reach a diameter of 4 to 10 inches. This stage is called the **“pole” forest**. This stage is characterized by dense shade on the forest floor and poor wildlife habitat due to the lack of dead trees or snags (dead standing tree) that provide habitat for dozens of bird, mammal and amphibian species.

As pole stands grow older, they enter a period of stem exclusion where the taller trees shade out the smaller trees leading to enhanced mortality. A complex forest canopy begins to develop where a simple, even layer grows into undulating ridges and valleys of taller and shorter trees. Over time, the pole stand gives way to a mature forest with a mixture of both large trees well adapted to the site and smaller trees growing slowly under the shade of competing trees.

Mature Forests - When forests are comprised of long-lived species such as sugar maple, yellow birch and white pine, the mature stage can last for many decades. On the other hand, forests comprised of short-lived tree species such as Balsam fir, quaking aspen and jack pine may only spend one to several decades in the mature stage before heavy mortality leads to yet another successional cycle. Mature forests tend to experience little mortality to dominant canopy trees. Dead trees tend to be small, and suppressed, growing in the deep shade of competing trees.

Certain species like sugar maple and white pine do not slow-down in growth as they age, during the mature stage they can reach enormous sizes and super-canopy positions. For forest communities such as northern hardwoods, white and red pine and hemlock hardwoods with very long-lived species, trees will eventually start to decline from old-age resulting in much more tree mortality. This stage is called old-growth.

Old-growth Forests- These forests are characterized by a 50% or more proportion of big trees in the canopy (> 18 inches diameter) with numerous gaps caused by mortality of individual trees. Snags and dead wood on the forest floor is ample providing great wildlife habitat and germination sites for hemlock and yellow birch. Old-growth stores large amounts of carbon in both standing trees and dead and decaying wood. Addition of decaying wood adds fertility to the soil and forms humus, a black layer of decomposed organic matter and soils that is especially rich in nutrients and moisture holding capacity. Old-growth is said to be in a steady-state with respect to growth as mortality is approximately equal to tree growth. This stage can last for centuries without a heavy disturbance favoring the regeneration of trees that grow well in gaps such as Eastern hemlock, sugar maple and yellow birch. Prior to European settlement, about 80% of the northern hardwood and hemlock-hardwood forests were in the old-growth or mature forest stage. If carbon storage is ever taken seriously as a method to limit global warming, then forests will need to be allowed to grow to older ages since seedling/sapling stands lose carbon to the atmosphere contributing to CO₂ pollution and pole stands contain only a small fraction of the carbon compared to mature and old-growth forests.

Today's Upper Midwest forests differ dramatically from those 150 years ago before the pre-settlement era or half the lifetime of a sugar maple tree. Only 1-2% of the forest is in an old-growth condition with the vast majority of forests in the seedling/sapling and pole stages. Mature forests are more common in northern hardwoods where they are just starting to grow out of the pole stage. Most trees are cut down for forest products between 4 and 15 inches in diameter leading to a condition of perpetual starting over.

John is Vice President of Partners in Forestry Coop and Northwoods Alliance Inc. He has recently retired from Forest Supervisor for the Wisconsin Board of Commissioners of Public Lands.

A good story to help keep abreast of the tax code for woodland owners can be found at

<https://www.usda.gov/media/blog/2018/04/06/helping-forestland-owners-navigate-tax-code>

O KUN-DEE-KUN FALLS AND STURGEON GORGE WILDERNESS ON THE NORTH COUNTRY TRAIL

Beautiful O Kun-dee-kun Falls, on the Baltimore River just prior to its merger with the Middle Branch Ontonagon, is accessible by the North Country National Scenic Trail (NCT) of the National Park Service. The NCT begins in Vermont at a break with the Appalachian Trail, goes through the Adirondacks and western New York, Pennsylvania, Ohio, Michigan, Wisconsin (north tip), Minnesota and terminates in North Dakota on the west. While some parts of the trail include road hiking, UP and Minnesota offer long uninterrupted trail hiking near waterways and hills. On the Ottawa National Forest the trail is 116 miles long. On the far east of the Ottawa, it traverses the McCormick Wilderness, and heading westerly it goes to the Sturgeon Gorge, continues to O Kun-dee-kun and on, overlooking Victoria, and to the Norwich mound, the Trap Hills, skirts the Porkies on the south and over to the fabulous waterfalls on the Black River near Copper Peak. Being so far north, the trail misses much of the early spring long trekkers who begin south on the Appalachian Trail and head north. Reportedly only 20 people have yet hiked the iteration of the NCT.

In this region, the trail is accessible from many roads, including US Highway 45 north of Bruce Crossing, where one can hike to this Okun dee kun. <https://www.nps.gov/noco/planyourvisit/upload/brochure-map-1.pdf>

Wild land enthusiasts will be pleased to hear word of a proposal inspired by the Environmental Law and Policy Center to increase wilderness areas on the Ottawa. These rugged areas would accent the trail experience. Included is a 2000 acre addition to the Sturgeon protecting a large wetland used by moose, the

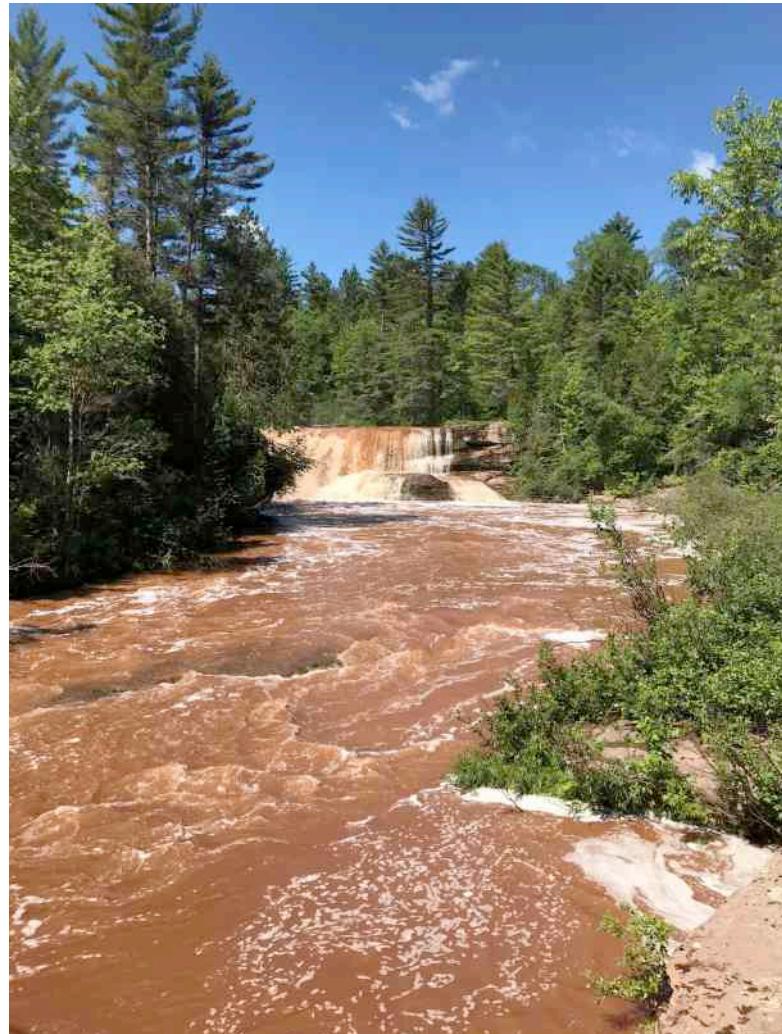
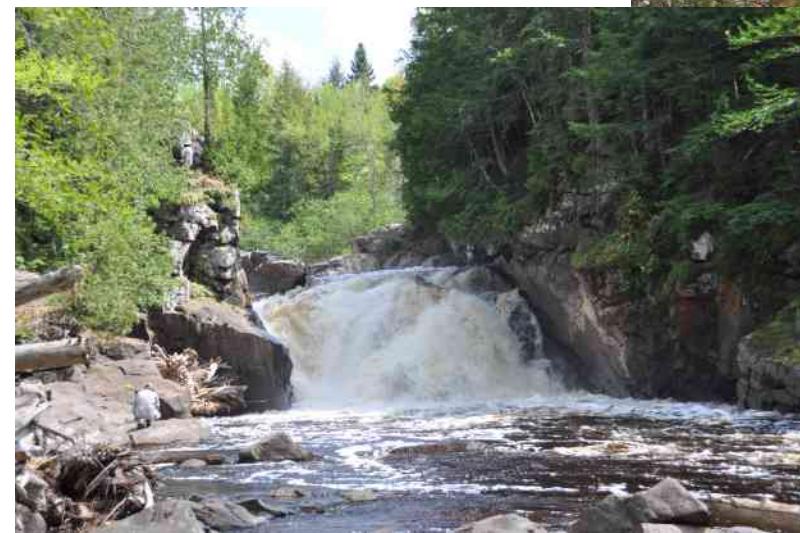


Photo: Tammy Tschida

Ehlco area just south of the porkies, and perhaps the prize would be a Trap Hills Wilderness, encompassing the tallest sheer cliff in Michigan, at 350 feet. Seems like a sensible proposal, protecting wild areas that are primarily not good timber land. Get out and enjoy the splendor of nature this year, and experience the vast importance of our public lands.



**THE BOOK
CORNER**

Review by:

Rod Sharka

“Walking Home Ground: In the Footsteps of Muir, Leopold, and Derleth.”

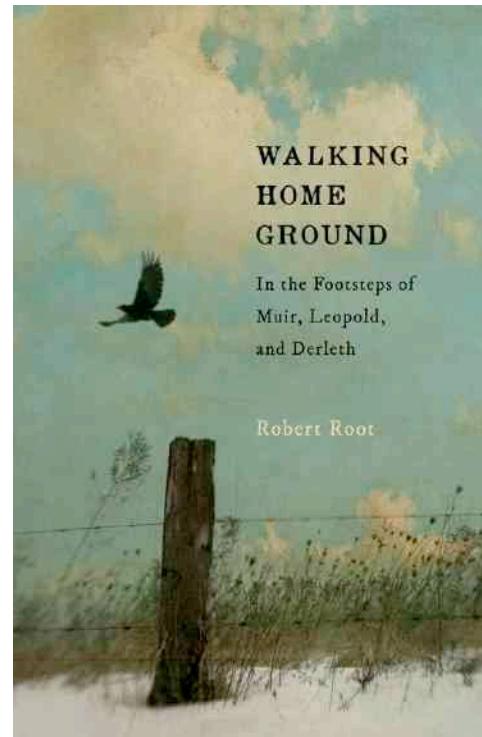
by Robert Root (2017)

Long time author Robert Root always considered himself a “Great Lakes boy”. He spent his youth in western New York near Lake Ontario, then spent nearly three decades in central Michigan where he met his wife, Sue. After leaving Michigan to spend four years in Colorado. Feeling lost and out of place, he and Sue moved back to the Great Lakes area and settled in Waukesha, WI to be closer to family and back on home turf (close to the Great Lakes) where he felt more at home.

To get to know his new home and develop a stronger sense of place, Root decides to walk the same terrain traveled by three Wisconsin luminaries who were deeply rooted in place...John Muir, Aldo Leopold, and August Derleth. Root walks with Muir at John Muir State Natural Area, with Leopold at the Shack, and with Derleth in Sac Prairie where he spent his entire life. Closer to home, he traverses the section of the Ice Age Trail that runs through Waukesha County, often reflecting on such historic individuals as pioneering scientist Increase Lapham. Along the way, Root reflects upon the changes to the natural landscape over nearly two centuries as he chronicles his own transition from someone on unfamiliar terrain to someone secure on his home ground.

In prose that is sometimes introspective and other times haunting, *Walking Home Ground* inspires us to see history's echo all around us: the parking lot that once was forest, the city that once was glacier. “Perhaps this book is an invitation to walk home ground,” Root tells us. “Perhaps, too, it's a time capsule, a message in a bottle from someone given to looking over his shoulder even as he tries to examine the ground beneath his feet.”

Although in my opinion this book would have benefitted from having a few more photos, and especially some maps to better locate the areas Root was describing (of which there were none), I found this book to be an enjoyable and thought provoking read.





Also, the DNR has come out with a new oak wilt brochure. The bad news is it now seems to be widespread in Vilas County.

https://widhr.widen.net/view/pdf/suhpixjqyx/Oak-Wilt-Factsheet?t.download=true&x.share=true&x.portal_shortcode_generated=84nd650p&x.app=portals

PIF asked John Krause to offer further comments in a story previously published in the Price County Review

Are There Too Many Deer in Price (and other) County?

Property owner, forester sees regeneration problems

By Anna Maria Hansen additional text provided by John Krause [in brackets] which did not appear in the original article

For Price County resident John Krause, the impacts of deer-related browse damage strike close to home on his property, located off county Highway K in the Town of [Hackett].

Krause has owned and lived on the small piece of land for about 20 years and has seen firsthand the effects of excessive deer browse on his property, which includes his house [with numerous native plant beds], a sizable garden, orchard, and a woodlot.

Over the past two decades, Krause – a [part-time] forester himself, employed by the Board of Commissioners of Public Lands – has worked to transform the 10.84-acre property, planting [and naturally regenerating] hundreds of trees over the years. Featured species, [which are regionally declining in part due to unsustainable deer browse], include hemlock, cedar, yellow birch, white pine, oak, and [basswood], among others.

[Some native tree species, such as ash, cherry, and ironwood, Krause has noticed are not preferred by deer and have become increasingly dominant in his forest's understory along with the exotic shrubs honeysuckle and buckthorn which are a constant management challenge to keep under control. By preferentially browsing certain species while leaving others alone, deer give certain woody and herbaceous plants a significant competitive advantage, thereby changing the composition of the forest over time.]

As a trained forester, [and a persistent property owner], Krause has spent the better part of two decades using special techniques to protect the trees, shrubs, and native plants on his property he doesn't want browsed by deer. Whether it's applying deer repellents [on long-lived conifers], placing protective caps on the [terminal buds of sapling white pine], or fencing in conifer and hardwood trees and shrubs during their most vulnerable [establishment] stages, Krause has spent hundreds of hours and considerable money in order to reestablish a diverse forest on his property.

"it shouldn't be this hard," Krause said, pointing out a young oak tree that was left uncaged, compared to one that was protected from deer browse by heavy wire fencing. The fenced sapling has grown tall, with branches reaching for the light. The exposed oak is half the size, it's branches knobby and scarred from repeated browsing. [Krause feels that current browse pressure in most of the county precludes most like-minded landowners from undertaking similar forest restoration efforts at any sort of meaningful scale].

Krause saw the worst browse damage in the early 2000's when he first moved to the property, and the least between 2013-14 – which mirrors changes in the deer population estimates calculated by the Wisconsin Department of Natural Resources for those years. In 2014, the Price County deer herd was at a low estimate of 16,500 animals compared to the estimate of 33,600 in 2007.

With the majority of indicators [including impacts to forestry, agriculture, and transportation] pointing toward the deer herd having increased over the past several years, Krause says he is once again seeing significant browse damage to young trees on his property, along with his garden [and orchards].



John Krause demonstrates his protection of young trees from over browsing by deer

This observation made by Krause on his small tract of private land mirrors the findings of a recent [forest regeneration] report published by the DNR, which found that in the past three years 57% of stands surveyed for the study were failing to regenerate at the ideal pace.

Located near agricultural property in the southern half of the county, Krause is located where the numbers of deer on the landscape are likely higher than they are in the more densely forested sections in northern Price County.

While Krause may be eligible to receive damage permits to harvest some of the deer on his property, he said he is hesitant to enroll in the deer

damage program because it would require he open his small private property to public hunting. Additionally, due to the size of the property, the number of tags issued would likely be quite small.

As a gardener and a [small woodland owner], Krause said he doesn't see his interests reflected on the county's deer advisory council, which helps determine the deer population trends and the antlerless quota each year. Krause would "like to see someone who represents interests like his on the council". "I don't own this property to do production forestry, I want to manage it [for some firewood], for wildlife diversity, [low impact] recreation, aesthetics, gardening – all equally important. And right now, I don't see that viewpoint represented."

[Krause feels that most CDAC's (including in Price County) are (with a few notable exceptions) dominated by "deer centric" individuals who are largely "deer advocates" rather than representing their seat, the resource base, and the various user groups who are negatively affected by high deer populations. He is also frustrated by what he perceives as a lack of "pushback" by local DNR forestry and wildlife staff to CDAC's recommendation to yet again increase the deer herd for the next three years.]

[Because of this, Krause's strong preference is for WDNR to ultimately restore the old deer management framework (pre 2014) which was a quantitative, objective, science based system rather than the current qualitative, subjective, and opinion-based CDAC process currently in place.]

While Krause claims there are other property owners facing similar issue with the number of deer in the county, these individuals comprise the smallest group providing feedback to the deer advisory committee and the DNR when public comment is accepted on the deer herd each year.

This year, public comment will be accepted between April 12-25 as the Price County Deer Advisory Council deliberates the appropriate number of antlerless deer tags to be issued for this year's hunt.

A hunter himself, Krause said he would like to see the CDAC manage the deer herd for quality over quantity. [He believes a smaller, more sustainable sized deer herd created through more aggressive antlerless harvests over time would result in an increase in overall deer size, a higher percentage of antlered deer, and more mature bucks in the population which would be supported by other hunters like himself interested in quality deer management.]

"I'm not anti-deer, I harvest venison every year," Krause said. "But we need to get sustainable numbers in our deer herd – numbers which allow our native species to regenerate without having to put a cage on everything."



THE ROOT OF THE PROBLEM

Paul Hetzler

The love of money may be the root of all evil, as the Bible maintains, but where trees are concerned, a heck of a lot of evil is due to root damage. This problem (root damage, not the love of money) is often considered an urban-forestry issue, and with good reason – it's the ultimate cause of the vast majority of tree decline and mortality in landscape and urban settings. However, it's also a legitimate forestry concern, one which is escalating.

Forest owners and managers who are interested in multi-generational forest health would do well to consider root damage when planning harvests, and really any time a machine heads into the woods. Because maple producers may have equipment in a sugar bush for thinning, culling, or sap collection operations on an annual basis, they stand to benefit most from adopting practices that minimize root damage.

To briefly revisit some tree biology, about 90% of tree roots are in the top 10 inches of soil, and 98% reside in the upper 18 inches. Unless there are physical barriers such as waterways, skid roads or rock outcrops, roots will usually extend between two and three times the branch length. Foresters are aware that tree species like hickories, oaks, walnuts, and certain pines can have a substantial taproot. Even so, mature trees of all species here in the Northeast have root systems which are for the most part shallow and flat. It's no coincidence biologists often refer to these as root plates.

One of the reasons root damage has not been recognized as a forestry problem is that it can take 3-5 years for the first symptoms to show, and another decade for an affected tree to decline and die. Another thing which masks the effect of root injury is that when acute events like droughts and defoliations cause tree death, the slightly higher incidence of mortality among root-damaged trees is hard to notice unless one is looking for it.

In sugar bushes and small woodlots, equipment is usually of a modest scale, but even "light" tractors will cause lasting harm to the forest unless conditions are either very dry, or frozen. Roots get oxygen directly from soil pores, which form when healthy microbial communities create irregular clumps (aggregates) that lead to natural channels. Freeze-thaw cycles also help make soil pores. When these spaces get mashed shut, roots become far less efficient at absorbing water and nutrients. This bogs down the photosynthesis factory and reduces sugar production.

Moisture reduces the soil's shear strength, or ability to maintain its form under pressure, which is why harvesting in dry conditions is better for the woods. Depending on soil type (clay soils being more vulnerable to compaction) and moisture content, one pass with a tractor can crush or "puddle" the soil structure for years to come. Trees whose roots traverse the machine's path will experience greater stress than those in undisturbed areas.

But it's not just a matter of reducing oxygen availability to roots. You may have read about the importance of mycorrhizae. These fungi, which are often host-specific, contribute a tremendous amount to tree health. But mycorrhizae need a robust soil microbial community and good soil structure to thrive. Compacted soils are much less hospitable to them, and their prevalence drops.

Sugar maples have become species of concern, with greater mortality following tent caterpillar outbreaks, slower growth rates, paucity of red fall coloration (a stress marker), and other signs of stress. Adirondack sugar maple growth-rate research led by SUNY-ESF and published in October 2015 is beyond alarming. As study co-author Dr. Neil Pederson, an ecologist at Harvard Forest in Massachusetts, put it, "I have never seen anything quite like this." Given what we know about the state of sugar maples, it's even more critical to avoid harming roots and introducing further long-term stress.

On the commercial side, the hitch (so to speak) is that forestry equipment is bigger now. Like many of you, I can recall when a John Deere 440 was considered good-sized, so my jaw dropped when in 2007 a contract logger showed up for a thinning cut at my 20-acre woodlot near Colton NY with a JD 640. This beast weighs 36,790 pounds, over three times the mass of a 440, and the ruts it made will persist for generations.

The carnage left in the wake of modern forwarders and skidders goes beyond compaction – we're talking about roots being sheared with every pass. This is why I lump skid trails with rock outcrops as equal obstructions to root growth. Knowing that a typical root system extends twice the branch length at minimum, it's easy to gauge how badly a tree right on a skid trail is harmed.

"That is not all. Oh no. That is not all!" as the Cat in the Hat said. Root injury results in trees toppling over. New York State Extension Forester Peter Smallidge writes that "One reported study noted that the best predictor of windthrow was proximity to skid trails." Peter suggests that "...it is root damage in general that should be avoided" in harvest operations. A related issue that

deserves its own article is the introduction of root-rot pathogens like *Armillaria mellea* and various heart-rot fungi through root injuries.

When a long-time Adirondack maple producer decided to get out of the business in 2000, he had a forester manage a partial harvest of his sugar bush, after which he gave the parcel to his son, a friend of mine. That was an especially wet summer, and the JD 640 wallowed up to its belly pan in ruts, but the loggers cut exactly as the forester had marked. Unfortunately, the operators backed up to every tree rather than parking on a main trail and spooling out cable. Trees began to decline quickly in about 2004, but they didn't get a chance to die. By 2016, not a single hard maple was standing on the site, every one of them windthrown.

Timing of forestry operations is more important than ever. It's not a perfect world, of course, and we can't always wait until things dry out to work in the woods. Plus, the Great Lakes and New England regions are already wetter on average than 50 years ago, a trend that is expected to continue. But we can stay on our forest roads, and demand that loggers do the same. Maybe we can even help operators figure out what that cable on the back of their skidder is used for.

Paul Hetzler is an ISA-Certified Arborist and former Cornell Extension educator.

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Two great stories from the Forest Ethicist

OF ORDERLY FORESTS AND THRIFTY TREES

By Marianne Patinelli-Dubay

All that talk in the recent column about work and industry got me thinking about 'slack.' In environmental terms, slack refers to unmanaged or under-utilized forests. It is what Gifford Pinchot described as the 'myth of idyll resources.' Pinchot was responding to a growing preservationist movement led by John Muir that equated wilderness with the sacred and threatened to romanticize wild character at the expense of working forests. In a Conservation Day speech in 1926 Pinchot declared:

We have vast stretches of idle forest land. It brings no good to anyone. It pays little or no taxes, keeps willing hands out of work, builds no roads, supports no industries, kills railroads, depopulates towns, creates a migratory population, all of which work against a good and stable citizenship. Idle forest serves no one well. It is a menace to our normal national life (177-8).

To the untrained ear it might seem wrong-headed to promote forest industry during a Conservation Day address. But readers of this magazine will recall that conservation was Pinchot's utilitarian response to the preservationist approach of Muir and his contemporaries. From early on, conservation went hand in hand with "wise use" and the two concepts (management and conservation) were more friends than foes despite a 21st century disconnect between conservation and management.

After all, forest management and responsible industry developed together as a two-part measure in response to the massive deforestation that occurred in the time before lumbering came to be regulated by forest science. Following Pinchot's lead and famously enlarging conservation to take in land health more broadly, Aldo Leopold turned his attention to balance and reciprocity in the context of whole system health in 1933 when he writes:

A harmonious relation to land is of more consequence to civilization, than the historians of its progress seem to realize. Civilization is not, as they often assume, the enslavement of a stable and constant earth. It is a state of mutual and interdependent cooperation between human animals, other animals, plants, and soils, which may be disrupted at any moment by the failure of any of them. Land-despoilation has evicted nations, and can on occasion do it again (77).

Later still, in 1961 the Chief of the US Forest Service, an agency shaped by the legacies of both Pinchot and Leopold, declared that the aim of forestry was to put healthy forests to use in order to "add to the economic and cultural foundation upon which our future as a nation and a civilization depend" (109). I read the emphasis here on *healthy forests* and on *futures*, both necessary parts of a thriving system and goals of competent land management.

The key to understanding how *use* and *industry* can (and should!) coexist with the goals of healthy forests and futures is held neatly within the virtue of temperance or restraint. The fact that conservation and resource management are sometimes at odds, suggests a failure to understand the role that restraint ought to play in logging, forestry and related professions.

Pinchot and Leopold would have agreed on the importance of temperance in resource management given that the aim of good management is a flourishing system – the whole system of human and non-human beings and values. Without restraint and responsible management we are left either with an unpeopled utopia, or a wasteland where a healthy landscape ought to be.

‘Regulation’ is the law and order term for restraint or temperance and it is what we draw on to encourage virtuous behavior, without having to rely on anyone actually taking the virtue to heart. I am sometimes discouraged that we have to rely on tactics or procedures in the absence of felt concern for our common home. But I am reminded that this is not a new workaround considering that twenty three hundred years ago, Meno famously asked,

Socrates, can you tell me, is virtue something that can be taught? Or does it come by practice? Or is it neither teaching nor practice that gives it to a man but natural aptitude or something else?

Socrates and Meno go around and around on the question and even though I’ve been asked to go more deeply into the ancient traditions in this column (just kidding), I will just tell you that they reach no real understanding apart from a lovely if minor claim, that *a virtuous man would be a solid reality among shadows*.

Marianne Patinelli-Dubay leads the Environmental Philosophy Program at SUNY-ESF’s Newcomb Campus on the Huntington Wildlife Forest. In addition to teaching and writing, Marianne Chairs the Adirondack Chapter of the Society of American foresters and is an active member of the Forest Stewards Guild. Please send comments to mpatinelli@esf.edu.

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PHILOSOPHY AS WORK AND MEANWHILE, MY BEANS

By Marianne Patinelli-Dubay

Meet me at the bottom, don’t lag behind
 Bring me my boots and shoes
 You can hang back or fight your best on the front line
 Sing a little bit of these workingman’s blues
Bob Dylan, from Workingman’s Blues #2

It was a singular experience that long acquaintance which I cultivated with beans, what with planting, and hoeing, and harvesting, and threshing, and picking over and selling them, – the last was the hardest of all, – I might add eating, for I did taste. I was determined to know beans.

Henry David Thoreau, from Walden

I’m not sure any tradesperson in the history of the world has ever used “philosophy” and “work” in the same sentence. At least not in the way you might use “log” and “job” together or “field” and “work.” There’s something fundamental about the concept of work that entails labor and a laborer, and philosophy is either something you have or

something you study but it isn't usually associated with work that you do. It's the *doing* that philosophy often seems to lack.

The absence of Philosophy in the workaday life of everyone who punches a clock and reports in, laces up their boots, heads out and toils is the unfortunate consequence of its pride of place in a liberal arts education. A liberal arts education seeks literally to liberate academic study from the professions, to favor the life of the mind over industry.

The life of the mind is more in keeping with what many imagine philosophers do all day, perfecting one's character through moral, religious, and intellectual development through time spent in nature, study and conversation with great minds and books (Raymond, 141).

On the far end of this long tradition, philosophy has become synonymous with jabber and most people assume that philosophical thinking is meant to be set apart from real life and work, that it has no guidance to offer our daily worldly encounters and nothing useful to say. The regular practice of thinking through what life brings us that began between working men talking in the city streets is not worthless, but perhaps today's philosophers are.

The life of the mind is meant to be put to practical use in developing a good and fulfilling life, but that life typically doesn't include a skid-steer, a pickaxe or a forwarder. And *that* is a very great loss; not because anyone should trust me to run a loader or to wield anything sharper than a paring knife, but because an equipment operator and a forester could make practical use of what philosophers have spent so much time thinking about if only philosophers paid more attention to people like Henry David Thoreau.

Henry believed in a life of the mind as a means of discovering the work we are meant for and infusing it with moral, if not spiritual, significance. He believed the answers to life's big questions arose from this dedication and made clear the kind of work one should do, how one should do it and how it contributes to the common good. He believed that exercising skills under the right conditions (in tune with nature), for the right reason (needs not wants), and for a limited amount of time could make work pleasurable and more likely to be morally correct.

Mastering the craft of land surveying helped Henry to connect the work that one does with its benefit or harm to society. Working as a surveyor taught him that there was a right and a wrong way to do the job, and that the man of integrity must follow the muse of the craft to do the job in an honest and agreeable fashion (Raymond, 131-2).

Henry bridged the divide between ideals and application that is usually left wide open. This disconnect between philosophical insights and their usefulness has been on my mind as I work out how to fashion philosophy into a tool that resource managers can use. After all, almost every profession except natural resources has enlisted philosophy to give insight and direction: engineering, science, farming, mathematics even microbrewing - as in beer.

My struggle to put philosophy together with natural resources mirrors the practice and principle that guided Henry's thinking; attending to this disconnect deepened his understanding of the role of work in the human condition. He argued that the elimination of work is not paradise restored, but paradise destroyed and that right-thinking foregrounds right-doing. Like his friend and fellow philosopher Ralph Waldo Emerson, Henry believed that work satisfies our talent and without work we lose an essential part of our humanity (Raymond, 143).

The question is how to draw ideas and ideals into the ordinary rhythm of work and life, to make lifework of mere labor. The answer is in the doing. For clues about how to proceed I return to *Walden* to find Henry tending to his crops musing, "meanwhile my beans, the length of those rows, added together, was seven miles already planted, were impatient to be hoed, for the earliest had grown considerably before the latest were in the ground; indeed they were not easily to be put off. What was the meaning of this so steady and self-respecting, this small Herculean labor, I knew not. I came to love my rows, my beans (Thoreau, 115).

David B. Raymond, The Aim of the Laborer: Critical Assessments of Henry David Thoreau's Philosophy of Work. In The Concord Saunterer – a Journal of Thoreau Studies. The Thoreau Society and Bridgewater State University, 2021.

Henry David Thoreau, *Walden*. Harper and Row, 1965.

Marianne Patinelli-Dubay leads the Environmental Philosophy Program at SUNY-ESF's Newcomb Campus on the Huntington Wildlife Forest. In addition to teaching and writing, Marianne Chairs the Adirondack Chapter of the Society of American foresters and is an active member of the Forest Stewards Guild. Please send comments to mpatinelli@esf.edu.



Do Nothing about Invasive Plants and Deer

Paul Hetzler

Until recently, ignoring problems in hopes they'll go away hasn't served me well. However, a decade-long study done by Cornell University researchers has clearly shown that avoidance is the best way to manage garlic mustard (*Alliaria petiolata*), a pernicious exotic plant. Evidently I've been doing a great job in the fight against this aggressive and troublesome invader.

Native to most of Europe and parts of western Asia and northwestern Africa, garlic mustard is in the cabbage and broccoli family (*Brassicaceae*), and indeed was imported to North America as a culinary herb in the early 1800s. It's not entirely evil, as it has the spicy tang of mustard with a hint of garlic, and can be used as a base for pesto and sauces, and to flavor salads, soups and other dishes. Unfortunately, eating it has not worked well as a control strategy.

Garlic mustard is a biennial that begins as an inconspicuous first-year plant (rosette). At a glance, its rosettes look similar to wild violets, having triangular, somewhat heart-shaped leaves that have coarsely toothed margins and a wrinkled leaf surface. In the second year it sends up a tall flower spike, the four-petal white flowers developing into slender pods (siliques) bursting with tiny round seeds. This is actually one of garlic mustard's unpleasant features, as it loads the soil with seeds that remain viable for ten or more years.

Like all invasive plants, garlic mustard is not browsed by herbivores (if you don't count vegetarian humans), and has no effective insect pests or diseases to keep it in check. As mentioned, it gets high marks for reproduction, and can form thick monocultures in forest environments. Its roots exude compounds that alter the soil chemistry to favor its survival at the expense of other species. Known as allelopathy, this mechanism also harms mycorrhizae, symbiotic root fungi which contribute greatly to tree health. When dense armies of these plants compete for water, nutrients and sunlight, natural forest regeneration is curtailed and native ground cover is stressed.

Sounds like we should gather a posse and rise up against this intruder; pitchforks, torches, and pikes at the ready. Well, yes and no. If garlic mustard has just appeared at a location in the past one or two years and their numbers are low, yes – yanking them out by the roots is the thing to do.

But according to Dr. Berndt Blossey, a Cornell University conservation biologist who specializes in invasive plants, pulling up large swaths of garlic mustard is not only futile, it is worse than leaving it alone. It's worth echoing: When well-intentioned people rip out this stuff, it actually prolongs the infestation period because the plant is self-limiting (more on that below) if undisturbed. Also, these mass garlic mustard-ectomy events do more damage to the ecosystem than the target species itself does.

There are cases where research seems pointless when cause and effect are so obvious: maple sap flows up from the roots during the day; goldenrod causes allergy symptoms; and garlic mustard wipes out native wildflowers and adversely affects salamanders. These assumptions make sense, given the "evidence," but upon close examination, all of the above statements are false.



Flowering Garlic Mustard.

Photo: Rod Sharka

Dr. Blossey has long contended that deer abundance and non-native earthworms are the drivers of garlic mustard infestation. Garlic mustard only establishes after earthworms have invaded a site for some years, he says, and although how deer spread earthworms is not yet known, they apparently do, as exclusion plots have shown. I first heard Berndt's idea that well-established garlic mustard should be left alone in 2014 at a talk he gave at Cornell. I was shocked, and admittedly rather skeptical. But he and his team have now done enough controlled trials and amassed enough evidence to back up his assertions.

It turns out that while garlic mustard competes with native species, it does not displace them where deer are excluded or drastically reduced in number. And it is earthworms, not our maligned invasive plant, which make a neighborhood less attractive to salamanders. Furthermore, garlic mustard dwindles in biomass, plant vigor, and site prevalence over time. Within ten to 12 years it becomes scarce as a species, and the remaining plants are greatly stunted.

Side-by-side controlled trials showed that where garlic mustard is "managed," the plants are considerably larger, and cover a much higher percentage of a site (at times by an order of magnitude) than the sections where nothing has been done. Not only that, but biomass on the managed sites tended to be roughly stable over the ten-year time frame studied, whereas it declined year after year in the unmanaged plots.

Pulling garlic mustard where it is abundant prolongs its run. It also robs a great deal of nitrogen, macro- and micronutrients, and organic matter from the ecosystem. Mass-removal also results in the site being trampled, and runs the risk that soil and native plants might be inadvertently removed.

A much better use of our time and energy, Dr. Blossey advises, is to scout sites that aren't known to have garlic mustard yet, and also to kill as many deer as possible. Especially the latter.

An interesting side note is that if deer were managed to 5-7 per square mile, not only would it drastically reduce the rate of garlic mustard spread, Lyme disease would cease to be a human-health threat (this from Dr. Paul Curtis, the NY State Extension Wildlife Specialist at Cornell University). I say amen to that!

Professor Blossey's February 26, 2021 talk "When Doing Nothing is the Best Invasive Plant Management Tool" can be found at <https://www.youtube.com/watch?v=vRQal0Hq5nM>

A former Cornell Cooperative Extension Educator, Paul Hetzler is often in a recliner, helping to fight garlic mustard.

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Have you checked out PIF's website?

www.partnersinforestry.com

The website is for members to expose your business, service or tree farm, share thoughts, ideas, articles, photos, and links.

This is your COOP, we need your input as much or more than your dues.

Another suggested Old Growth visit: A big thank you to John Bates and Our Living Ancestors for these great features

Scott Lake and Shelp Lake SNA

Location and Directions: Forest County within the Chequamegon-Nicolet National Forest. T38N-R12E, Sections 8, 9, 16-21.

From the junction of Highways 45 and 32 in Three Lakes, go east on Hwy. 32 for 4.7 miles, then turn left (east) on Lake Julia Road and go 0.6 mile, then south and east on Scott Lake Road (FR 2183) 2.6 miles to a tiny parking area on the north (left) side of the road marked by a post with a birding symbol on it. A trail and boardwalk lead north to Shelp Lake, and a $\frac{1}{2}$ mile loop trail south of the road leads into the forest.

Drive another 0.2 mile to another tiny parking area on your right to see Scott Lake. On our visit in late May of 2013, eight trumpeter swans were foraging on the lake.

Size: 1,674 acres overall with 46 acres of old-growth pine and hemlock-hardwoods

Forest Type: Hemlock-hardwood with white pine super-canopy

Age of the oldest-known trees: 240 years (Tyrrell 1991), but others are said to be over 300 years.

Status: Owned by the Chequamegon-Nicolet National Forest. Shelp Lake is a Research Natural Area within the federally designated Headwaters Wilderness. Along with Scott Lake, this is part of a cooperatively designated State Natural Area established in 1974.

Two small, undeveloped wilderness lakes, Scott and Shelp, are bisected by a 46-acre remnant stand of old-growth pine and hemlock. Most of the large pines are 37" dbh, likely indicating a similar germination period. Albeit small in acreage, this is a true remnant old-growth stand, one of the few left that one can walk in and experience what much of the original landscape felt like. It's highly recommended!!

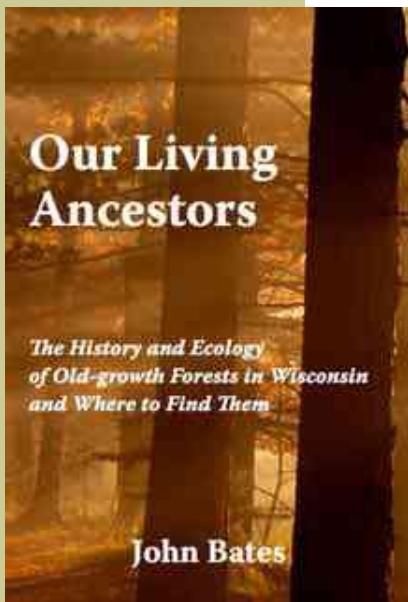
Characteristic nesting birds in and around this site include blackburnian warbler, blue-headed vireo, gray jay, boreal chickadee, and olive-sided flycatcher. This area is also well-known for harboring winter finches like pine siskins, common redpolls, and pine grosbeaks.



Aerial view of Scott and Shelp Lake



Scott Lake white pine



Our Living Ancestors: The History and Ecology of Old-Growth Forests in Wisconsin (and Where to Find Them)

By John Bates, softcover, 336 pages, over 200 maps, photos, graphics, \$27.95 retail.

Note: John is offering the book at a discounted cost of \$20.00 to PIF members, just mention that you are a PIF member and saw the ad in the PIF newsletter. \$5.00 of this special offer will go to the Northwood Alliance, Inc

Discounted books may be purchased directly from John at manitowish@centuryTel.net or 715-476-2828. Snail mail may be sent to John Bates, 4245 N. Hwy 47, Mercer, WI 54547.

“Our Living Ancestors is a remarkable blend of the beauty, history and ecology of Wisconsin’s 16 million acres of forest. This book should be required reading for all who depend upon and care about our amazing forests.” Michael Dombeck, PhD, Chief Emeritus, U.S. Forest Service

“Our Living Ancestors is a remarkable blend of the beauty, history and ecology of Wisconsin’s 16 million acres of forest. This book should be required reading for all who depend upon and care about our amazing forests.” Joan Maloof, Founder and Director of the Old-Growth Forest Network

“The book is a veritable goldmine of information . . . There is simply no better book written on these topics for a wide audience.” Robert T. Leverett, co-founder, The Native Tree Society; co-author, *The Sierra Club Guide to Ancient Forests of the Northeast*

FUTURE ARTICLES

If you have questions that you would like to see addressed in the newsletter, suggestions for, or have articles for, future newsletters, please contact us at partnersinfoforestry@gmail.com or by mail:

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Club Moss? Princess pine, ground pine, ground cedar, wolfs paw- it's Lycopodium.

Information compiled from numerous sources.

If you hear "moss", you picture greenish, low-growing, soft groundcover in the woods. For the most part, you'd be right. But what about reindeer moss? It's not a moss at all, but a lichen. Clubmoss is another misnomer – the plant may resemble a large moss, it isn't. In fact, it may be more closely related to ferns (that is debatable) than it is to true mosses.

Clubmosses is a common term for plants which belong to the family Lycopodiaceae, are vascular plants that do not have flowers and that reproduce sexually by means of spores (like mushrooms, ferns and true mosses). Clubmosses have stems, which true mosses don't, and the sporophyte, at least, has real roots – true mosses don't have roots. Only a tiny number of Lycopodium spores will develop into mature plants, and that process can take up to 20 years.

Often called Princess Pine, Lycopodium comes from Greek words luko (wolf) and Podos (foot) is sometimes called wolfs paw or wolf foot. It is a tiny evergreen. Two varieties are most common in our region's northern forests and are sometimes harvested in fall for Christmas decorations. With the snow gone and little yet green, they are easy to find.

Lycopodium denroideum is round branch ground pine while *lycopodium obscurum* is flat leaved ground pine. Both are called Princess pine. A *Lycopodium complanatum* is related, but rarer and is called ground cedar.

Princess pine, as you might expect, looks a lot like a miniature conifer tree. Also called ground pine, at one time it was harvested extensively for holiday decorations. As with many wild harvesting efforts, gatherers did not earn much for the time and work expended. As a result, when patches of the desired plant were found, they were often cleaned out. Such unsustainable harvesting practices resulted in many plants becoming rare. Today some clubmosses are among the many native plants that are protected by law in places.

Lycopodium spores were used historically for flash powder and pyro technics, as they are highly flammable. However, the spores burn fast and bright, but with little heat as spores are also used in science classes to demonstrate the principles of combustion.

It turns out, however, that clubmosses had many more historical uses. According to a couple sources, the Woodland Crees would rub raw fish eggs into stiff clubmoss to separate them from their gelatinous membranes. After they were separated, the eggs were used to make fish-egg bread. Clubmoss spores found their way into surgery as a dusting powder, and were even used to treat conditions like eczema. At one time the spores were used as baby powder, because they are water repellent. Apparently if you cover your hand with the spores and then submerge it in water, it will not get wet!

Spores from *L. complanatum* (ground-cedar), were used by the Blackfoot people as an antiseptic and to control nosebleeds. They also used the entire plant as a mordant, which is a compound used to set dyes.

There is a spiritual component as well. The Dakelh people of British Columbia at one time used clubmoss spores to determine if the sick would survive their illnesses. The divination process was simple: spores were dropped into a



At least two different club mosses- lycopodium plants are common in the northern forests

container of water. If they drifted in the direction of the sun, the patient had a good chance of survival. Before penicillin was heard of and belief in the spiritual world was strong, it may have been the difference in a person's will to live.

Humans aren't the only creatures that benefit from these tiny plants. Clubmoss clumps provide protective nesting sites for ground-nesting birds including hermit thrushes and ovenbirds. A recent study found that the presence of tree clubmosses at nest sites significantly increased ovenbird nest survival rates. These *Lycopodium* species contain alkaloids that make them unpalatable to deer, so they have not suffered from over-browsing like many sensitive plants. But their populations have been adversely affected by the actions of non-native earthworms, which break down the duff layer on the forest floor, thereby changing soil composition and reducing the availability of nutrients. Overharvesting, non-native earthworm invasion, and habitat destruction have resulted in these tiny tree-like plants being less abundant than they once were. Careful forest stewardship can help to preserve these ancient inhabitants of the Earth.

If you are considering harvest of *Lycopodium* for decorations, do it with great care. Pluck only the mature stem, without disturbing the rhizome or ariel stems. Allow a minimum of two years between harvests. Do not harvest anywhere without permission. Most public forests require permits if harvesting is allowed. As with a desire to harvest any plant, think of the sustainability of the resource. Tribal Elders First Nation Wisdom applies: *Take only what is needed. Pay your respects. Leave all the rest.*

The Old Growth Forest Network recently released a summary of what they term Vitamin F, for forests. They cite several factors in forest benefits on Human Health, which we have discussed previously in these pages. They have four factors in the summary: 1, Immersion in forests benefits human health and well-being. 2, The mental and physical health benefits of forests should be considered as an eco-system service value of the forest. 3, Humans need access to high quality forests. 4, Publicly accessible forests, especially old-growth forests, are urgently needed.

The full report can be seen here: <https://static1.squarespace.com/static/5c087e9e4cde7a66033e482d/t/6048be0a40379d6b00fb1bd6/1615379988991/Forests+and+Human+Health.pdf>

With our access to many exceptional forests in this region, we can consider ourselves lucky, and we should get out and enjoy the numerous benefits to us all. And do support our public lands.

Easements for Access: the good, the bad and the ugly

By Joe Hovel

As landowners or managers, many of us have experience with either the benefits of easements or the burden of them. For some reason this issue never rests for long; after a few months with no easement conversations, recently they have popped up from several people.

I have plenty of experience with the access easement issue. Some years ago, I wrote a short opinion piece called the Ultimate Invasive, following a ridiculous court case a neighbor was burdened with when their family was lied to (in writing) about the use of an access easement. When the neighbor reacted in an attempt to protect his property rights by blocking off the easement, he was sued by the developer and suffered severe financial hardship. The lie was in the letter they received stating 'use for one family to access their nature preserve' actually turned into a three-lot

subdivision. The easement document was much vaguer. The court ruled the easement was valid for the subdivision, agreed the family was lied too, but stated they were fools for signing the easement!

More recently I wrote another much longer summary of a lawsuit I experienced in central Wisconsin, when a newer neighbor blocked off an access, we had used to a forested parcel for over 40 years. This was yet another ridiculous and expensive experience. I titled that story 'Idiots & A-holes', and could not think of a better title given the experience.

My hope in writing this is simply to share some facts regarding access easements, to help you and your heirs avoid the expense and tribulations of lawsuits while you use or protect your property rights. I have learned these facts from past experience and in studying a book titled the Wisconsin Law of Easements by Jesse S Ishikawa, from the Wisconsin Bar Association.

Definitions of access easements are vague; however, the commonly used definition is: *a non-possessory interest in land that gives the holder the right to use the land of another for a specific use and without profit.* This is very different from purchasing a strip of property in title in order to achieve access.

Key words include: *Non-possessory* which means the grantee does not own it but can use it. *Interest in Land* means a permanent interest in another's land with the right to enjoy such interest freely and without obstruction. *Owned by another* means two different parties need to be involved, one cannot grant an easement to themselves. *For Specific Use* means the parties must well define the uses in the easement document to avoid future problems and wrong interpretation! *Without Profit* is rather obvious as the easement grantor cannot collect rent for the other parties' use.

Benefits and Burdens: Here is where some become surprised. Every easement has a benefit of the right to use the easement. The burden is the obligation imposed on the lands subject to the easement.

There are 2 classes of easements also. *Easements Appurtenant* benefit a particular piece of land. The benefited property is the **Dominant** Estate or the Dominant Tenement. The burdened parcel is the **Servient** Estate or the Servient Tenement. The other class is called Easement in Gross which refers to a person or groups of people who benefit, thus there is not a dominant estate, but there is of course a servient estate.

Creation of Easements: this can be done in one of seven ways. With some of these seven being unfamiliar to most of us.

1: By a written grant on a legal document: identifying the parties, the land, the interest conveyed (show exceptions etc.), be signed by all grantors and spouses (if marital property), and be delivered-recorded.

2: Implication: Is common if one sells a given portion of a greater holding and the seller-buyer do not grant a separate easement document. Courts may now state the implication of the easement was in the transaction, meaning the sale implied the access.

3: By Necessity: This differs from implication in that implication has no specific location. This appears to be a very controversial matter as well, as how does one prove necessity? This does not force an easement for one who may purchase land locked property. Necessity, if achieved, is terminated at first opportunity for other access.

4: By Prescription: This is similar to adverse possession. Over 20 years of uninterrupted use an easement can be acquired if the use is hostile, visible, open and notorious. If the owner gives permission the use is not hostile, though hostile does not mean ill intent. The visible, open and notorious presumably means you cannot gain this status by 20 years of hidden use, it must be in the open and without the owner giving permission for the use. Uninterrupted means that the use was not broken over the 20 years, by an owner blocking off, or even granting the user permission for part of the time. These things interrupt the prescriptive use.

5: By Notations, Plats or Surveys is common in a major subdivision creation, where a plat or a certified survey may clearly show locations of access roads using notations for use. This is commonly demanded by local units of government in creating plats or subdivisions.

6: Condemnation: Easements of Condemnation can only be made by authorities with such powers. State, county, towns, villages, even school districts and utility companies can possess these powers of condemnation.

7: By Vacation or Discontinuance of Public Right of Ways. If a public road is abandoned the users of such right of way for property access, retain the rights which remain in force.

There are also several critical factors under construction of the access. Perhaps most importantly is the location clause, which states: If the location of an easement is indefinitely described, the conduct of the parties will determine the exact location. This may be a troubled area, as a landowner purchasing a burdened parcel may not think the location was fair, however it may have been the practical location chosen by both parties. This was the case in our central Wisconsin lawsuit. The new owner of the burdened estate claimed the road should be at the boundary line, however a deep ravine prevented such use as the parties mutually agreed to a more practical route four decades earlier.

The above writing barely touches the surface of this issue in regards to access easements. If you enjoy use over an easement, avoid controversy, stay within your rights and re-record your easement within a 40-year time frame. Also conduct repairs as required and keep a servient neighbor happy by not over using or abusing your and the other parties' rights.

If you own the land burdened by an easement, you must accept the fact that your land is servient to the grantee of the easement, within those described rights. This is difficult to understand for some who purchase land without full knowledge of all consequences.

If you are considering entering into an easement with another party, be specific as to what the needs are, and list any exceptions in the terms. For example, if a neighbor needs access to manage his woodlot, the document can state 'for ingress and egress for forest management only', (one could even limit the use further) 'with in the hours of 6 AM to 6 PM'. Also state the width, location if it can be accurately described or 'over existing roadway'. One can be more generous of course, but still state something like 'this easement is to benefit one whole owned parcel only and terminates if that parcel described is subdivided'. While there are lines in easement law about overburdening, they are not specific enough, as my neighbor found out years ago. Of course, we may feel that adding a parcel or two to the easement is an overburdening an easement use, a circuit court judge in that case did not. Envisioning the future can be very difficult. However, having foresight in considering these factors in planning an easement can save a lot of grief later.

There are of course other ways to be good neighbors without granting away your property rights or becoming burdened. You can grant permission and control the situation to avoid a future prescriptive claim by giving the users a key to a gate, sign a document granting permissive use which you can withdraw permission at will, or simply control the situation with a token rent, say you ask \$1 per year.

We advocate for landowners to get along and be respectful while protecting your land and property rights. Litigation is costly, time intensive and often the winners and losers are quite grey! I have seen this both from a servient position and from a dominant user position. And most of all seek counsel. Be certain to receive good legal advice prior to signing.
