Spring 2022

Minnesota
MFA Woodlands

Minnesota Forestry Association

MFA: an organization of, by and for Minnesota's private woodland owners and friends.

www.MinnesotaForestry.org

Minnesota Forestry Association (MFA)
info@minnesotaforestry.org
PO Box 6060
Grand Rapids, MN 55744
218-879-5100

MFA Newsletter
Vol. 24 No. 2
Spring 2022
The Minnesota Woodlands newsletter is published by the Minnesota Forestry Association.

MFA Board Meetings
Conference Calls
8 – 9 a.m.

- May 10, 2022
- June 14, 2022
- July 12, 2022
- August 9, 2022
- September 13, 2022

Editor
Kassandra Tuten
editor@minnesotaforestry.org

Graphic Design
Peg Churchwell
Lady Dog Design
PegChurchwell17@gmail.com

From the President

Dave Roerick

Greetings,

Spring is trying to make an appearance, even though old man winter is still reminding us what can happen, especially in the northern sectors of the state where we received 6 to 8 inches of snow on March 22. In spite of the snow, the pussy willows are budding and the maples are beginning to produce an abundance of sap.

There is good business news for private landowners in the northern part of the state as the Cohasset City Council accepted a revised environmental review for Huber Engineered Wood on March 8. The proposed mill is planned to be built on 400 acres next to Boswell Energy Center located about 5 miles west of Grand Rapids. The $440 million investment in an Oriented Strand Board, or OSB, plant will be good for private landowners. Aspen, the primary product for the mill, has an annual sustainable harvest of 2.36 million cords per year. As a reference point, Minnesota only harvested 1.43 million cords in 2018. Huber intends to utilize about 300,000 cords of aspen per year, which leaves plenty of wood for the proposed new mill.

This venture is a great opportunity for private landowners, as the least utilized wood base in the northland is on private land. It will also be a huge support to increase the amount of carbon sequestered by regenerating some of the older forests. It's an effective way to reduce climate change, provide for a healthy, vigorously growing forest, provide a return on the investment for landowners, and provide jobs for timber producers and industry. This Minnesota investment is not only good for the forest, it will also stimulate Minnesota's economy by enhancing and producing many new direct and secondary jobs.

I will close by reminding you that the next several weeks are a great time to review your stewardship plan, and/or walk through your woods, to consider the next project to keep your woodland healthy and vibrant.

Your president,

Dave

New Methods for Detecting Oak Wilt

By Dr. Gerard Sapés, University of Florida

New paper alert! Dr. Gerard Sapés and collaborators from the University of Minnesota and other institutions around the globe recently published work conducted at Cedar Creek on new ways to detect oak wilt. Dr. Sapés summarizes their findings from the *Remote Sensing of Environment* journal article to follow:

Continued on page 2

Away from home for a time? Please contact the MFA office if you'll be away from home for an extended time and let us know when you'll be back. We'll hold onto the newsletter until you return so you won't miss a single issue! Email info@minnesotaforestry.org or call 218-879-5100.

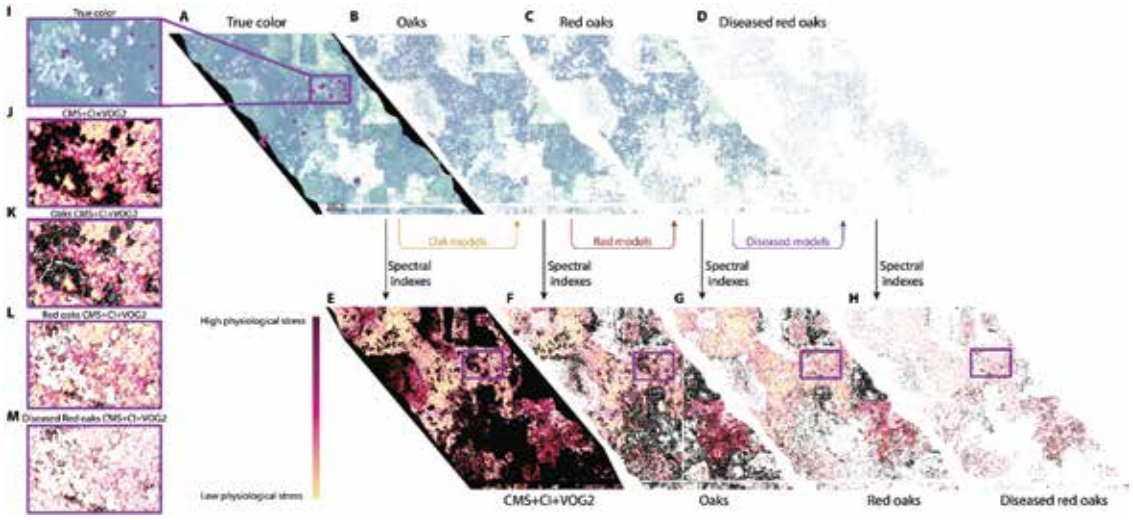
Detecting Oak Wilt continued

Oak forests are under threat by an invasive fungus that cripples and kills trees: oak wilt. By the time an oak tree shows visual signs of oak wilt disease, the fungus has often infected other neighboring trees, which makes it very difficult to locate, contain, and remove the disease. Accurate detection and monitoring tools that can quickly scan large areas in search of oak wilt can make the hunt for the fungus much easier.

Through research at Cedar Creek, we have found ways to use the light reflected from canopies as a tool to detect oak wilt because this light contains huge amounts of information about the identity of trees, their form, function and composition, and their health status. For instance, visible light—which our eyes can see—is already enough to allow humans to distinguish an oak from a pine. However, there is a whole range of light wavelengths that are invisible to our eyes that we can take advantage of using sensors that see such wavelengths. We found that Near Infrared and Short-Wave Infrared wavelengths hold information that can be used by artificial intelligence algorithms to differentiate oaks from trees that are not oaks (90% accuracy), the more oak-wilt-vulnerable red oaks from the more resistant white oaks (93% accuracy), and healthy red oaks from those carrying the oak wilt fungus (80% accuracy).

Including shortwave infrared wavelengths increases the model's accuracy by 20% relative to algorithms that use visible and near infrared wavelengths alone. Algorithms also perform better when they are faced with broad, simple, and consecutive questions such as "Is this tree an oak or not? If it is an oak, is it a red oak or not? If it is a red oak, is it healthy or not?" than when faced with only one highly specific question such as "Which trees across this whole forest are diseased red oaks?". Through our algorithms, we were able to determine the most important wavelengths to identify oaks, red oaks, and diseased red oaks. We also found that physiological signs of stress such as declines in pigment content, photosynthesis, and plant water content—information that is also embedded in the light reflected from canopies and considered by our algorithms—differentiate non-infected and oak-wilt-infected red oaks.

We conclude that, by coupling algorithms that use broad, simple, and consecutive questions to identify potential host trees such as red oaks with light wavelengths that hold information on the physiological stress of trees, we can develop powerful tools to detect infected trees across the landscape.



Mapping of the group's AISA Eagle PLS-DA models. The original caption reads: "The oak discrimination models were applied to the full scenery (A) and the resulting map was used to mask out pixels with an average probability of being an oak lower than 0.5 (B). The red oak models were applied to the remaining pixels and pixels with an average probability of being a red oak lower than 0.5 were masked out (C). Finally, the diseased models were applied to the remaining pixels and pixels with an average probability of being a diseased red oak lower than 0.8 were masked out (D). The blueish-green color scheme in A-D and I panels is the true color of the image after normalizing the spectra of each pixel. Additional insight can be gained by mapping a combination of spectral indices across the landscape to evaluate stress levels (E) after applying the oak (F) red oak (G) and disease red oak (H) masks. On doing so, areas where we identified diseased red oaks during our tree survey (panel I corresponding to purple insets in panels A, E-H) show high levels of stress (J) which correspond to oaks (K) and, specifically, red oaks (L) that potentially harbor the disease (M).

Member Profile: Nikki Henger

I was born in Hawaii and lived there for the first five years of my life but grew up in Ohio (only slightly different climates). While Ohio isn't known for lush forests, I still loved hiking with the family and exploring the local woods. As I grew up, I continued to enjoy being outside and decided to pursue a degree in environmental biology at the nearby college, University of Dayton. After graduating, I knew I needed to leave Ohio for a while and traveled to New York to attend State University of New York – College of Environmental Science and Forestry. It was in graduate school and visiting the Adirondack Park that I truly began to appreciate nature and how important it is to protect the woods. The Adirondack Park, located in northern New York, is protected as "Forever Wild" by the New York State Constitution and is the largest park in the contiguous United States. After living in upstate New York for a couple years, being so close to such a beautiful park, I knew I wanted to live in a heavily forested state.

I moved to Minnesota a little over two years ago to work at Wild Rivers Conservancy of the St. Croix and Namekagon. We are the official nonprofit partner of the St. Croix National Scenic Riverway and inspire stewardship to forever ensure the ecological integrity of the St. Croix and Namekagon Riverway. I am the forestry program coordinator and work with woodland owners in the St. Croix watershed to help them protect and manage their woodlands by connecting them to the appropriate tools and resources in the watershed. You can think of me as Google for forestry questions. We created the My St. Croix Woods program because protecting our woods means protecting our waters.

A long-term goal of mine is to live in the woods, but I currently live in a northern suburb of St. Paul. I have a silver and a Norway maple, ash, and a few fir trees scattered on the half acre lot. I live with my two cats and partner, Jarred, who works at Stantec and is a water resources engineer. Our house is filled with lots of talk on trees and water. While I only have a few trees, I still tapped my single silver maple and shared the sap with the neighbors and taught them how to identify different maples. I am in the process of converting my grassy yard into a pollinator garden. After only a few plantings, I noticed several species of native bees and other insects start to visit my yard. You don't need 40+ acres to be an environmental steward!

While working at Wild Rivers, I was recruited to join the board of the Minnesota Women's Woodland Network (MNWWN) back in 2019 and became secretary. Through MNWWN and my current job, I became aware of MFA and was elected to the board officially this year. I am looking forward to exploring my role with MFA and connecting with others who are passionate about Minnesota's woods.

I hope to see some of you at the events and workshops!

Top: Nikki Henger dressed as a tree for Earth Day.

Bottom: The start of Henger's pollinator garden. The purple flower is hoary vervain.

Trees Don't Just Grow on Trees

By Troy Holcomb, DNR Forestry

I'm guessing we all have a picture in our head of Jonny Appleseed traveling the countryside, planting apple trees everywhere he went. While life may be a bit different now compared to the early 1800s, reforestation is still just as important and is occurring all over the place. But just like money, trees don't just grow on trees. They have to come from somewhere…right?

Timber harvests are part of our local economic engine, creating revenue and jobs and providing wood and paper products as part of our daily lives. They can also be necessary to remove some trees for the health of others or to maintain wildlife habitat. About 40,000 acres of woods are harvested on State land across Minnesota each year. Ten thousand or so of those acres are pine or hardwood thinnings that don't require regeneration. Close to 20,000 acres regenerate naturally by sprouting back from roots or stumps. The balance (8,000-10,000 acres) is either planted or seeded to grow a new forest.

The seeds that we use to grow our next generation of forests are purchased by the DNR Division of Forestry from private individuals—"pickers"—and sent to the State Forest Nursery in Akeley. Nursery staff take native tree seeds and cones through a meticulous multi-step process to extract clean, high quality seed. The seeds are then stored in coolers through the winter to assure viability in the spring. On an average year, we are buying approximately 2,500 bushels of seeds and cones from the public. We use them to grow 2.5-3 million seedlings each year. They are planted on public lands and sold to landowners across the state. We also produce about 600 pounds of pure seed for seeding projects annually.

As an example, one of our most in-demand species for aerial seeding is black spruce. State and County forestry agencies typically need to seed 3,000-4,000 acres of lowland black spruce each year across Northern Minnesota. One bushel of black spruce cones will yield only 4-6 ounces of viable seed. That means we need to buy approximately 500-1,000 bushels of black spruce cones each fall!

Does it seem like quite the production? It is significant for several reasons. To manage our forests sustainably, we need to be able to grow trees where we harvest to maintain habitats and have trees for society to harvest in the future. The old adage of planting two trees for every one we harvest is true. We are also able to control the source and final destination of our stock to ensure the trees grow well. Solid reforestation practices are one of the reasons we are able to maintain third party certification from the Sustainable Forestry Initiative and the Forest Stewardship Council.

As you can see, reforestation is an important challenge. But the most important part is you! We are projecting that the demand for seedlings is going to increase. We are having a harder time buying seeds and cones due to labor demographics. Price per bushel recently increased for black spruce and tamarack. If this seems like something you would like to contribute to, or if you're looking for some extra cash, stop into your local DNR Forestry office to learn more or maybe even earn yourself a nickname like "Jonny Sprucecone."

Black spruce cones are trayed in a cone shed. Once an area office purchases seed or cone, they usually come to the nursery in burlap bags and are then transferred to trays in 1.3 bushel amounts to prevent heating, molding, and spoilage. Once cones are trayed, staff can open and close them with watering and heat in a kiln room to loosen the seeds. This is the alternative to using the extractory oven to open cones (see below).

Black spruce is running through an "extractor," which is a large oven that heats the cones and allows them to open and release seeds. This is mostly used for seratinous cones (jack pine), but sometimes black spruce cones are opened this way as well. This is what the end of the oven run process looks like. Cones are collected in a large hinged box. Cones are shoveled to disperse them evenly throughout the box.

The open cones that just came out of the oven are dumped into a large hopper attached to a conveyor. The cones travel up the conveyor and into a large tumbler, then work their way through the tumbler and release seeds into hoppers under the machine. The cones come out of the far side.

Once seed is collected from the tumbler, nursery staff work to remove the small wings from the seed. They have specialized concrete mixers that are used to dewing the seeds. A specific amount of seed is added to a dewinger, along with water, and spun in the mixer (dewinger) for two or so hours. Time and water amounts vary with each species. Black spruce is usually a half bushel, with four cups of water, and run for two hours. Sometimes, staff add empty cones of the same species to the mixer to aid in seed wing removal.

After seed comes out of the dewinger, it is collected and run through the fanning mill. The fanning mill removes finer debris, such as loose seed wings, needles, empty cones, sticks, etc. by letting the seed fall out of the red hopper. Once seed is let out of the hopper, it falls through the screen to the bottom of the machine. The top catches the larger debris by moving down the screen and off the top of the machine into a shoot, then, a tub collects the debris.

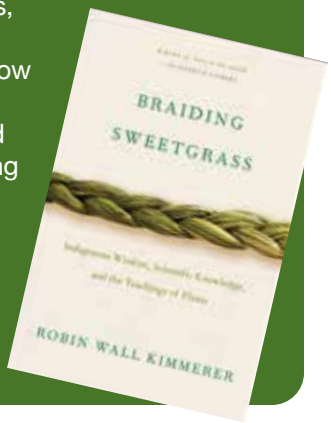
Inside the machine, there is a finer sized screen that gets rid of smaller debris that was similar in size or smaller than the black spruce seed and fell through the top screen. Screen size is species-dependent. The seed comes out directly behind the machine and is collected in a metal tub.

Our Shared Bookshelf

Each issue, we'll be selecting a favorite book to share with our readers to help build community and encourage the sharing of resources. If you'd like to submit a recommendation for Our Shared Bookshelf, please email Editor@MinnesotaForestry.org. We look forward to hearing about what everyone is reading and enjoying!

This edition, we're highlighting *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants*.

As a botanist, Robin Wall Kimmerer has been trained to ask questions of nature with the tools of science. As a member of the Citizen Potawatomi Nation, she embraces the notion that plants and animals are our oldest teachers. Kimmerer shows how other living beings—asters and goldenrod, strawberries and squash, salamanders, algae, and sweetgrass—offer us gifts and lessons, even if we've forgotten how to hear their voices. In reflections that range from the creation of Turtle Island to the forces that threaten its flourishing today, Kimmerer circles toward a central argument: that the awakening of ecological consciousness requires the acknowledgment and celebration of our reciprocal relationship with the rest of the living world.



Snapped

Have a fun picture you've captured that you'd like to share? Submit images to Editor@MinnesotaForestry.org.

Turkey tails captured by Kassandra Tuten, Editor.

Ecosystem Feature: Bog

By Kassandra Tuten, Editor, and Ryan Heiderman

A bog is a type of wetland ecosystem characterized by wet, spongy, poorly drained peat-rich soil. Bogs can be divided into three types: (1) typical bogs of cool regions (like Minnesota), dominated by the growth of bog mosses—sphagnums—and heaths; (2) pocosins, or evergreen shrub bogs, of the Southeastern United States; and (3) tropical bogs, or tropical tree bogs, in which the peat may be formed almost entirely from tree remains.

Bogs occur where the water at the ground surface is acidic and low in nutrients. They derive most of their water from precipitation rather than mineral-rich ground or surface water. Water flowing out of bogs has a characteristic brown color, which comes from dissolved peat tannins. In general, the low fertility and cool climate result in relatively slow plant growth, but decay is even slower due to low oxygen levels in saturated bog soils.

Bogs have distinctive assemblages of animal, fungal, and plant species, and are of high importance for biodiversity, particularly in landscapes that are settled and farmed. Most inhabitants of bogs are capable of tolerating the combination of low nutrient levels and waterlogging.

Bogs are typically dominated by hummocks of sphagnum moss, with scattered shrubs such as leatherleaf (*Chamaedaphne calycylata*) and Labrador tea (*Ledum groenlandicum*). There may be a few stunted trees, such as black spruce or larch as well. Blueberries, cranberries, cloudberries, huckleberries, and lingonberries are all also harvested from bogs. Because bog waters have very few nutrients to support plant growth, carnivorous plants such as sundews and pitcher plants are also common, using invertebrates as a nutrient source.

Bogs are recognized as a significant/specific habitat type by a number of governmental and conservation agencies. They can provide habitat for mammals such as caribou, moose, and beavers, as well as for species of nesting shorebirds. Bogs can also contain species of vulnerable reptilians such as the bog turtle. Bogs even have distinctive insects, and in North America are habitat for the bog copper butterfly (*Lycaena epixanthe*).

A bog with black spruce among other plants. Photo by MNDNR.

While serving as a unique and important habitat, bogs are also valuable for other reasons, including tourism and outdoor recreation uses, industrial uses, and more.

Peat in bogs is also an important place for the storage of carbon. Bogs and peatlands account for about one third of the earth's carbon storage, but only cover 3% of the earth's surface. If the peat decays, carbon dioxide would be released to the atmosphere, contributing to global warming. Undisturbed, bogs function as a carbon sink. Many of the bogs in Minnesota have been accumulating materials since the last ice age, making the deepest carbon in these bogs close to 10,000 years old.

Did you know? In Northern Minnesota, there is the SPRUCE project, an experiment to assess the response of northern peatland ecosystems to increases in temperature and exposures to elevated atmospheric CO_2 concentrations.

A bog with black spruce, larch, and more. Photo by MNDNR.

Creature Feature

By Kassandra Tulen, Editor

Red-winged blackbird

Red-winged blackbirds (*Agelaius phoeniceus*) are stocky, broad-shouldered blackbirds with a slender, conical bill and a medium-length tail. They often show a hump-backed silhouette while perched; and males often sit with their tail slightly flared. They are closely related to orioles, bobolinks, meadowlarks, grackles, and other American blackbirds.

The red-winged blackbird is named for the male's plumage, which is mostly black, with a blaze of red and yellow on each wing. The female is smaller than the male, with no black feathers. Her brown plumage is striped with beige, and above her eyes is a pale mark that resembles an eyebrow. Female red-wings also have rusty brown epaulets that become brighter with age.

The red-winged blackbird is territorial, polygynous, gregarious, and a short-distance migratory bird. Its way of flying is characteristic, with rapid wing flaps punctuated by brief periods of gliding flight.

Male red-winged blackbirds like to get noticed, sitting on high perches and belting out their conk-la-ree! song. Females stay lower, skulking through vegetation for food and quietly weaving together their remarkable nests.

Red-winged blackbirds nest across North America, from Southern Alaska to Mexico, Costa Rica, and the Bahamas. In Minnesota, they are among the most common and familiar songbirds. They roost in flocks in all months of the year. In summer, small numbers roost in the wetlands where the birds breed. Winter flocks can be congregations of several million birds, including other blackbird species and starlings. Each morning, the roosts spread out, traveling as far as 50 miles to feed, then re-form at night.

Look for red-winged blackbirds in fresh and saltwater marshes, along watercourses, water hazards on golf courses, and wet roadsides. In winter, you can find them in crop fields, feedlots, and pastures.

Like many birds, red-winged blackbirds usually migrate between southern wintering grounds and northern nesting sites. Individual red-wings seem to return to the same places year after year. Male red-wings arrive in Minnesota before most other songbirds, and females arrive after males have divided up the habitat.

Barely an inch long, red-winged blackbird eggs are pale green with purple or brown splotches. After hatching, the mother takes care of the babies and hunts for their food. Males fearlessly attack minks, hawks, crows, and other animals (including horses and humans) that pose a danger. The chicks' eyes open within a week of hatching. Two weeks after hatching, they are ready to fly.

The red-winged blackbird is omnivorous. It feeds primarily on plant materials, including seeds from weeds and waste grain such as corn and rice, but about a quarter of its diet consists of insects and other small animals such as dragonflies, damselflies, butterflies, moths, flies, snails, frogs, eggs, carrion, worms, spiders, and mollusks. In season, they also eat blueberries, blackberries, and other fruits. In late summer and in autumn, the red-winged blackbird will feed in open fields, mixed with grackles, cowbirds, and starlings in flocks which can number in the thousands.

Top: Male red-winged blackbird displays bright red patches on wings.

Bottom: Females are striped brown and beige.

Did you know? The oldest recorded red-winged blackbird was 15 years, 9 months old. It was banded in New Jersey in 1967, and found alive but injured in Michigan in 1983. It was able to be released after recovering from its injuries.

Upcoming Events

Find more events, and more information on these events, at the MFA website, www.MinnesotaForestry.org,or by calling MFA at 218-879-5100.

MAY

Fridays with a Forester: Family-Friendly Earth Care

9 a.m. Friday, May 13, Online

This online discussion series provides research-based information about some of the current topics being discussed in Minnesota forests and woodlands. Learn more and register at https://www.minnesotaforestry.org/events/fridays-with-a-forester-wildlife-on-your-property-47mmn-crnzg-2xa63-23zt6-9xe47.

Wabasha Forestry Day 2022

9 a.m. to 3:30 p.m. Friday, May 20, Kellog

Attend Wabasha Forestry Day 2022. Learn more and register at https://www.minnesotaforestry.org/events/wabasha-forestry-day.

Gathering Partners Conference

Friday, May 20 - Sunday, May 22, Treasure Island Resort & Casino

Attend the Gathering Partner Conference, a conference for friends of Minnesota's natural resources. Learn more and register at https://www.minnesotaforestry.org/events/gathering-partners-conference-1.

JUNE

Silvopasture, Oak Savanna, Adaptive Grazing Field Day

8:45 a.m. to 3 p.m. Thursday, June 2, Oak Savanna Learning Center, 16797 289th Ave. NW Zimmerman, MN 55398

SFA's Silvopasture and Grazing specialists will be co-hosting the event with a cohort of UMN researchers and Sherburne National Wildlife Refuge staff to share the results of the research at the refuge on using targeted grazing impact for vegetation management and restoration of oak savanna. There will be additional overview on oak savanna history, restoration and management, as well as discussion and demonstration of adaptive grazing management and prescribed fire. Some hands-on training will be offered. Learn more and register at https://www.minnesotaforestry.org/events/silvopasture-oak-savanna-adaptive-grazing-field-day.

Minnesota Forestry Association

PO Box 6060
Grand Rapids, MN 55744

www.MinnesotaForestry.org

Change Service Requested

Join the My MN Outdoor Adventure Campaign

Celebrate the diversity of Minnesota's outdoor spaces and opportunities for adventure by sharing your story through the My MN Outdoor Adventure campaign, which seeks to empower diverse outdoor enthusiasts to find their personal connections to Minnesota's outdoor spaces and places and share them with others.

To submit your story for the campaign, fill out and submit the form at https://www.dnr.state.mn.us/aboutdnr/outdoor-adventure/index.html.

You can also tell your story on social media—be sure to use the hashtag #MyMNOutdoorAdventure—and tag @MinnesotaDNR on Facebook, @MinnesotaDNR on Instagram, and/or @mndnr on Twitter.