

Minnesota MFA Woodlands

Minnesota Forestry Association

www.MinnesotaForestry.org

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

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MFA Board Meetings
DNR Cambridge Office
10 a.m. – 3 p.m.
• January 12, 2021
• April 13, 2021
*Subject to change
due to COVID-19*

Conference Calls
8 – 9 a.m.
• December 8, 2020
• February 9, 2021
• March 9, 2021

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Lidar Forest Inventory at the Minnesota DNR-Division of Forestry

By Scott Hillard Ph.D., Dennis Kepler, and Jennifer Corcoran Ph.D.

In forestry, inventory is the foundational dataset providing critical information on the resources of that forest (at varying scales), often informing the type and timing of forest management activities. Imagine a store: suppose a client comes to a shelf and does not see something they expect to find, so they ask the clerk if they have any in stock. The clerk's reply will depend on how well they understand what the store is carrying. Imagine now that there is no inventory of the goods in that store; how informed will that clerk sound? How likely is the client to come back? Bringing this back to forest management, you literally cannot manage resources that you do not know are there, like the old adage says, "You cannot manage what you cannot measure." In short, inventory matters.

Inventory is expensive. Everyone involved in forestry understands the value of inventory; due to the cost, it often takes a back seat to other concerns involved in forest management. The Minnesota Department of Natural Resources Division of Forestry (MNDNR-DOF) manages approximately 2.75 million acres of commercially viable timberlands. However, by the time you factor in all of the forest lands (woody bogs, other low productivity places where trees are growing, state parks, etc.) that figure jumps to 4.2 million acres. Currently, inventory costs six to eight dollars an acre for a traditional prism cruise through a stand. MNDNR-DOF faces problems familiar to all landowners when collecting inventory: managing a huge resource with not enough time, personnel (employees and contractors) and not enough money. Meanwhile, the demands for wood fiber from state lands to supply mills as well as non-timber resources (wildlife habitat, carbon, recreation) are increasing.

Lidar and Remote Sensing for Forest Inventory

Light detection and ranging, or lidar, is a laser scanning technology that measures the time it takes for a laser pulse transmitted from a sensor to return, providing a very precise estimate of elevation. This can be applied to an uneven surface (such as a forest canopy) providing a 3D view of the forest (figure 1). From here, a fair bit of statistics and modeling is involved, but the goal is to relate information derived from the lidar data to the forest metrics that are collected in the field (more on this below).

To meet the challenge of inventorying more area and at a reduced cost, the MNDNR-DOF Resource Assessment (RA) program designed a pilot research project in 2016. RA was successful in a grant application through the Legislative-Citizens Commission Minnesota Resources (LCCMR), receiving an Environment and Natural Resources Trust Fund (ENRTF) grant.

Continued on page 6

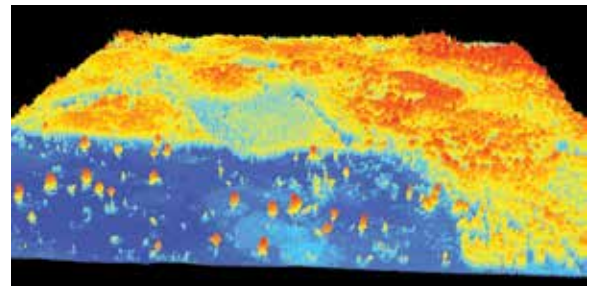


Figure 1: A lidar point cloud colored by elevation above ground.

Minnesota Forestry Association

2020 Board of Directors

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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!
Information@MinnesotaForestry.org
or call 218-879-5100

From the President

As the current president of MFA, I would like to share a few thoughts about myself, your current board and the near future of the Minnesota Forestry Association.

My name is Dave Roerick. I live in Grand Rapids and I have been retired for 12 years, after a 35-year career with the U.S. Forest Service. I manage several parcels of timber land in Northern Minnesota and enjoy our great outdoors, tinkering in the woods.

As your president for about the past year and a half, I have been encouraging our board to be more engaged in serving our membership. This led to inviting our executive committee to our Cloquet office last summer to visit with Rachel and Chris about our current state of affairs and what needs improvement.

Because of an aging computer, your board took action last month to move MFA membership tracking to a more efficient QuickBooks program with an accounting business in Grand Rapids that has been handling our financial business for the past year.

Because of this significant change, the Minnesota Logger Education Program (MLEP) Board of Directors took action at their last board meeting to terminate the agreement of providing service to MFA.

As we transition to the future, we will again use Grand Rapids as our homebase. Effective Jan. 1, 2021, the new mailing address for MFA will be PO Box 6060, Grand Rapids, MN 55744. Also effective on Jan. 1, you will be hearing my voice when you call the MFA phone number. This change will allow our board to be more in touch with our membership.

We look forward to working with MLEP any way we can to promote a healthy logging community and landowner partnership.

As we all know and understand, this pandemic is playing a significant role in how we manage our lives. MFA is in the same boat. Because of COVID-19, the board also took action to not have a change in officers or board members for fiscal year 2021, so you will not see an election ballot in the newsletter. We look forward to serving you the best we can, under the circumstances.

Please feel free to contact me anytime. My contact information is to the left in the Board of Directors box.

Best wishes for the upcoming holiday season.

Your president,
Dave Roerick



Dave Roerick

New Resource on Climate Change for Minnesota's Forests Is Available

The Minnesota Forest Resources Council (MFRC) recently published a report entitled *Climate Change and Minnesota's Forests*. This report was developed and written in coordination with the Research Advisory Committee of the MFRC and focuses on likely climate change outcomes in Minnesota and its effect on our forests and forest management; opportunities to increase carbon on the Minnesota landscape and mitigate fossil fuel emissions; and adaptive forest management strategies to maintain our iconic forests on the landscape in the face of a changing climate.

The report concludes by providing several possible actions or policies that can be supported in order to prepare Minnesota's forests for our climate change future. The full report is available to download at <https://mn.gov/frc/>.

Forest Stewardship

From Minnesota DNR

The DNR Forest Stewardship Program helps woodland owners manage their woods through advice and education, cost-share programs and Woodland Stewardship Plans. A statewide network of DNR, public and private foresters specially trained in forest stewardship are ready to help you achieve your woodland goals, whether it is to create wildlife habitat, increase natural beauty, improve trails, enhance environmental benefits or harvest timber.

Managing Your Woods

Forest management is all the things you do to keep your woods healthy and beautiful. This work tends to happen in small steps over multiple years. For example, if you want to improve wildlife habitat, you may need to remove invasive plants to allow native plants to grow, and then plant the right trees to increase food for wildlife. After a time, you may need to remove some trees to decrease competition between trees and increase the health of the remaining trees. These actions make your woods attractive to wildlife and also provide environmental benefits. Woodland Stewardship Plans help you organize and complete all of these steps.

Woodland Stewardship Plans

A Woodland Stewardship Plan helps you understand what is in your woods, how to improve them and when to do work. A unique plan is developed for your woods based on your land management goals. The plan can help you stay on track over the long-term and keep your woods healthy and beautiful. Plans are written for woodland owners with 20 to 5,000 acres where at least 10 acres have or will have trees. Plans are updated every 10 years to stay current with your needs and your woods.

Plans are developed and written by foresters trained in woodland stewardship from the DNR, environmental organizations, Soil and Water Conservation Districts and consulting foresters. The cost for a Woodland Stewardship Plan depends on who writes it and the size of your woods.



While a DNR forester can write your plan, you can also hire another stewardship forester to do the work. Check out the interactive map of approved Minnesota Woodland Stewardship Plan writers at <https://sfec.cfans.umn.edu/continuing-education-credits>.

Financial Benefits of a Woodland Stewardship Plan

A Woodland Stewardship Plan registered with the DNR qualifies you for woodland tax and financial incentive programs.

Cost-Share Program: The DNR has cost-share funds available to help woodland owners complete projects to improve their woods (these are the steps outlined in your Woodland Stewardship Plan). A DNR forester works with you to develop a project plan. Project work can be done by you or a contractor.

Incentive Programs: The Minnesota Sustainable Forest Incentive Act (SFIA) jointly managed by Minnesota Department of Revenue and DNR is an incentive program to keep forests as forests on our landscape. Landowners with at least 20 acres of forest land under a registered Woodland Stewardship Plan may be eligible.

Minnesota offers a reduced property tax rate called 2c Managed Forest Land. Woodland owners who actively follow their registered Woodland Stewardship Plan may be eligible for a reduced property tax rate of .65%.

Learn more at <https://www.dnr.state.mn.us/foreststewardship/index.html>.

The Forest Stewardship Program is funded by the USDA Forest Service and run by the Minnesota Department of Natural Resources.



UNIVERSITY OF MINNESOTA EXTENSION

For MFA members, the two best online sources of woodland information are the MFA website at minnesotaforestry.org, and the University of Minnesota Extension Forestry website at myminnesotawoods.umn.edu.

Get Involved with MNWWN

By Barb Spears, President MNWWN

The Minnesota Women's Woodland Network (MNWWN) offers women woodland owners, and others who are interested in woodland stewardship, the opportunity to connect through geographically local networks. There are currently two active local networks located in the Metro Area and in the Northeast.

The Metro Area MNWWN members meet quarterly to discuss a topic related to woodlands and natural resources. Past topics include forest health, woodland care and management, conducting a timber harvest, using goats for vegetation management, restoring woodlands after buckthorn, etc. The Metro Area MNWWN has hosted hands-on workshops such as women's chainsaw safety and maintenance, tool sharpening, growing mushrooms, tree and native plant ID walks, tours and even a book club featuring women nature writers. Please contact Barb Spears at metro@mnwwn.org or 651-328-0463 for more information.

The Northeast MNWWN is a mixture of women landowners and area natural resources professionals. The area served by the Northeast MNWWN includes the counties of Cook, Carlton, Pine, Lake and St. Louis. This local network does not meet regularly but hosts field events and other activities and shares information through email. Please contact Jan Bernu at northeast@mnwwn.org or 218-879-4433.

There are other local networks needing enthusiastic women to connect with others to learn from and share experiences in woodland care. The MNWWN can help get these local networks started. Please contact the MNWWN at info@mnwwn.org to learn how to get involved locally.

Follow MNWWN on Facebook at facebook.com/MNWWN and on Instagram at [@MNWWN_](https://instagram.com/@MNWWN_).



Barb Spears (top) and Jan Bernu (bottom).



Jan Bernu teaches MNWWN participants about stewardship and woodland management.

MFA's
Forester Phone Line
A free service for MFA members only!
Call for an appointment with
the forester: 218-879-5100

Dear Editor,

I am an MFA member and attended the recent conference. The video presentations were a god-send for my work in restoring our little section of the Big Woods. I have watched some of the presentations multiple times and will continue to do so as long as they are available online. I am very busy in the woods this time of year and have limited time to study the sessions. Please extend the access to these videos so that I may continue to study them. This was the best set of speakers I can remember of any meeting in the past. Great job!

John H Peterson

Delano, Minnesota

Farm Transition and Estate Planning: Create Your Farm Legacy

From University of Minnesota Extension

Farm Transition and Estate Planning: Create Your Farm Legacy provides farm families with the tools and skills to move forward with developing their farm business transition and personal estate plans.

Workshops

Learning objectives for the one-day workshop:

- Establish individual, family, retirement and business goals as the foundation to the transition process.
- Understand farm business transition strategies and examples including business entities.
- Understand the need for determining the financial viability of the business.
- Understand tax issues in the transition process.
- Identify estate planning issues and strategies, including identifying a transition and estate planning team.

Retreats

Also offered are one-and-a-half-day retreats that focuses on both transferring the financial business and transferring the management and responsibility of the farm business. The retreat is designed to be attended by both the entering generation and retiring generation involved in a farm. It allows time for significant planning and discussion within the farm family.

“The retreat is a wonderful opportunity for families to help start the conversation needed to transition farm operations,” said a past participant.

This project is a partnership of Minnesota State College and Universities and UMN Extension. Funding support comes from the Minnesota Department of Agriculture.

For questions about the workshops or retreats, please contact Amber Roberts, Extension educator, at amberr@umn.edu. For registration assistance, please contact Katie Carr at katiec@umn.edu or 612-624-7182.

Upcoming events

**Farm and land transition series:
Business structure and land ownership**
Thursday, December 3, 2020, 12-1 p.m.
Webinar series

**Farm and land transition series:
Wills and trusts**
Thursday, December 10, 2020, 12-1 p.m.
Webinar series

**Farm and land transition series:
Selling and gifting assets**
Thursday, December 17, 2020, 12-1 p.m.
Webinar series

**Farm and land transition series:
Business succession**
Thursday, January 7, 2021, 12-1 p.m.
Webinar series

**Farm and land transition series:
Retirement planning**
Thursday, January 14, 2021, 12-1 p.m.
Webinar series

**Farm and land transition series:
Without a successor**
Thursday, January 21, 2021, 12-1 p.m.
Webinar series

Multi-generation farm transition planning
Thursday, February 4, 2021 - Thursday, February 25, 2021
12-1 p.m.
Webinar series

Multi-generation farm transition planning
Friday, March 12, 2021 - Saturday, March 13, 2021
Alexandria Tech and Community College



Lidar Forest Inventory continued

The purpose of this grant was to investigate the use of high-density lidar for forest inventory and test several field inventory plot system designs. Partnering with the U.S. Forest Service and Cass County, RA acquired both lidar and field data to create and evaluate forest metrics on over 1,000,000 acres of forestland across all ownerships in two different study areas in Cass and Lake counties. The final report submitted to the LCCMR is available at <https://www.lccmr.leg.mn/>. RA has also presented the results of this work at several national and regional conferences (including at MFA's Annual Meeting in Cloquet in October 2019), and several peer-reviewed journal articles are in the works.

The project resulted in a wall-to-wall, all ownership, stand-level inventory in the pilot study areas, with an estimated cost savings of 50% over traditional methods. RA produced 20m gridded raster datasets and stand level estimates (i.e., polygons) of total height, average height, quadratic mean diameter, basal area per acre, volume per acre, above ground biomass per acre, forest cover type, site index, stand age and trees per acre (see examples, figure 2).

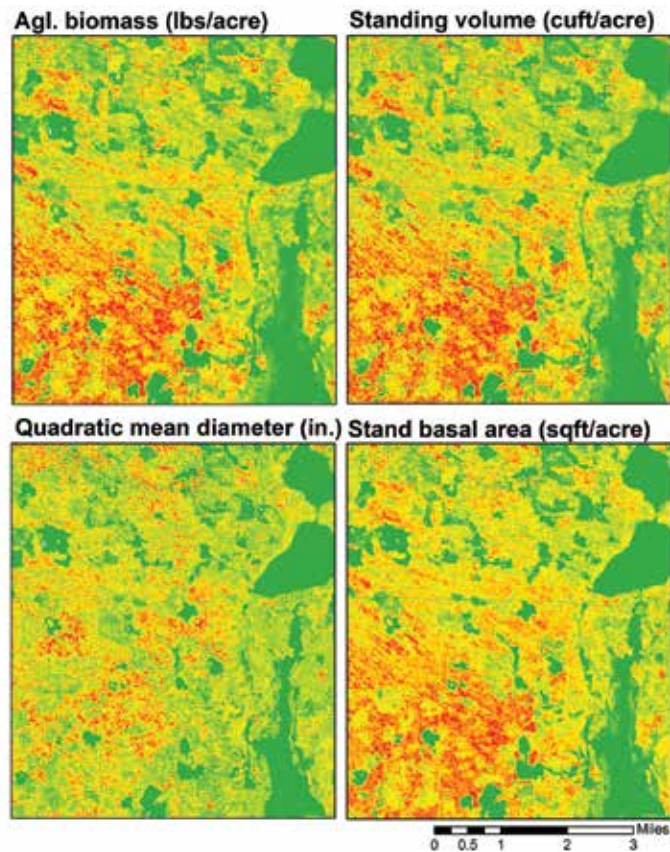


Figure 2: Four example maps showing the forest inventory model results of above ground biomass, standing volume, quadratic mean diameter at breast height and stand basal area for a small area in Cass County. Red

Not Just Forest Inventory

Lidar is a very powerful tool, and we have only begun to scratch the surface and see the possibilities. In addition to forest inventory, we can derive many useful products and even play detective to understand the scope of past harvests, or other disturbance events. Figure 3 shows a canopy

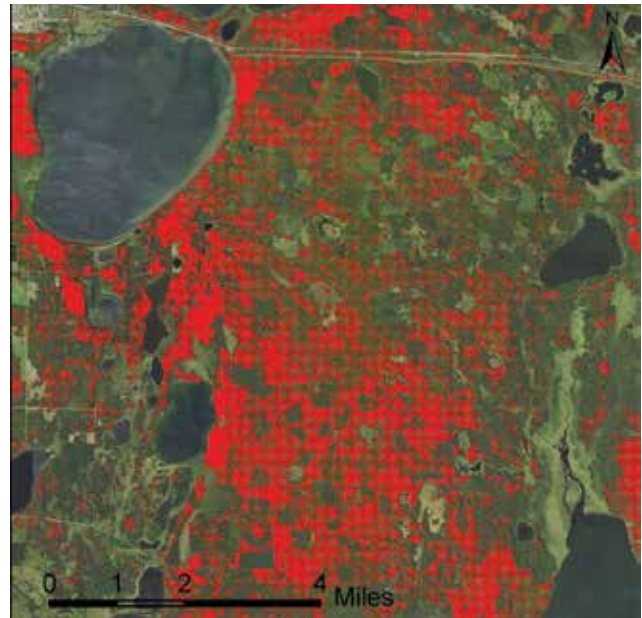


Figure 3: Comparison of canopy change between two separate lidar collects (2011, 2017) demonstrating the ability to derive other important forest information such as past disturbance. Red areas show change in the canopy heights between two collection dates.

difference map produced by subtracting canopy height maps derived from two different lidar collection dates (2011 and 2017). In this map, the red “streaks” across the map are clearly visible as areas where the height changed from one collect to another. This shows where blowdown occurred; likewise other canopy disturbance events, such as harvest, are easily deducible from this data (including growth).

In addition to detecting forest change, RA has collaborated with researchers from the Division of Fish and Wildlife to find highly probable areas for wood duck nesting sites by using the data to determine vegetative structure. Water resources benefit as well; the high-resolution digital elevation models produced from this lidar can aid in hydrologic modeling, which is vital to a number of agencies, programs and research groups concerned with water resource quality.

Next Steps

RA is currently working to expand remote sensing-based forest inventory across Minnesota. RA is collaborating with the USGS 3D Elevation Program (3DEP), counties, USFS, Natural Resource Conservation Service, Department of Transportation and emergency management organizations to collect lidar data across 10 million acres in Northeastern Minnesota as part of the first phases of a statewide plan, in an area called the Rainy Lake and Lake Superior Blocks. The Rainy Lake project has secured funding with field inventory data currently being collected and lidar acquisition in spring 2021; Lake Superior Block is in the planning stages for the same timeframe. Details of the organized efforts to fund and acquire high density lidar data can be found at the MN Geospatial Advisory Council's 3DGeomatics website (<http://www.mngeo.state.mn.us/committee/3dgeo/>), including the phased Minnesota Lidar Plan to collect high density lidar statewide.

What is available to landowners and how can they support this effort?

The MNDNR has long been involved in supporting private forest management and shared stewardship initiatives with private (both corporate and family) landowners. Now more than ever we need to think of the total forest, and how a 2,000 acre parcel or even a 40 acre parcel plays into the natural resources of the landscape. Previously, everyone operated in a silo, with no one really sure what the forest looked like beyond their borders. This new type of forest inventory allows us to see the lands all around us, and manage more holistically.

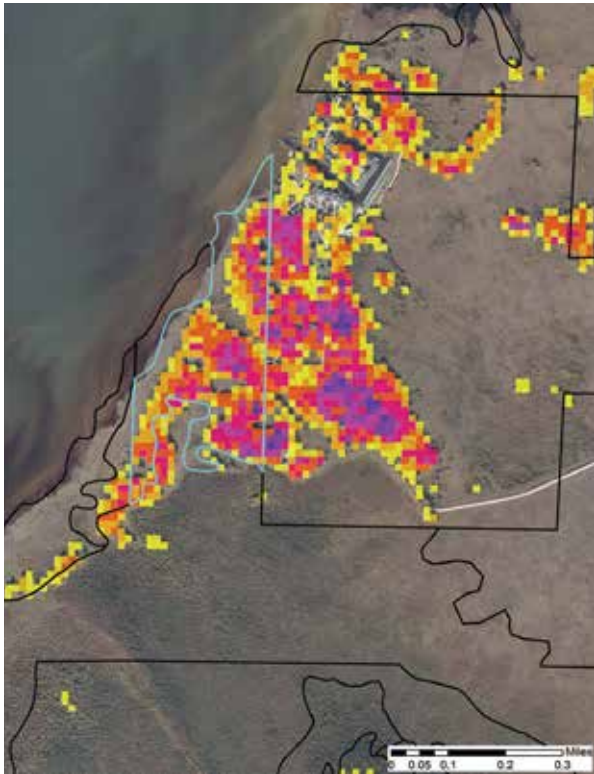


Figure 4: Estimated volume; darker areas are higher volume. The black borders show state land boundaries. Lidar allows us to see what is on adjacent stands; likewise this data can allow private landowners to see what is around them and coordinate with others when planning forest management projects.

Figure 4 shows a MNDNR stand (outlined in cyan) and an adjacent privately owned stand. Before, there were many barriers to coordinating management between the two stands. With the availability of lidar derived inventory, both landowners and administrators can speak the same language and share common data. There will be no need to reconcile two out-of-date inventories, maybe done with different techniques and varying error. With lidar, the inventory is the same and the conversation on the best course of action can begin.

Currently, the coverage of this data is small relative to the entire state, existing in a few areas in Cass, Lake and now also Pine counties. As more areas are covered, we envision being able to make data available to those participating in management programs. For private landowners not participating in stewardship agreements through the MNDNR, we encourage coordination through groups and organizations to pool resources to aid in acquiring and processing lidar and field inventory data. At RA, we pull together a variety of funding sources to entice the USGS-3DEP program to fund these lidar acquisition projects. Showing interest on the part of multiple groups is vital to the success of these grant funding applications. This will be especially important as we move further south in the state and the proportion of public land is reduced; coordination with private forest landowners will be critical.

RA continues to innovate and rely on the latest research methods to improve and enhance the state's forest inventory. RA's staff provides the data needed to manage not just state administered forests, but the total forest landscape.

With mill closures, softening of traditional fiber markets and the rise of value in non-fiber resources (carbon, wildlife habitat), coordination between multiple landowners and administrators is more critical than ever to entice new investment and conservation projects to the state. By understanding your forest resources through accurate inventory, like the clerk in the store, you can speak with authority about "what you have in the warehouse" in a way that will encourage businesses to stay or come back. For RA's part, we encourage folks, especially on private lands, which make up nearly half of the total forest land acres, to get involved in helping to bring innovative approaches to forest inventory to the state. Minnesota has a well deserved reputation for forward-looking forest management on the part of all stakeholders, but especially its private forest managers and owners. With all the challenges we face, this reputation is not guaranteed into the future, and it means we all must look for ways to improve our data collection, so we can all turn that information into a healthy forest, sustaining all of the uses we cherish here in Minnesota.

Contacts at Resource Assessment

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Assess the Health of Your Woodlot with New App

Use the new Healthy Woods app to quickly and easily identify common health issues in your woodland. You can also learn more about forest health using the educational resources in the app. Learn more at <https://healthywoodsapp.org/#getting-started>.

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.

Webinar: Forest Carbon and its Role in Greenhouse Gas Removals and Emissions

Tuesday, December 15, 12-1 p.m.

Speaker: Grant Domke, USDA Forest Service, Northern Research Station

Cost: \$20 per webinar or \$50 for the entire 2020 series

This presentation will discuss how forest inventory and analysis data and auxiliary information such as remotely sensed data are being used to estimate forest carbon for greenhouse gas reporting. Learn more at <https://www.eventbrite.com/e/2020-sfec-umn-extension-forestry-webinar-series-registration-72744477691>.

MNWWN/Minnesota State Horticultural Society Habitat Restoration Webinar Series

MNWWN board member and owner of Landscape Restoration, Inc., Cheryl Culbreth presented on three topics for the recent habitat restoration webinar series: battling buckthorn, getting rid of garlic mustard and dealing with oriental bittersweet. The recorded webinars are available for \$8 each online at <https://northerngardener.org/webinar-archives/>.

Minnesota Woodland Owner Weekend

The Minnesota Woodland Owner Weekend event recording is now available through MSHS for \$40. As with the Habitat Restoration Webinar Series, webinar revenue is split 50/50 by MSHS and MNWWN (MFA receives 10% of MNWWN revenue). Learn more at <https://mshs.z2systems.com/np/clients/mshs/product.jsp?product=89&>.

Visualizing Invasive Plants: New Story Maps and Lifecycle Graphics

The Minnesota Department of Agriculture has released new StoryMaps and lifecycle graphics for common invasive plants in the state. Explore the website at <https://tacticalplan-mnag.hub.arcgis.com> to see maps of where the invasive plants are found and lifecycle graphics showing stages of plant growth and management strategies.



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Change Service Requested

A word from the editor:

As this challenging year comes to a close, I want to extend gratitude to you, our loyal members. I, and MFA, look forward to continuing to work on behalf of family forest owners and, through education and advocacy, promote wise stewardship of forest lands. As always, I want to encourage you all to reach out to me with ideas, thoughts, suggestions, concerns and more.

May your holiday season be safe and joyous.

Warmly,
Kassandra Tuten, Editor

