

Minnesota MFA Woodlands

Minnesota Forestry Association

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

www.MinnesotaForestry.org

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MFA Board Meetings
DNR Cambridge Office
10 a.m. – 3 p.m.
• October 13, 2020
• January 12, 2021
Subject to change due to COVID-19

Conference Calls
8 – 9 a.m.
• November 10, 2020
• December 8, 2020
• February 9, 2021

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Oaks on the Decline from Variability in Growing Season Precipitation

By Rachael Nicoll and Brian Schwingle, Regional Forest Health Specialists

This year has been a tough year for all of us, including our oak trees. DNR foresters and the forest health team have fielded many calls this summer from concerned landowners in northwestern, central and southern Minnesota reporting dieback and mortality of their oaks.

This is not new, as we have been investigating areas experiencing abundant mortality or dieback of bur and red oak for several years. This year, some of the reported dieback has happened rapidly. On most sites, though, the decline in the health of these trees started before 2020. We refer to all of this death as “decline.”

What is oak decline, exactly? We use the phrase to describe progressive dieback and eventual death of oak trees from multiple factors over several years. Decline occurs when multiple factors such as severe drought, excess rainfall, soil compaction, tree age and pest and disease issues interact to damage trees. Older trees growing on dry sites with shallow soils or south-facing slopes, or wet sites such as edges of wetlands or depressions with poor drainage, are more easily weakened by drought, flooding, or defoliators. They also become more susceptible to pests and diseases. Twolined chestnut borer and Armillaria root disease usually deal the final blow to these stressed oaks, but the preceding year(s) of damage set the stage.

To illustrate, we documented large areas of bur and red oak death in central and south-central Minnesota starting around 2015. Much of this was due to the following:

1. drought late in the 2011 growing season, one of the top 10 driest on record for central and south-central Minnesota;
2. flooding early in the 2012 growing season, one of the top 10 wettest on record for east-central and central Minnesota;
3. drought late in the 2012 growing season, one of the top 10 driest on record for east-central, central, north-central and south-central Minnesota; and
4. Armillaria and twolined chestnut borer attacks on extremely stressed oaks.

Continued on page 3



Declining bur oak in Kandiyohi County from soil compaction, drought, excess rainfall and old age.

Take our Minnesota Woodlands survey on page 7 or on our website!

Minnesota Forestry
Association

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Minnesota's 2020 Regional and State Outstanding Tree Farmers of the Year

Modified from an article written by Jan Bernu that appeared in the September MNWWN Newsletter

Congratulations to two of our MFA and Minnesota Women's Woodland Network (MNWWN) members who were named Minnesota's 2020 Regional Outstanding Tree Farmers of the Year (OTFY). Becky Lourey was selected for Region 3 (Central Minnesota) — nominated by Jan Bernu, consulting forester and MNWWN-NE co-leader. Janet Erdman was selected for Region 4 (Southeastern Minnesota) — nominated by Alex Gehrig, MN DNR forester in Preston. The other regional winners are Jeff and Peggy Hyytinen for Region 1 (Northwestern Minnesota) — nominated by Gary Anderson, consulting forester; and Rich and Maureen Krsiean for Region 2 (Northeastern Minnesota) — nominated by Jan Bernu. From these four regional winners, Becky was selected as Minnesota's 2020 OTFY. Congratulations to all and especially to MNWWN and MFA members, Becky and Janet.



Becky Lourey



Janet Erdman

Ask a Forester: How can I estimate the age of my tree?

The Extension Forestry team recently received the following question from a homeowner: "We have a very old oak in our yard and we're wondering how old it is." There are a couple ways to find the age of a tree.

Foresters use an increment borer to extract a tree core from the stem and count the rings. This is the most common way and does not generally affect the tree.

The issue for this homeowner was that the tree was a large oak. Extracting a tree core would be the logical option, but we were hesitant to suggest this for the homeowner's yard tree. Plus, finding an increment borer big enough would be tough. The largest increment borer a Minnesota forester will

usually carry is a 12-inch borer which can core a two-foot diameter tree. Plus, we want to avoid doing any damage to oaks in the summer due to transmission of the oak wilt fungus.

Instead of coring the tree, a mathematical formula can be used to estimate the age of the tree. A recent post from Purdue University explains how to do this. As an example, a 24-inch diameter white oak would have a total age of 120 years. To get a better estimate of the tree's age, the post also explains an "urban forest factor" for open-grown trees that are found in yards. You can see the post online at <https://www.purduelandscapereport.org/article/how-old-is-my-tree/>.

Jack Pine Budworm Outbreak

By Megan O'Neil, Northwest Region Forest Health Specialist

Populations of jack pine budworm are typically cyclical, and we expect to see the next large outbreak between 2023 and 2025. But the Bemidji area is getting a taste of what is to come. Multiple foresters have reported jack pine stands showing clear signs of an outbreak. This could be the beginning of a population on the rise.

Jack pine budworm is a native Minnesota insect that primarily feeds on jack pine, but this pest won't hesitate to feast on other conifer species, such as white or red pine, if they are present in a jack pine stand.

In May, budworm caterpillars emerge and feed on male pollen cones. As the cones wilt, caterpillars move to young foliage to continue feeding for about six weeks. Pupation occurs in July or early August and moths emerge after about a week to mate and lay eggs. Caterpillars develop in two weeks and do not feed, but spend the winter in this stage and begin feeding the next May.

The first noticeable sign of attack is the browning of jack pine needles in early July. Caterpillars web new needles together to make a feeding shelter. They feed on old needles after new needles are gone, and what's left will turn reddish in a few days. Budworms defoliate shoots and buds, which leads to twig mortality. Light budworm outbreaks reduce tree growth and top-kill is common after an outbreak.

Be sure to keep your eye on your jack pine, and if you are seeing signs of budworm, plan to manage accordingly.



Close-up of a jack pine budworm.

Oak Decline continued

Drastic swings in precipitation damage roots, which can kill an oak outright or make it susceptible to diseases and pests over the following decade while it attempts to regrow its roots. Determining the cause of death in landscape-level decline is difficult, since there are several factors involved and symptoms don't appear immediately. Oak mortality in 2020 in north-central Minnesota is likely a result of the extremely dry growing season in early 2017, the seventh driest on record. In contrast, mortality in 2020 in south-central Minnesota is partly due to extremely wet growing



seasons since 2016, three of the wettest six on record from May through October.

Decline usually first appears as stunted leaves or dieback in the outer canopy. Epicormic sprouts grow out of the trunk or upper limbs. Decline is often slow, and the dieback or epicormics often go unnoticed. When Armillaria starts causing root disease or twolined chestnut borer infests the tree, death can happen quickly, as we have seen in some areas this summer.

Unfortunately, the damage is difficult to reverse once decline has progressed. Further, decline is difficult to prevent as extreme weather events are unpredictable and vary by location. If you see declining oaks in your yard, the best course of action is to water them only during droughts and properly mulch them. Otherwise, leave them alone: avoid watering, fertilizing, compacting the soil and applying herbicides under their canopies.

In forested settings, avoid harvesting for several years after a drought. During the growing season on wetter sites, operate heavy equipment only during frozen ground conditions to avoid stressing healthy trees, and remove oaks with dieback and epicormic sprouts during thinning operations.

Harvest after severe flooding and drought in 2012 created additional stress, causing decline in this northern red oak stand in northern Pine County.

Drier Spring, Summer Leads to Pheasant Rebound

Adapted from a press release from the MN DNR

Pheasant Index Exceeds 10-Year Average in Many Parts of the State

Pheasant numbers are booming compared to last year, with the Minnesota Department of Natural Resources' annual roadside pheasant survey showing a 42% increase in the state pheasant index from 2019. The survey also showed a 37% increase over the 10-year average, including a 146% increase over last year in southwestern Minnesota.

"The weather this spring and summer was favorable for pheasants and enabled more hens to raise chicks, which drove the increase," said Tim Lyons, DNR upland game research scientist. "We didn't get hit by spring snowstorms or heavy rainfalls like in 2019, and that really is what let hens nest earlier and be successful."

Though the spring was cooler than average, rainfall was at or below average across much of the state.

"Successful nests earlier in the breeding season also means that chicks will be in better shape going into the fall and winter, which can improve their odds of survival," Lyons said.

The peak pheasant hatch was approximately four days earlier than average this year.

Weather and habitat are the main influences on Minnesota's pheasant population trends. Weather causes annual fluctuations in pheasant numbers, while habitat drives long-term population trends.

This year's statewide pheasant index was 53.5 birds per 100 miles of roads driven. All regions of the pheasant range reported an increase in pheasant counts, with the southwest reporting the greatest increase — there, observers counted 90.5 birds per 100 miles, a 146% increase compared to 2019.

Habitat Factors

Conservation Reserve Program (CRP) acres in particular play a large role in providing habitat for pheasants in Minnesota. The program, authorized under the federal Farm Bill, pays farmers to remove environmentally sensitive land from agricultural production and restore vegetation that will reduce soil erosion, improve water quality and provide habitat for wildlife and pollinators.

The offering of a general sign-up in 2019 resulted in a net increase of approximately 10,000 acres in the CRP program. Additional habitat acres were temporarily protected through other federal and state set-aside programs. Other habitat was permanently protected through state easements, U.S. Fish and Wildlife Service acquisitions and by the DNR as wildlife management areas.

Monitoring pheasant population trends is part of the DNR's



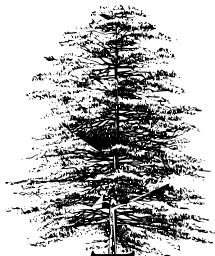
annual August roadside wildlife survey, which began in 1955. Wildlife managers and conservation officers in the farmland regions conduct the survey during the first half of August. This year's survey consisted of 169 25-mile-long routes, with 153 routes located in the pheasant range.

Observers drive each route in the early morning and record the number of farmland wildlife game species they see. The data provide an index of species abundance and are used to monitor annual fluctuations and long-term population trends of pheasants, gray (Hungarian) partridge, eastern cottontail rabbits, white-tailed jackrabbits, mourning doves, Sandhill cranes and white-tailed deer.

Call Before You Cut

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Meet a Tree **White Pine**

By *Kassandra Tuten, Editor*

Eastern white pine, *Pinus strobus*, is the largest conifer of the eastern and upper Midwest forests, reaching 150 feet in height and up to 40 inches in diameter.

In dense stands, trees produce tall, cylindrical stems with pyramidal shaped crowns, characterized by distinctive plate-like branching, especially noticeable as the trees become older. On young growth, the bark remains rather thin, smooth and greenish-brown in color. On older trees, the bark becomes deeply fissured and dark grayish-brown in color. White pine's evergreen needles are in clusters of five, soft, flexible, 2 1/2 to 5 inches long, and bluish-green in appearance. Its cones are about four to eight inches long and one inch thick. These remain attached for one to several months after ripening in the autumn of the second season.

Eastern white pine grows on a variety of soils ranging from light, sandy to heavy textured soils. It ranges across southern Canada, throughout the northern and eastern states from Minnesota and northern Iowa to the Atlantic coast, and southward along the Appalachian mountains to northern Georgia and Alabama.

The wood of white pine is light, durable and easy to work. Its timber is used for toys, boxes, cabinet work and similar items. White pine is also occasionally used in Christmas tree plantations and as ornamental planting in landscaping. It is frequently used for windbreaks and screens along fields, new right-of-ways and around campsites.

White pine has wildlife value: gray and red squirrels, deer, mice and 16 species of songbirds have been known to eat the seed.

The white pine weevil is the tree's greatest insect pest, affecting both timber quality and volume. The white pine cone beetle, *Conophthorus coniperda*, is also a serious threat to white pine management.

According to an article written by Eric Otto, Northeast Regional forest health specialist for the Minnesota DNR, infestation of the white pine cone beetle has been noticeable this year, with damage being seen in Itasca County, though it is likely present in additional areas.

Diseases, including white pine blister rust, red ring rot, root rot, wood decay and certain needle fungi cause losses in white pine stands. Natural elements such as snow, ice and wind may also cause damage to white pine.

Did you know? Tall white pines in the Thirteen Colonies were marked by agents of the Crown and were reserved for the British Royal Navy. This was controversial in the colonies, and led to the Pine Tree Riot in 1772, which played a role in the events leading to the American Revolution.



Photos by *Eli Sagor*.

Forest Stand Carrying Capacity: How many trees can exist on a site?

By Ryan Heiderman

Density and stocking are often used interchangeably in forestry, but these terms are not synonymous. Stand density is a quantitative measurement denoting the degree of stem crowding, whereas stocking refers to the adequacy of a given stand density to meet some management objectives. As trees grow, and in particular their canopies, their demands on limited forest resources and growing space increase. This demand for space often leads to density-dependent mortality. Initially, forest stand development is essentially free of competition during which time mortality is independent of density. As the overcrowded stand grows, plant density becomes successively lower due to competitive interaction between individuals and subsequent death of the suppressed. Timing of the onset of density-dependent mortality, sometimes referred to as self-thinning, can often be predicted through an understanding of density measures and stocking guidelines.

There are many biological and environmental controls on self-thinning rates. Leaf characteristics and the general crown shape can determine the packing efficiency of a particular species. Pyramidal or excurrent crowns typical of conifers allow more individual stems to be packed into an area than the rounded or decurrent crowns typical of deciduous trees. Shade tolerance plays an important role in the rate at which self-thinning occurs, where in general the more tolerant the species is to shading the greater the packing density achieved. Favorable climate and soils can contribute as well to the site carrying capacity.

In 1933, L.H. Reineke, associate silviculturist of the U.S.

Forest Service, first described what he called the stand density index. Stand density index (SDI) describes the number of trees per unit area in reference to a specified diameter, usually 10 inches. This index serves as a tool for silvicultural prescriptions, in particular timing and levels of thinning and other density control measures such as planting and species selection. Density can be expressed in absolute or relative terms. Relative density is defined as the current SDI compared to some specific maximum. At 25% of maximum SDI comes the onset of competition, at 35% is the lower limit of full site occupancy and at 60% self-thinning begins.

Maximum SDI has been shown to be site-dependent, but there are many published reference values for important tree species growing in Minnesota forests. For example, northern red oak maximum SDI is around 320 trees per acre, which is the maximum number of 10-inch trees per acre that could possibly exist in a stand. The maximum density of eastern hemlock is significantly higher at around 415 trees per acre. This maximum is rarely, if ever, seen in nature because of the effects of self-thinning and density-dependent mortality.

Intuitively, you can judge whether a stand is overcrowded when you notice suppressed dead or dying trees. The goal of many silvicultural prescriptions is to anticipate and capture this death before it occurs through manipulation and control of stand density.

Consult published stocking guidelines or density management diagrams for your tree species of interest.



Red pine plantation, thinned twice, southern Carlton County, Minnesota. Photo by Eli Sagor.

MFA Newsletter Preference Survey

Traditionally, newsletters were designed to be printed and mailed to inform members of organizations about events and topics of interest. MFA spends a considerable amount of money on developing and mailing the newsletter to its members.

In this digital age with email, social media and YouTube, keeping up with current events and topics is even more of a challenge. This survey is designed to get your current thoughts and move forward on how best to inform and collaborate with MFA members.

Your answers to the following questions will help MFA improve its delivery of communication in the future.

Take this survey
online at: www.minnesotaforestry.org

Or mail this completed
survey to:

Matthew Russell
1530 Cleveland Ave. N
St. Paul, MN 55108

1. After receiving the MFA bi-monthly newsletter in the mail, do you typically:

- Toss in recycling without reading it
- Open it and skim it
- Open it and read most of it
- Open it and read all of it

2. How likely would you be to read an electronic version of the newsletter delivered via email?

- Not at all likely
- Somewhat likely
- Very likely

3. What is your preference for receiving future MFA newsletters?

- Printed newsletter only
- Email newsletter only
- Both printed and email newsletters

4. When thinking about the printed MFA newsletter, please rate the following:

	Very poor	Poor	Average	Good	Very good
Overall quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Appearance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Readability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Importance of topics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Which topics are you most interested in reading about in the MFA newsletter? Check all that apply.

- Upcoming events
- Landowner profiles
- Staying informed about MFA activities
- Woodland management topics
- Tree insects and diseases
- Timber harvesting
- Wildlife
- Forest property taxes
- Planting trees
- Other: _____

6. Would you be open to seeing advertisements in the MFA newsletter?

- Yes
- No

7. How would you describe the speed of internet service at your home?

- Fast and reliable
- Somewhat slow but adequate
- I don't have internet access at home

8. How can MFA better serve you?

9. Have you encountered challenges trying to communicate with MFA? If so, please explain.

10. Are you interested in contributing articles? If so, please leave your name, email and phone number below.

- Yes
- No

11. What is your gender?

- Male
- Female

Your name Optional: _____

Email address Optional: _____

Phone number Optional: _____

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: Practical Applications of an Indigenous Model of Sustainability Tuesday, Oct. 20, 12-1 p.m.

Speaker: Mike Dockry, University of Minnesota Department of Forest Resources. Gain an overview of an Indigenous model of sustainability that can help integrate complexity, uncertainty and values into forestry decision making. The model is based on the Menominee Tribe's experiences managing the oldest sustainable forest in the United States. Learn more and register online at <https://sfec.cfans.umn.edu/2020-webinar-oct>.

Webinar: Forest Health Updates from Across Minnesota Tuesday, Nov. 17, 12-1 p.m.

Hear an update on the status and trends in forest health from all corners of the state. Learn more and register online at <https://sfec.cfans.umn.edu/2020-webinar-nov>.

MNWWN Partners with State Horticultural Society

By Barb Spears

Minnesota Women's Woodland Network (MNWWN) has the good fortune of great partners — including the MFA — that contribute to the success of the network. Most recently, we have found a wonderful partner in the Minnesota State Horticultural Society (MSHS).

The MSHS has worked with board member and owner of Landscape Restoration, Inc. Cheryl Culbreth to provide a spring webinar series on native plants and a fall webinar series on invasive species including buckthorn, garlic mustard and oriental bittersweet. The mission of the MSHS is to grow cold-climate gardeners through education, encouragement and community. It recognizes that many of the members are also woodland owners, so our partnership provides an opportunity for both organizations to reach their members with information and opportunities to learn about healthy landscapes. The MSHS hosts classes and webinars and has a wealth of information on its website. Learn more about the MSHS at <https://northerngardener.org/>.

To view the recorded webinars presented by Culbreth, visit the MNWWN website at <http://www.mnwwn.org/resources>. You can also follow MNWWN on Facebook at facebook.com/MNWWN and on Instagram at [@MNWWN_](https://instagram.com/MNWWN_).



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Change Service Requested

New Video on Becoming an Advocate for Natural Resources

Being a steward of the environment doesn't have to stop at your property line. You can make a big difference by advocating for change with policymakers and natural resource managers. Watch the new video online at <https://www.youtube.com/watch?v=uAOBxqtbVg&feature=youtu.be> to learn about becoming a volunteer advocate for natural resource management.

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