Partners News

January/February 2013

Contact us at:

Partners in Forestry
Landowner Cooperative

6063 Baker Lake Road
Conover, WI 54519

partnersinforestry@gmail.com
715-479-8528

PIF's Website:
www.partnersinforestry.com

Inside this issue:

PREFACE

by Joe Hovel

In the last issue I really enjoyed writing the story about Forest Legacy, it was an upbeat subject, and a pleasure to focus on positive achievements of that scale. However, once again this winter, with a severe lack of moisture in northern Wisconsin and much of the UP we are starkly reminded of a changing climate.

In this issue we focus, once again, on Forest Health and highlight the Maple Decline issue so prevalent among the minds of land owners in The UP and Northern Wisconsin

The upper peninsula has a world wide reputation for quality sugar maple, and any reduction in the quality or quantity of high grade maple is sure to have adverse effects through out the region. Our main feature is written by Gary Willis, DNR Service Forester from Baraga. Gary has long had ties to forestry in the UP, working with Michigan Tech and as a consultant with private landowners. I respect Gary's common sense method of educating us on these very complex issues and his guidance as we manage our own lands in the UP.

As an introduction to a complex concern that Gary details, we present this select excerpt from the Michigan DNR Forest Health newsletter.

Extracted from the Michigan Forest Health newsletter. Thanks to Robert Heyd.
(contact Joe to view the full Michigan Forest Health Newsletter by email)

Forest Decline

Tree decline refers to a gradual loss of tree growth and vigor. Declining trees often have some combination of off-color leaves, early leaf drop, poor growth and dieback of twigs and branches. This condition usually progresses slowly over several years. During this time trees may be susceptible to some combination of insect attacks, diseases, and adverse weather conditions like drought and late frosts. These stressors can further reduce growth and may increase the likelihood of tree death.

Following is a section on the contribution of past drought years to many of Michigan's forest declines, and sections describing observed declines of aspen, hickory, maple, oak and white pine.

Drought

Following the 2006-2008 drought, rainfall returned to near normal levels beginning in 2009. However, areas in the Western Upper Peninsula continued to experience moderately dry conditions in 2011. Although we are in the third year of near normal rainfall, it takes years for trees to rebuild food reserves. The drought has been a major influence on tree health, especially in the Western Upper Peninsula, which saw consecutive years of extreme drought.

Droughts can trigger significant declines in tree canopy health. Hardest hit are trees that grow in light, sandy soils or on lowlands exposed to significant water table fluctuations. Drought stressed trees are susceptible to a host of insect pests and diseases. Oak is affected by the two-lined chestnut borer (*Agrilus bilineatus*); paper birch is affected by the bronze birch borer (*Agrilus anxius*); larch is affected by the Eastern larch beetle (*Dendroctonus simplex*), and jack and red pine saplings are affected by *Diplodia* and *Armillaria*.

Maple Decline Increases in the Western Upper Peninsula

Maple dieback has been reported for the last few years in Michigan's western Upper Peninsula and continues to be investigated by Michigan Technological University. On 118 monitoring plots established across industry, state, and federal lands in the Upper Peninsula, northern Wisconsin, and eastern Minnesota, the average sugar maple dieback level increased from just over 2% in 2010 to 16.5% average dieback in 2011. A vigorous sugar maple stand should have less than 10% average dieback. Information continues to be processed on growth rings, climate, management, soil and foliage nutrients, and other potential factors associated with historical maple dieback in other regions. Initial findings from foliar nutrient analyses suggest imbalances in some nutrients compared with literature levels. Research will continue to investigate these factors and monitor the progress of maple dieback in the region with the ultimate goal of incorporating findings into management plans to prevent loss from maple dieback in northern hardwood forests.

Have you checked out PIF's website?

www.partnersinforestry.com

Please use the website to expose your business, service, or tree farm. Share thoughts, ideas, articles, photos, links.

All suggestions are welcome and appreciated! This is your COOP, we need your input as much or more than your dues.

Please forward the information to Margo Popovich at margo122050@mac.com.

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

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

Future Articles

PIF members are encouraged to submit articles, announcements, photos, and items of interest for future newsletters. Submissions may be forwarded to Margo Popovich at margo122050@mac.com or mailed to:

Partners In Forestry
6063 Baker Lake Rd
Conover, WI 54519

NORTHERN HARDWOOD DECLINE

By Gary Willis, Service Forester, Michigan DNR

The declining sugar maple (Figure 1, shown at right) is typical of an increasing number of hardwoods growing in portions of the western Upper Peninsula. One of the most affected areas is the Michigamme Highlands – the high country that lies between US 41 in Baraga and Marquette counties and Lake Superior to the north. This particular tree occurs in a northern hardwood stand along the Peshekee Grade (County Road 607) an estimated 15 miles north of US 41 and Lake Michigamme. Of primary concern are the dead branches in the outer crown. Although this hardwood stand was thinned an estimated 20 years ago, the canopy has not yet fully closed as expected. This limited crown expansion is evidenced by the advance reproduction (saplings 1 to 3 inches diameter breast height) growing in the understory (Figure 2).

Figure 1. Declining sugar maple

The leaves of declining sugar and red maple and other northern hardwoods frequently are chlorotic (off-color) and smaller in size than leaves found on vigorous trees. Lower leaf density (fewer leaves) on declining hardwoods also allows more light to reach the forest floor further enhancing the growth of hardwood regeneration – a tell-tale sign. Small branches in the outer crown may appear rough and stunted due to die-back and slow growth. The rough appearance is, in some cases, accentuated by lichens that are able to colonize on what have become rough-barked, slow growing twigs. Lichens usually find a vigorous outer crown too smooth-barked to extensively colonize. They are many times restricted to rough-barked large branches and tree trunks.

As branches die and leaf mass is diminished, overall sugar production is reduced resulting in poorer vigor and thus the inability to heal-over injuries. What initiates decline? Growing season drought is suspected to be a primary stressor that predisposes weakened trees to attack by insects and disease. The relatively shallow Champion-Michigamme sandy loam over bedrock soil that is a primary soil type in the Michigamme Highlands has proven itself to be capable of producing vigorous, high quality stands of northern hardwoods in the past, provided stands receive adequate, uniform precipitation. This traditionally resilient forest has been very responsive to repeated crop tree selection thinnings as evidenced by the high quality hardwoods, most notably sugar maple, that have been produced on these largely industrial forest lands since the 1920s.

Figure 2. Slow growing canopy as evidenced by well-stocked advance hardwood regeneration.

Because these soils are relatively shallow and of sand origin, uniform precipitation is essential to maintain the vigor of the rhizosphere (soil community). In many cases, nutrients are so limited that a large percentage is cycled from storage in the organic matter duff layer to the leaves and feeding rootlets each year. This has been called "base-pumping". Many of a tree's masses of feeding rootlets (root hairs) are concentrated in layers and pockets of soil organic matter where many of the soil's nutrients occur and where soil water is efficiently stored. Thus feeding rootlets are frequently found in the upper soil layers where the organic matter rich portions of a sandy loam soil occur. A drought that results in desiccation of a soil's organic matter layers may cause the mortality of masses of feeding rootlets and thus initiate irreversible decline as the tree's outer crown soon reflects this loss of water and nutrient uptake. Loss of leaf volume in turn results in reduced sugar production and overall vigor which makes it difficult for the tree to respond with new rootlet growth. A downward spiral has begun.

Anytime there is an opening (entry court) in the cambium on a tree, including dead branches and roots, oxygen enters through the injury. In a relatively short time, bacteria, followed by blue-stain fungi are able to invade the exposed wood and literally soften the resistance for wood decaying fungi that follow in a few years. One of the difficult to evaluate risks is the rate at which discoloration and thus loss of grade is occurring in declining hardwoods. Whereas a vigorous sugar maple is able to compartmentalize (seal off) blue stain that is invading an open injury, declining maple may not have the resources to effectively do so. It has been reported that severely declining maple may have larger degrading stain in upper logs where blue stain fungi are entering through dead branches in the crown and discoloring the heart of the upper stem.

Forest landowners in this region are faced with a dilemma – how to determine when the risk of hardwood grade and volume loss from decline dictates modification of silvicultural prescription. Although some degree of die-back is occurring on many soil and habitat types throughout the region, some sites and stands are more affected than others. Initial observations indicate that stands that have been conservatively managed for decades for larger diameter sawtimber are weathering the droughts better than stands that have been repeatedly heavily thinned every 15 to 20 years down to basal areas of 70 square feet or lower. One issue is whether exposure of the soil rhizosphere by heavy thinning contributes to decline and if so, in what ways? Should landowners modify their harvest schedules and prescriptions during drought years?

In some cases where decline is most prevalent, forest managers are converting portions of uneven-aged hardwood stands to even-aged by applying overstory removal, modified shelterwood or group selection-salvage and thus changing the cutting cycle from 15 to 20 years to 50 years or more. In other cases, industry lands are being converted to oak-pine through natural regeneration and planting. Much effort is being made to identify and treat those most adversely affected stands to reduce losses. The need for

information is great but research and resultant management recommendations are lacking. An important ongoing study of maple and northern hardwood decline is being conducted by Dr. Andrew Storer at Michigan Technological University. Initially funded by forest industry, they are conducting a preliminary investigation to document the process and extent of maple-hardwood decline in the region. In addition to documenting the extent of decline, they are also quantifying changes in chemical composition of the leaves and wood of stressed trees. *

*(*See Page 10 for summary of research by Dr. Andrew Storer mad PhD Candidate Tara Bal of Michigan Technological University, as well as Pages 11 and 22 for photographs related to the research)*

Little is known about the effects of drought on the soil rhizosphere and the interrelated communities of soil microbes, fungi and plant roots. In recent years, researchers are discovering more about the importance of the symbiotic relationship between fungal hyphae (comparable to roots) and plants roots called mycorrhiza. The following is quoted from Cripps, C. 2001. Mycorrhiza. in Maloy, O. C. and Murray, T. D. 2001. Encyclopedia of Plant Pathology. Vol II. John Wiley & Sons, Inc.

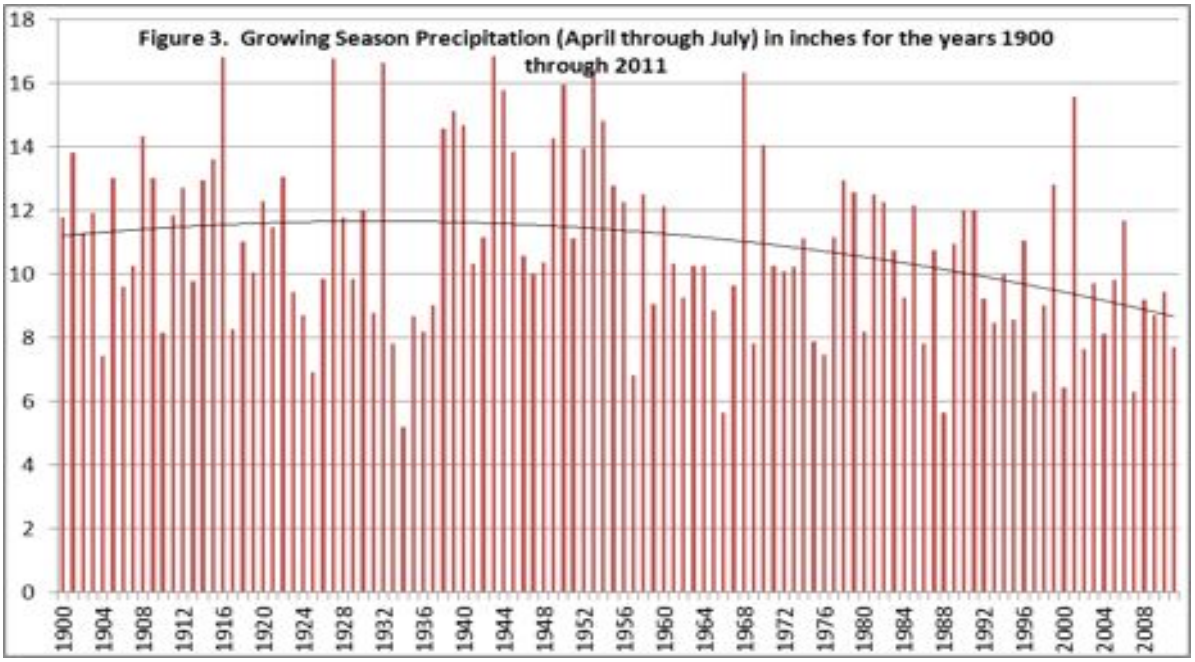
"A mycorrhiza is a mutualistic symbiosis between a fungus and the roots of a plant. This interaction results in recognizable fungal structures on or within roots. Mycorrhizal fungi gain carbohydrates (simple sugars) from plant roots, and enhance plant uptake of inorganic nutrients, particularly phosphorus and nitrogen. The relationship is considered non-pathogenic, and of benefit to the plants involved. The mycorrhizal condition is the normal state of over 85% of plants in nature. Thousands of fungal species and most plants form mycorrhizae. The relationship is not generic, and there are many plant-fungus combinations, each with its own unique properties.

The establishment, growth, and health of plants are enhanced by mycorrhizal formation under most conditions. In addition to increasing uptake of inorganic nutrients (NPK) and water, mycorrhizae can provide plants with protection against drought, high soil temperatures, acidity, heavy metals, some pathogens, nematodes, insects, and other soil organisms. "

It is now believed that many plants within an ecosystem are interconnected by way of fungal hyphae which are root-like in function. The mechanisms of increased absorption are both physical and chemical. Mycorrhizal hyphae are much smaller in diameter than the smallest root-hair, and thus can explore a greater volume of soil, providing an exponentially larger surface area for absorption. Also, the cell membrane chemistry of fungal hyphae is different from that of plants. Because the tiny growing tip of hyphae excretes organic acid, they are able to penetrate, extract and translocate essential nutrients and micronutrients from soil parent material including sand grains and other soil particles. Electron microscopy photos reveal that hyphae can bore holes through grains of sand! Potassium, especially limited on most sandy loam sites and other volatile, easily lost nutrients such as phosphorus may originate from chemical extractions made by fungal hyphae. In addition to nutrient extractions from mineral soil and parent material, fungi are also essential for the recycling of nutrients derived from the decay of woody debris. Translocation of nutrients to trees and other plants in a community occurs then by way of osmotic pressure through the extensive network of microscopic mycorrhizal plant root-hyphae connections. Thus mycorrhiza are especially beneficial for the plant partner in nutrient-poor soils.

Does the combination of drought and soil exposure from repeated or heavy thinning of hardwood stands adversely affect the mycorrhizal network and thus a hardwood stand's ability to survive drought? Some researchers are speculating that hardwood shade tolerance may, for some species, be more of a function of the connection of suppressed trees to the mycorrhizal network. Research of the soil rhizosphere that results in practical application of drought-related impacts is greatly lacking for northern hardwood soil/ sites.

Figure 3 is a graph of the precipitation that was measured for the growing season months of April through July for the years 1900 through 2011 at the Houghton County Airport which is located just East of US 41 between Houghton and Calumet. Although located 35 miles north of the Michigamme Highlands, this is the closest weather station with 100 plus years of records.



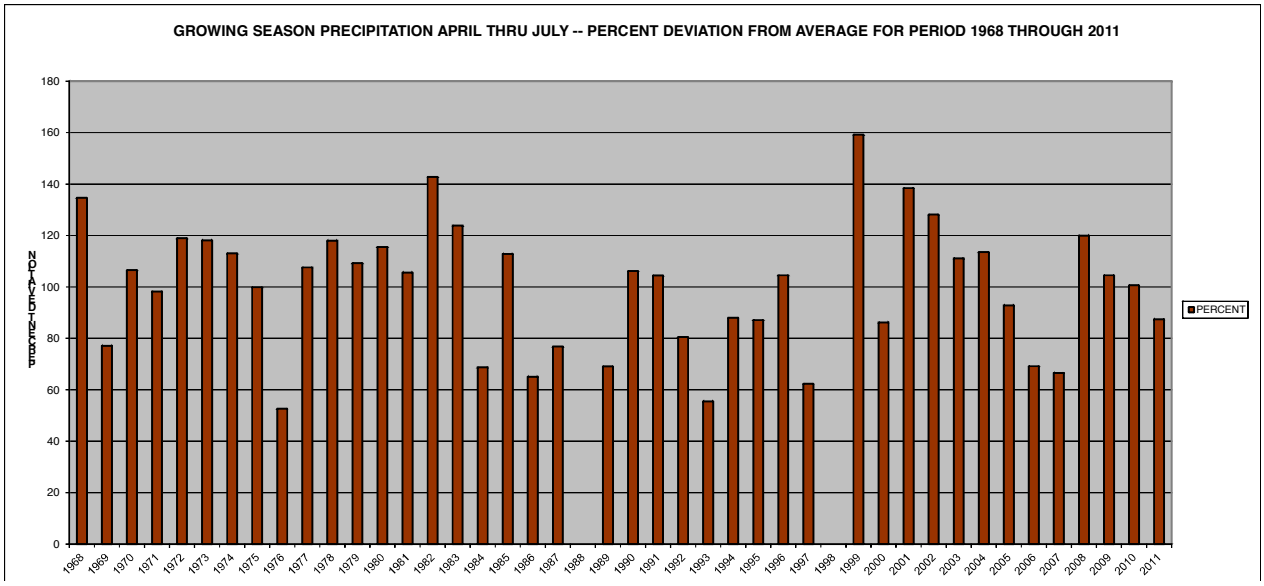
From preliminary studies, there appears to be a 10 inch threshold amount of growing season rainfall below which there is a strong correlation between precipitation and growth. Rainfall amounts above 10 inches result in significantly more growth, but growth with greater variability between trees. A glance at the overall chart in Figure 3 shows the growing season drought years – the prolonged droughts from 1923 through 1926 and 1933 through 1936. The lowest amounts of growing season precipitation occurred in 1934 when only 5.21 inches fell over the four month period compared to a 112 year growing season average of 10.89 inches. These years have been permanently recorded in growth rings of many trees as have the droughts of 1966, 1988, and other later dry years. Many current hardwood stand dominant and codominant trees lived through the droughts of the 1920s and 1930s. Tree ring chronologies from the region document the reduced growth of those years. However, following these dry periods prior to 1950

many hardwoods responded to a return to normal rainfall and grew at expected rates for trees of good vigor.

Some of the driest growing seasons have occurred since the 1950s (Houghton County Airport) including only 5.65 inches during 1988 and 6.42 inches during 2000. During the summer of 1988, hardwoods were shedding their leaves during early August at the height of the drought on some sites in the Michigamme Highlands. After 1988, only seven of the next 23 growing seasons received greater than 10 inches of precipitation. Comparing the 50 year average for years with greater than 10 inches of growing season precipitation verses years with less, for the period 1900 through 1950 the drought years averaged 8.48 inches while the "normal" years averaged 13.03 inches. For the next 50 year period, 1951 through 2000, dry years and normal years averaged 7.83 and 11.70 inches respectively. The black trend line in Figure 3 clearly shows the changing, diminishing precipitation pattern.

Figure 4 is a graph showing the percent deviation from average growing season precipitation for Herman, Michigan, which is located on the western edge of the Michigamme Highlands and approximately 35 miles south of the Houghton County Airport at an elevation of 1,730 feet or approximately 670 feet higher than the Airport weather station. Because of the higher elevation, Herman normally receives considerable precipitation by way of orographic uplift of air masses moving from Lake Superior. Although these records only go back to 1968 and there are two years of missing data, they still provide a record of most of the drought years. Among the driest recorded for the Herman area occurred in 1976 when only 7.43 inches were recorded. In the following years, top die-back began to occur in scattered yellow birch on drier sites at the Ford Forestry Center research forest which received only 6.42 inches for the four month period April

Figure 4. Growing season precipitation April through July for Herman, Michigan for the period 1968 through 2011



through July. During the 1980s, an outbreak of white birch leaf-miner predisposed many stands to attack by the bronze birch borer which killed a high percentage of attacked trees. It was theorized that the drought of 1976 had initiated an irreversible decline of especially white birch on some sites. It should be noted that much of the white birch stands were at the time 40 to 60 years old following even-aged stand regeneration after the heavy cutting and fires of the 1930s.

Following 1976, there were growing season droughts in 1984, 1986 through 1989. Although the data is missing for 1988 from the Herman weather station, Ford Forestry Center, which lies 6.7 miles southwest of and 400 feet in elevation lower than the Herman weather station, received only 4.97 inches – the lowest amount since 1957 when weather records were first recorded. Unfortunately the weather station at Ford Forestry Center was closed in 1996. Following the regional droughts of the 1980s, USFS Forest researcher David Houston reported episodes of localized sugar maple decline in the Northeastern U.S. and a more widespread decline occurring in Quebec, Canada. As a result, the International North American Sugar Maple Decline Project (NAMP) was initiated. A publication printed in *Sugar Maple Ecology and Health. Proceedings of an International Symposium GT8- NE-261* provides an excellent literature review of historical documentation of sugar maple decline.

The publication is available at http://nrs.fs.fed.us/pubs/gtr/gtr_ne261%20papers/3_houston_261.pdf

Since 1990, the most severe drought in portions of the western Upper Peninsula since weather records have been kept occurred during 2006 and 2007, when the total annual precipitation for five miles west of Baraga was 22.67 and 21.02 inches respectively. The four month growing season precipitation (April through July) was 8.62 and 4.53 inches for the same years. Comparing the Baraga County precipitation totals to the average Houghton County Airport annual total which is 34.35 inches, from January 1, 2006, through December 31, 2007, there was a 25.01 inch deficit. Lake Superior came within a few inches of its all-time low of 599.8 feet in 1926. During the six month period from March 1, 2007, through August 27, 2007, the total rainfall for the spring and summer was 5.58 inches compared to a long term average at the Houghton County Airport of 16.25 inches. Numerous small streams dried up and a spruce budworm outbreak got underway in portions of Baraga, Houghton and Ontonagon counties. Whereas the droughts of the early 1900s were followed by a return to or greater than normal precipitation, the effects of the droughts beginning in 1976 and heightening during the 1980s have not been alleviated.

Although there has been considerable regional modeling done regarding the effects of altered rainfall patterns on North American forests, Upper Peninsula forest managers and landowners have little specific information on which to base long-term hardwood management decisions. Liquidation of small portions of once vigorous northern hardwood stands on industrial and non-industrial private lands in the especially hard-hit area of the Michigamme Highlands and the Keweenaw Peninsula has begun. Some industrial forest landowners are making every effort to identify and delineate only those most severely declining stands for liquidation while leaving those not as severely affected portions in hopes that adequate precipitation will once again occur and that stressed trees will recover and resume profitable rates of annual growth. The stakes are high. Allowing a stand of northern hardwoods to decline to the point where discoloration from

top and root dieback reduces log grade and thus value defeats the objective of crop tree release/selection management.

In conclusion, guidelines and recommendations for modification of silvicultural prescription for northern hardwoods occurring in western Upper Michigan during this period of changing rainfall patterns are very much lacking. All that can be offered at this point is based on observation and response to the high risk of grade and volume loss for the most severely affected stands. In many cases throughout the region, hardwood stands that have been managed by crop tree release – selection thinning to diameters of 20 inches or more depending on site quality growth and basal areas of 85 to 100 square feet appear to be more resilient to drought than stands that have been repeatedly entered and more heavily cut. Based on the likely importance of the mycorrhizal network and the finely balanced system of water retention, soil atmosphere and nutrient recycling in hardwood stands growing on the fairly fragile, drought-prone, sandy loam soils of the western UP, even greater care should be exercised in protecting the soil rhizosphere during harvesting operations from compaction and rutting. It is also suggested that at least a portion of the residual biomass be left scattered over the site following logging in order to provide a measure of protection for the soil from heating and drying. Site damage is many times minimized by harvesting during frozen ground or late summer/fall dry soil conditions. Finally from research conducted in the Pacific Northwest, there may be good reason to increase the diameter of potential crop trees on quality sites up to 20 inches in order to retain those trees that are most supporting the mycorrhizal network. In summary, where possible, conservative, well-planned thinnings may be the best modification to northern hardwood management on better sites.

GARY WILLIS

Michigan DNR, Service Forester

Michigan Tech University,
Research Forester,
Assistant Professor

Forestry Consultant

Joe: Our big thanks to Gary Willis for his work in presenting this great feature. Because of my investment in UP timberland I am especially concerned about this issue.

Note, Gary's reference to the Michigamme Highlands. This is a special region in the UP, just south of Lake Superior, from which rivers like the Sturgeon, the Slate and the Silver flow north to Lake Superior, and from which also rivers like the Peshekee go south to Lake Michigan. This is also moose country in the UP.

MAPLE DIEBACK

Michigan Technological University
USDA Forest Service Evaluation Monitoring Project
Maple Dieback in Western Upper Peninsula, MI
PhD. Candidate Tara Bal & Dr. Andrew Storer

Sugar maple dieback continues to be seen in Upper Michigan, northern Wisconsin, and eastern Minnesota. In 2012, the average sugar maple dieback in Upper Michigan was 12.4% with more than half (56%) of plots having 10% dieback or greater and 11% of plots having 25-76% crown dieback (with 94 maple health plots in the western UP). A vigorous sugar maple stand should likely have less than 10% dieback. Average percent dieback is down from 19.6% in 2011 in the same plots in the western UP. Old dead twigs and branches that have been recorded as dieback previously have likely decayed and dropped over winter contributing to the decrease in dieback. Soil and foliar nutrient analysis suggest specific site variations in deficient, toxic, or antagonistic levels of soil calcium, magnesium, phosphorus, potassium, manganese, and aluminum and other metals that may have predisposed trees to decline. Moderately dry drought conditions in recent years, especially in the Western Upper Michigan has likely further contributed to maple dieback and decline. Tree ring analysis indicates a decreasing trend in annual maple growth for at least the past six decades with strong correlations to precipitation and snow cover. Analysis of climate and other factors such as sugar maple borer, soil pH and texture, invasive earthworms, and management history are ongoing. The progress of maple dieback will continue to be monitored in the region, with the ultimate goal of incorporating findings into updated management plans to prevent or mitigate timber loss from maple dieback in northern hardwood forests.

2012 Maple Decline in Michigan
Robert Hyde

Although reports from the MTU Maple Decline Evaluation Monitoring Project (above) show that maple decline in study plots was down from 2011 levels, several new areas of severe decline associated with management practices on stressed sites were reported in 2012. Several areas of maple decline resulting in significant maple mortality were detected in the northwest region of the Northern Lower Peninsula (NLP) (Kalkaska, Missaukee, Wexford, Grand Traverse, and Benzie Counties) and in the north central Upper Peninsula (Marquette County). Approximately 500 acres of high quality NLP northern hardwood sites were impacted. In addition to sugar maple mortality, high quality northern red oaks when present in these NLP stands were also affected.

Drought continues to be a major factor contributing to maple decline. Management also appears to be a factor in reported 2012 decline and mortality. All of the stands that experienced mortality in the NLP were thinned or selectively harvested a year or two before, or during the heavy Forest Tent Caterpillar defoliation of 2009 & 2010. Trees stressed by drought, management, and heavy defoliation were at increased risk of decline and mortality due to below threshold energy reserves caused by the combination of stressors. Tree decline and death can result directly from a loss of energy reserves, but more commonly, this predisposes (weakens) trees to attacks by secondary invaders (insects and diseases) such as Armillaria root rot or, in the case of oaks, the two-lined chestnut borer.

Photos on pages 10, 11, and 22 provided by Tara Bal

Sugar maple dieback on industry land in Baraga County, MI, 2012.

Sugar Maple Dieback in Keweenaw County, MI 2012

Sugar maple dieback in the Ottawa National Forest, Ontonagon County, MI in 2012

Severe dieback and mortality in a sugar maple stand in Keweenaw County, MI

Horizontal scar and bark split from a sugar maple borer (*Glycobius speciosus*) gallery

Dark staining symptomatic of sapstreak disease (*Ceratocystis virescens*) in freshly exposed sapwood in the root collar of a sugar maple tree

Words of advice on the Hardwood Decline issue:

From Bob Heyd:

Remember that forestry is a young science in the United States. Learning is done as trees establish on sites of varying suitability, compete within their environment/ niche, reproduce and are eventually recycled as nutrients and biomass. Most of us live only to see a portion of these cycles and which are shaped by a seemly ever changing environment…droughts, exotic insects and disease and cycles of native insects and diseases which utilized stressed/predisposed resources. Lots going on and it is a moving target with a global economy and mobile society moving "chess pieces" to new locations with sometimes devastating results.

Robert Heyd, Ph.D.
Forest Health Management
Forest Resources Division
Michigan Dept. of Nat'l Resource
1990 US 41 South
Marquette, MI 49855
(906)228-6561

From PIF Vice President, John Schwarzmann, Forest Supervisor of the Wisconsin Board of Commissioners of Public Lands

Lets be careful to avoid dieback from drought with timber sales. These 4 basic tips come to mind!

1) Avoid cutting in very shallow rocky soils. If you can see roots at the surface the soil it is very shallow and dieback will very likely occur following logging if drought conditions persist.
2) Leave as many conifers as possible. Conifers cast shade all year which prevents evaporation in the key months of April and May. Conifer foliage is also harder to decompose so it builds a duff layer which also acts to conserve moisture.
3) Leave a higher residual basal area. Instead of cutting to a basal area of 80 in northern hardwoods or oak stands it may be a good idea to leave a residual basal area of 90-95. In order to make the sale commercial, you may have to let the basal area build up a bit more before engaging in a timber sale, perhaps a basal area of 125-130.
4) Avoid cutting when drought conditions are at their worst. Unless the summer has had adequate moisture, you may want to postpone logging if summer drought conditions are present. The gaps in the canopy that occurs when tress are cut just allows more direct sunlight to reach the forest floor and create even hotter and drier conditions.

FIELD TRIP TO PESHTIGO RIVER PINES

by Rod Sharka

The weather was not the greatest when the hearty PIF participants left Trees For Tomorrow in Eagle River on the morning of Saturday, October 6. The howling north wind and lake effect snow showers created a stark contrast against the significant amount of fall color still clinging to the trees observed on the hour drive to Laona. However, by the time we reached the 200 acre Peshtigo River Pine tract owned and managed by the Wisconsin Board of Commissioners of Public Lands (BCPL), the sun came out (for a while at least), and the temperature warmed up just enough for a very pleasant fall hike through some really beautiful woodlands to view the many exceptionally impressive white pines scattered throughout the mixed hardwood stand. There still was enough fall color to soak in while having enough leaves down to be able to enjoy vistas of the Peshtigo River and unobstructed, up close views of the magnificent white pines.

The tour was led by John Schwarzmann, Forest Supervisor for the BCPL. John explained that this particular tract of land has been owned and managed by the BCPL since 1883. Since then, it has been selectively harvested a couple of times and is up for a conservative thinning again, possibly as early as this winter. However, most of the white pines will be left untouched as they are still growing.

During the tour, John demonstrated measurement of tree diameter (diameter breast height or dbh), as well as tree height using a clinometer. Measured pines had diameters up to 41 inches and heights of up to 141 feet. It was interesting to note that the largest pines seemed to be found at the bottoms of low depressions in this very hilly topography. The explanation given was that more nutrients tended to wash down to the bottoms of these depressions, and more moisture was available to support tree growth in this sandy, loam soil.

It's interesting to note that the McArthur White Pine which held the distinction of being the nation's largest white pine from 1945 until 1977 when it was "decapitated" by lightning and lost its top 40 feet, lived just a few miles northeast of the Peshtigo river Pine tract we visited. The McArthur Pine, which was over 400 years old, reached a maximum height of 148 feet but had a maximum dbh of 5'7". The tall pines we observed during our tour were nearly as tall but had a maximum diameter of only 41". John estimated their age at only about 120 years. He explained that they likely have nearly reached their maximum height but will continue to grow in girth. A coring sample taken suggests that they are currently increasing in diameter at the rate of about 2" per decade – a very respectable growth rate. Since they are still relatively young trees, it is very possible that in time, some could reach or exceed the height and girth of the famous McArthur Pine which, sadly, fell over on June 24, 2001 due to a suspicious fire set in its hollow base.

Other components of this very diverse forest tract included red and sugar maple, basswood, white and yellow birch, and even some white cedar, hemlock, American elm, as well as some very nice cherry. All in all, it turned out to be a very informative and enjoyable day. A hearty thank you is in order to John Schwarzmann for organizing and leading this tour to such a beautiful forest tract as well as for sharing his extensive knowledge and expertise. It was an awesome day.

"It is as if an extra 16 foot long log was added to the stem of these pines relative to other stands of white pine that we see in the area."

McArthur White Pine

The Peshtigo River Pines Field Trip photos contributed by Rod Sharka

John Schwarzmann (l) and Mark Hovel (r) checking growth rate

Big Peshtigo pines

Clinometer usage

Tall pines

Measuring diameter breast height (dbh)

Peshtigo River outing

We are pleased to present this feature from Maria Janowiak and Jerry Greenberg as a primer to the Shared Landscape Initiative. PIF will stay in the loop on this initiative, as we were part of a meeting in 2011. If anyone wishes to learn more please contact me.

THE "WHAT IFS" OF LAND MANAGEMENT:

MANAGING YOUR WOODS FOR CHANGING CONDITIONS

As a landowner managing your woods, you no doubt have had to grapple with questions that arise from a host of future unknowns. What if wood prices stay soft next year? What if the Emerald Ash Borer shows up? What if the drought persists next summer? What can I do today to help my grandkids earn income from my woods in the future?

To help deal with these kinds of "what if" questions, many landowners routinely build risk management into their decision-making, whether they realize it or not. In other words, what can be done today to hedge future income bets against unknown future conditions – conditions that could lead to significant economic loss? To make matters even more challenging, we have entered a new era of uncertainty as landowners now wrestle with the profoundly complex question of what a changing climate means to the forests of Wisconsin and the U P of Michigan.

Of course, risk management is much more an art than a science, and to a large degree it always will be. Yet, a new network of foresters, land owners, and resource scientists in Wisconsin, is working to change that. Called the Shared Landscapes Initiative www.sharedlandscapes.org, the network came together to help landowners and land managers deal with the challenge of managing forests under uncertain and changing conditions. SLI, as it is known, makes available a broad suite of resources, including a new tool that incorporates the latest information and lessons about a changing climate into forest management decision-making.

The tool is called *Forest Adaptation Resources: Climate Change Tools and Approaches for Land Managers* and can be found at this web site: www.nrs.fs.fed.us/pubs/40543. While it can help the newer landowner who is just beginning to manage his or her woods, its real power is in how it helps all landowners –even the most experienced – understand the management steps that can be taken today to address both the challenges and opportunities of a changing climate and a changing forest.

For example, Wisconsin's weather patterns are expected to become drier and warmer, meaning that we could see more drought conditions. Ironically enough, there will also be an increased likelihood of severe rain and wind events, resulting in the potential for more forest disturbance. And, there will likely be new invasive plant species, pests, and diseases in the future, especially where forests are under greater stress, say from drought.

While there are no easy answers, the *Forest Adaptation Resources* provides landowners with

some tangible help to manage the risk inherent in these kinds of ever more complex questions. For example, it can help landowners understand which tree species are likely to decline in some parts of the Northwoods and which are likely to expand their historic range in the changing conditions. Optimal climatic conditions for boreal species, such as fir, spruce, and aspen, are expected to shift north as the climate gets warmer and drier in the coming decades. Those same changes could lead to more favorable conditions for other species, such as oak and red maple. Understanding how tree species may be affected by changing conditions can help landowners think differently about which species to favor in their woods, with an eye toward diversifying species mixes to provide future options. This approach could have the added benefit of reducing the threat from invasive species, pests, and pathogens that are also likely to arrive with changing climatic conditions.

For the landowner whose goals include winter trails, the *Forest Adaptation Resources* tool can help as well. Shorter and warmer winters may make it more difficult for a private landowner to maintain winter ski trails in their woods. One option then is to plant conifers along the edges of the trails in select areas to shade the trail and reduce snow melt from the sun on warm winter days.

There are no easy answers to the question of how best to manage your woods with all the future unknowns, especially in the face a changing climate. But there is help. If you have a concern about how your lands may be affected and want assistance, or if you want more information, feel free to contact us. Additionally, we have more information and examples of forest adaptation in northern Wisconsin on our website: www.sharedlandscapes.org/adaptation-projects.html

Jerry Greenberg is the Vice President of Conservation for American Forest Foundation, and is based in Madison, WI.
jgreenberg@forestfoundation.org

Maria Janowiak is a scientist for climate change adaptation at the Northern Institute of Applied Climate Science and co-coordinator of the Northwoods Climate Change Response Framework project. She works with land owners and managers to use scientific information for adapting forests to changing conditions. mjanowiak02@fs.fed.us, (906)482-6303 x29

Recommended Reading

Ecosystem Vulnerability Assessment and Synthesis – A summary of information on northern Wisconsin's forests in a changing climate: www.nrs.fs.fed.us/pubs/38255

Wisconsin's Changing Climate: Impacts and Adaptation – A statewide assessment of changes on ecosystems, water, people, and more: www.wicci.wisc.edu/publications.php

Climate Change Resource Center's Climate Basics page – A starting point for more information on natural resource management and climate change: www.fs.fed.us/ccrc/climate-basics/

PIF is working with E G Nadeau of Cooperative Development Service and Pam Porter of the Biomass Energy Resource Center, in exploring our greater involvement in wood energy.

If you have an interest in this topic please contact us, as we would like your participation.

Deer: Friend or Foe of Forest Management?

by Don Peterson

Joe: It is fitting to mention deer and woodland management in this issue. The trend of warmer and drier winters has the deer populations out of hand in many areas. I know how tired I am of planting young white pine and watching the deer mow them down.

There seem to be as many different opinions about the impact deer have on forest management, as there are deer hunters. No matter what the opinion, one thing is for sure: forest management and the white tailed deer are directly connected. Forest management definitely provides a multitude of benefits for a variety of wildlife species but probably no more so than the whitetail deer. Amazingly, many of these benefits are/were not known or acknowledged by deer hunters. To this day, I meet landowners that have no interest in forest management because they only use their property for deer hunting. They truly believe that any logging activity will only be detrimental to deer. I have definitely seen this view changing for the better in my 30 plus years in forestry. More and more landowners are making the connection between forest management and deer habitat. Much of the enlightenment is due to educational/informational efforts by wildlife managers, foresters, loggers, wildlife and forest associations, and numerous other entities/individuals.

Many woodland owners have become involved in forest management because of an increase in their property taxes, which pushed them into forest tax law programs (Managed Forest Law in Wisconsin and the Commercial Forest Act and Qualified Forest Program in Michigan) requiring them to practice forest management on their properties. These programs and the management plans they require help to make the connection between forest management and the benefits it has for deer.

On the other hand, once landowners are in forest management mode they are told that deer are the culprits when it comes difficulties managing a variety of tree species because of browsing. It becomes a "catch 22". Regeneration of tree species such as Cedar, Hemlock, and Oak, which have long-term benefits for deer, can't make it past the seedling stage because of their short-term benefit as food for deer. Other tree species such as Sugar Maple, a preferred forest products species in this region, has shown a significant decline in the younger age class due to a number of factors, one of which is deer browsing.

Many current forestry practices are also not helping this situation. Smaller timber sales concentrate tree seedlings in smaller areas that are very susceptible to over browsing. Compacting logging slash and requiring low slash heights makes browsing easier for deer and eliminates protection from browsing that seedlings have had in the past. Biomass harvesting and landowners' desire for a park-like appearance further eliminates the logging slash that previously impeded browsing.

As with many things in forest management, the impact of deer is a constantly challenging and an evolving aspect that will be with us well into the foreseeable future.

Well Planned Timber Sales Really are a Value-Added Product

BY DONALD HENDERSHOT

I've come to the conclusion that one of the most over-looked "products" we can offer landowners is a well-planned timber sale. Loggers and procurement staff who buy stumpage continually evaluate timber sales on the ease of execution. Timber sales that are well-planned and executed on time leave landowners and loggers feeling confident and secure in their land management decisions. A well-planned and immediately executable timber sale is a value-added product. The need to offer this "product" is especially true in our modern logging era of pricey machinery where delays mean lost production and costly down-time.

Pre-planning a logging operation is what foresters refer to as "timber sale establishment" or "set-up". It is a bread and butter task for most private and industrial foresters. In this article I want to provide an overview of what goes into planning and setting up a timber sale. The added value is realized when the equipment arrives at the job, does it's work, and leaves in short order with the job complete and the landowner happy.

The importance of spending time with the landowner can't be emphasized enough. The planning process truly starts with open dialogue between the landowners and other stakeholders (i.e. WI DNR Foresters in the case of MFL lands). Having landowners articulate their project objectives helps ensure all parties are on the same page. Often times, foresters can discern potential problems just by listening to landowners talk about topics that are possible sources of anxiety for them such as access, property boundaries, and other aspects of the timber sale. This leads me to the next step in planning a smooth timber sale: Walk the land.

As most of us know, walk-throughs with landowners are valuable for many reasons. It's a time when ideas, concerns, and expectations can be further addressed. A picture really can be worth a thousand words when you're in the woods evaluating potential problems. In addition, the walk-through also promotes discussion on various silviculture methods, i.e. the pros and cons of thinning, selection harvesting, or clearcutting. Challenges and issues can be seen firsthand, such as difficult topography or patchy stand densities. It is also a time to further build trust and confidence with the landowner on your way to a well-planned timber sale.

So what else can help? Make sure to investigate whether or not the property has a forest stewardship plan in place. Although not every property will, it can certainly help you in the planning process if one is available. Other valuable planning tools include topographical maps, aerial photos, and online county GIS parcel maps to name a few. So, after your information gathering is complete, it's time to get out the compass, GPS, cruise stick, and of course the paint gun.

In order to establish a well-planned timber sale, it is critical to clearly designate the trees to be harvested. This means using bright paint marks on the trees at eye level

Joe:

I have grown to respect Don Hendershot from our mutual interactions on the Forest Stewardship Committee, where he represents the Wisconsin Consulting Foresters.

You may recall him in a photo in the last issue.

I appreciate Don's approach in this story, as well planned timber sales are truly a value added approach. As we often talk about adding value after the harvest, let's keep a focus on achieving maximum value while the timber is growing, prior to harvest.

or slightly above. This also ensures that property boundaries are identified and cutting boundaries are easily followed. Loggers need clear transportation routes in place for gaining access. Railroad tracks, wetlands, and creeks, as well as having to negotiate access through a neighbor's land are all issues that need to be addressed and resolved to avoid delays once logging equipment is working. Don't forget to obtain a creek crossing permit before logging equipment arrives on the job.

It is important that clean-up and close-out requirements are agreed on in advance and that expectations are realistic and achievable. As an industry, this is one area in which we repeatedly fall short. Perhaps it goes back to clearly communicating expectations. I'll share an example. During a recent job a landowner repeatedly said that he wanted as much brush as possible left hanging and laying around, "like a bomb went off". He wanted immediate deer cover. First thing he said when the logger left is "I can't believe how bad it looks and how much brush is left". Perhaps I fell short in a clear explanation of what it actually means for logging slash to be left high and scattered, as opposed to crushed and used as trail armoring. He clearly did not understand the impact of his request.

For some people, planning comes easy and they know all of the right questions to ask. Others need to think things through and adopt a systematic approach. I can't help but think back to what I've heard Coach Mike McCarthy say in post game press conferences, "We need to keep working on and improving our football fundamentals." The same mentality applies to planning a timber sale. I encourage you to apply planning fundamentals such as meeting with the landowner, walking the land, researching existing documentation, marking trees with clarity, and addressing potential access problems the next time you set up or evaluate a timber sale. This may seem simplistic to some, but if we apply the fundamentals of our game to each timber sale there will be more satisfied landowners and less operational down time. There is clearly value added to a job that has been well-planned.

YOU ARE INVITED!

The Wisconsin Headwaters Invasives Partnership Annual Partner Meeting is scheduled for *Tuesday February 26th from 9am-12pm at Trees for Tomorrow Natural Resource Specialty School, 519 Sheridan Street East.**

Eagle River, WI 54521 in Eagle River, WI!

Note that Partners in Forestry is an active partner of WHIP.

Topics will include: WHIP's past and ongoing projects, the status of other invasive cooperatives in WI and how WHIP stacks up against them, and a presentation from the WDNR to update us on the status of their state-wide invasives survey on county lands.

We will end our meeting with a group discussion to learn what our partners can provide to WHIP and what WHIP can do for you. *There will also be an optional $5 lunch at the Trees for Tomorrow Dining Hall after the meeting for more networking and discussion.

***Advance reservations required for lunch. RSVP by Friday, February 22nd**
Payment for lunch will be collected upon sign-in at the meeting.

Please join us for this important partner meeting!!!

***To RSVP for lunch or for more meeting information, contact the Oneida or Vilas County Land & Water Conservation Department:**

Ted Ritter
teritt@co.vilas.wi.us
715-479-3738

Jean Hansen
jhansen@co.oneida.wi.us
715-365-2757

continued: Photos for Maple Dieback article, Page 10, provided by Tara Bal

Dieback can be seen during leaf off times as well using binoculars to check for live twigs and buds

A sandy soil sample from a maple health plot, showing a deep E horizon, the large grey area with limited nutrients, and extremely small litter layer seen in the background

Partners In Forestry
6063 Baker Lake Road
Conover, WI 54519

Protecting your wooded land for the future is essential to clean water, clean air, wildlife habitat, sustainable wood supply…all things that are necessary to society and health, and that are gone forever if the land is developed.