

Northern Wisconsin's Forest Insect & Disease Newsletter

Wisconsin Department of Natural Resources
Division of Forestry

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Newsletter Information

You're Getting a New Forest Health Specialist in N.W. Wisconsin!

Paul Cigan plans on starting work as the new DNR forest health specialist for northwestern Wisconsin sometime in late April. He'll be based out of the Spooner ranger station. Like all of my counterparts, he'll be responsible for dealing with all things "forest health" on the non-federal land in his 9 counties. I'm really looking forward to helping Paul get started. He'll need some time to get up and running, but don't hesitate to let him know what you're challenged with in terms of forest health in northwestern Wisconsin. Please welcome him when you have the opportunity and use his help when you've got forest health problems.

Browning Conifers (not along roadways)

Hemlocks, Colorado blue spruces, Christmas plantation firs, and yews have *really* been browning quickly for the last several weeks. I first noticed this change perhaps in late February. The cause is...the cause is...[control+alt+delete]...ah that's better. I had to reboot by brain. It locked up after reading conflicting information from "reliable" sources. I guess my brain is a PC.



Figure 1: An eastern hemlock with winter injury. The section that was buried in the snow during the majority of the winter remains uninjured.

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You may have heard of winter drying, winter desiccation, winter burn, and winter scorch, but let's call this late winter browning "winter injury." Winter injury on conifers is needle damage caused by abiotic stress(es) occurring between late autumn and spring growth.

Research examining winter injury on red spruce strongly suggests winter *freeze* injury is primarily responsible for causing browning needles in the dormant season. In support of this, [Man et al. \(2013\)](#) summarize the issue beautifully: "Although desiccation has commonly been used to explain conifer needle and bud damage during the dormant season...a direct link has yet to be established." I will admit, I'm guilty of explaining this phenomenon in previous years as winter drying.

The concept with winter freeze injury is some conifer needles lose their cold hardiness during winter days with much solar radiation and very little wind. After sundown, Jack Frost quickly returns to the needle microclimate and kills the cold de-acclimated needle cells. This de-acclimatization can occur in mid-winter well before



Figure 2: Winter injury on firs (unknown species) and eastern hemlocks in Lincoln Co. The symptom severity on the side of the crowns facing the sun (A and C) are greater than the symptoms on the north-facing crowns (B and D). Note also that only the most recently grown shoots are injured on the hemlocks. This is typical of winter injury.

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symptoms are obvious. It typically occurs on only the latest year of growth on the side of the crown facing the sun. Freeze-damaged cells likely lose water quicker than living cells, so late winter warm-ups dry out freeze-damage cells quickly and exacerbate symptoms.

What will be the impact? Let's wait and see. I suspect mortality will be non-existent as long as no silly sawfly eats all the new growth. Keep in mind that along roadways, salt damage compounds the impact of the apparent freeze injury, which makes those road-side trees more susceptible to additional stressors.

This Winter's Impact on Bugs

All the gypsy moth eggs I collected back in January from Vilas and Oneida County failed to hatch in my office. I suspect the hatch failure has something to do with our cold winter. From this extremely small sample, I'll make the bold prediction that gypsy moth will not cause any noticeable defoliation in 2014 in Wisconsin's northern 18 counties.

Other than gypsy moth egg mortality from our winter, I doubt we'll notice any drastic change in our current critter cadre in northern Wisconsin. After all, the ones that have caused significant damage as of late (twolined chestnut borer, eastern larch beetle, spruce budworm) are natives and laugh hysterically when we express our opinion that thirty below is cold.

Weatherspark.com is an excellent resource to efficiently check on extreme temperatures. From November through March in major populated areas across the northern 18 counties, it looks like Tomahawk came in with the coldest recorded winter low at -32°F , followed closely by Phillips and Merrill at -31°F . Most of these temperatures are recorded at places like airports and not frost pockets, so surely some low lying areas of the Northwoods reached below those temperatures.

The following list (next page) contains insects and *examples* of their *possible* supercooling temperatures. In no way is this list official. It is illustrative. Supercooling temperatures signify when freeze-intolerant insects freeze and die. These data come from many published papers and should be taken with an enormous grain of salt because of countless variables that impact supercooling data (e.g. month, microclimate of overwintering niche, genetics, temperatures in summer and autumn, and more) and because these data are reported as means *or* extremes. When pondering this list, consider the incredible thermal buffering

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capacity of snow and ice. Unless specified, these temperatures do not necessarily signify 100% mortality:

- eastern larch beetle larval supercooling temp. in December: -56°F
- emerald ash borer prepupal supercooling temp. in November: -31°F
- forest tent caterpillar egg supercooling temp.: -45°F
- gypsy moth egg supercooling temp. uncovered by snow: -22°F for 2 days
- hemlock woolly adelgids: <2% survived in March when exposed between -22 and -13°F

Forest Tent Caterpillars in Northwest Wisconsin

Northern Wisconsin is due for a periodic [forest tent caterpillar](#) (FTC) show. Based off of what MN DNR Forest Health is [predicting for Minnesota](#), and based off of the festering FTC activity in N.W. Wisconsin for the last 3 years, I'm guessing Douglas, Burnett, and Polk will be the first northern Wisconsin counties to welcome back significant numbers of caterpillars since 2002. Will they be noticed in 2014? We will know shortly. Look for noticeable defoliation and caterpillars in later May or early June.



Figure 3: A forest tent caterpillar in mid-June.

Forest Health Links

- A reference for recognizing [insect galleries in ash](#) from Minnesota
- April 30th [forestry pesticide training](#) in Stevens Point
- Bad news for [monarchs](#) in March 2014
- Plight of the [monarchs](#) in 2013
- Why Bees are Disappearing: [TED talk](#) from U. of Minnesota research entomologist.
- [Oak wilt infection risk](#) is high between April 15 and July 15 in northern Wisconsin
- ALB has greater success on [red maples](#)
- Bad breath and [toxic barf](#): caterpillar defense tactics
- [Oriental bittersweet](#): a sweet pub. from our neighbors to the west

Forest Health Web and Phone Resources

- Insects
 - [Emerald Ash Borer](#)
 - * EAB Hotline—1-800-462-2803
 - [Gypsy Moth](#)
 - * Gypsy Moth Hotline—1-800-642-MOTH
 - Tracking Insect Pest Damage: [Forest Health Portal](#)
- Diseases
 - [Annosum](#) Root Rot (Heterobasidion Root Disease)
 - [Oak Wilt](#)
 - Tracking Disease Damage: [Forest Health Portal](#)
- Plants
 - [Timing of Herbicide](#) Applications for Planted Trees
 - Invasive Plant [Control Database](#)
- Sick Tree Diagnostic Keys:
 - U. of Minnesota Extension—[What's Wrong With My Plant?](#)
 - U. of Wisconsin Extension [Green Industry Website](#)

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Note: This pest report is an informal newsletter and covers forest health issues in the northern 18 counties of Wisconsin. The purpose of this newsletter is to provide forest owners and managers in Northern Wisconsin with regional up-to-date forest health information. I welcome your comments/suggestions on this newsletter *and your reports on forest health problems you observe in your area*. If you would like to subscribe to this newsletter, please contact Brian Schwingle at brian.schwingle@wisconsin.gov. Previous issues of this newsletter and regional forest health updates from other Wisconsin regions are available at <http://dnr.wi.gov/topic/ForestHealth/Publications.html>.