

Elongate Hemlock Scale and Boxwood Blight: Emerging Invasive Threats to Wisconsin's Christmas Tree Growers

▶ Brooke Sanneh
Christmas Tree Program Coordinator

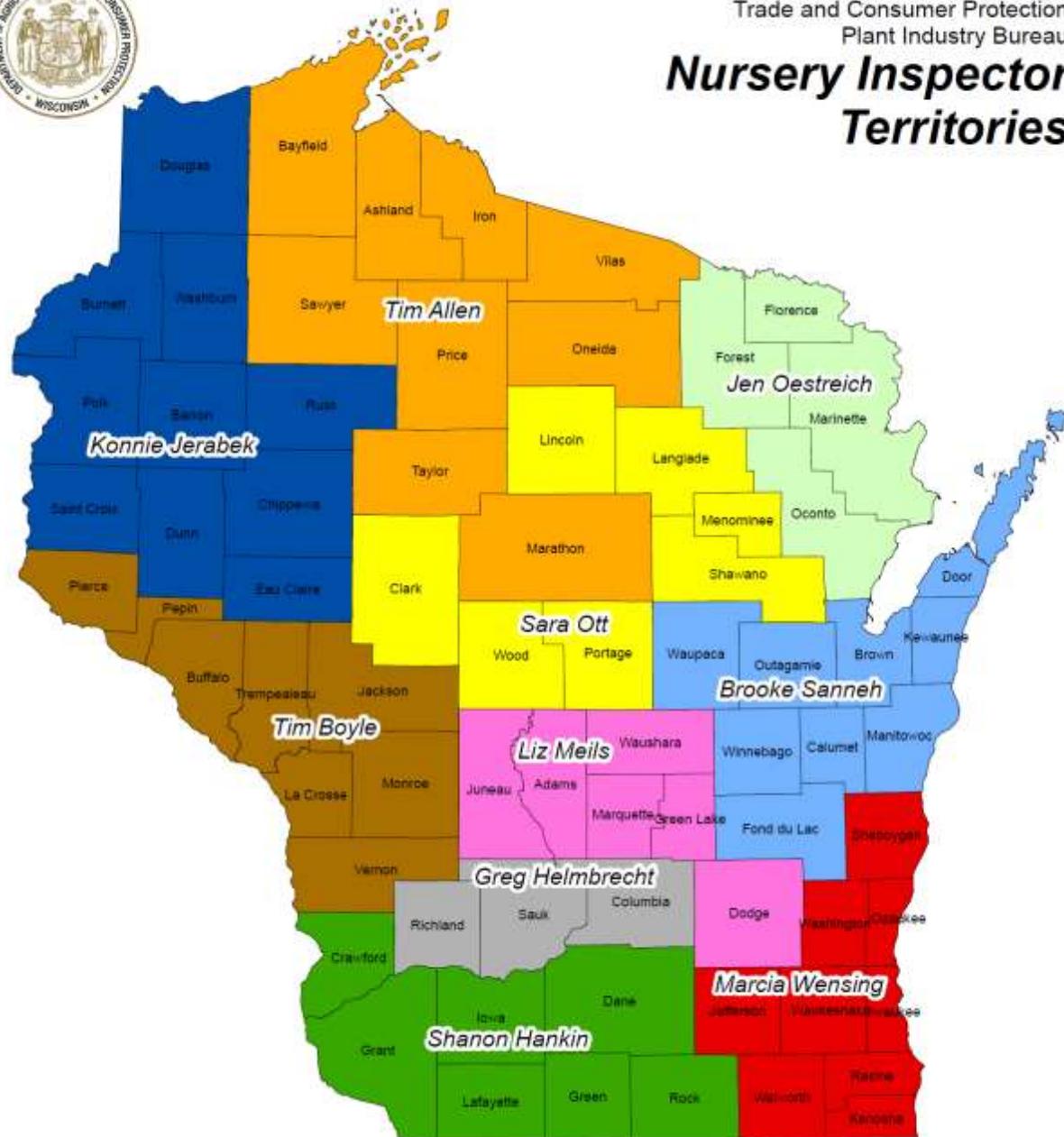
Wisconsin Department of Agriculture
Trade and Consumer Protection





Wisconsin Department of Agriculture,
Trade and Consumer Protection
Plant Industry Bureau

Nursery Inspector Territories



10 staff are assigned regional nursery inspection territories

Northern Unit Supervisor Jen Oestreich covers four NE Counties

Christmas tree inspection territories vary based on annual workload

A seasonal LTE assists with SE WI and group Xmas inspections

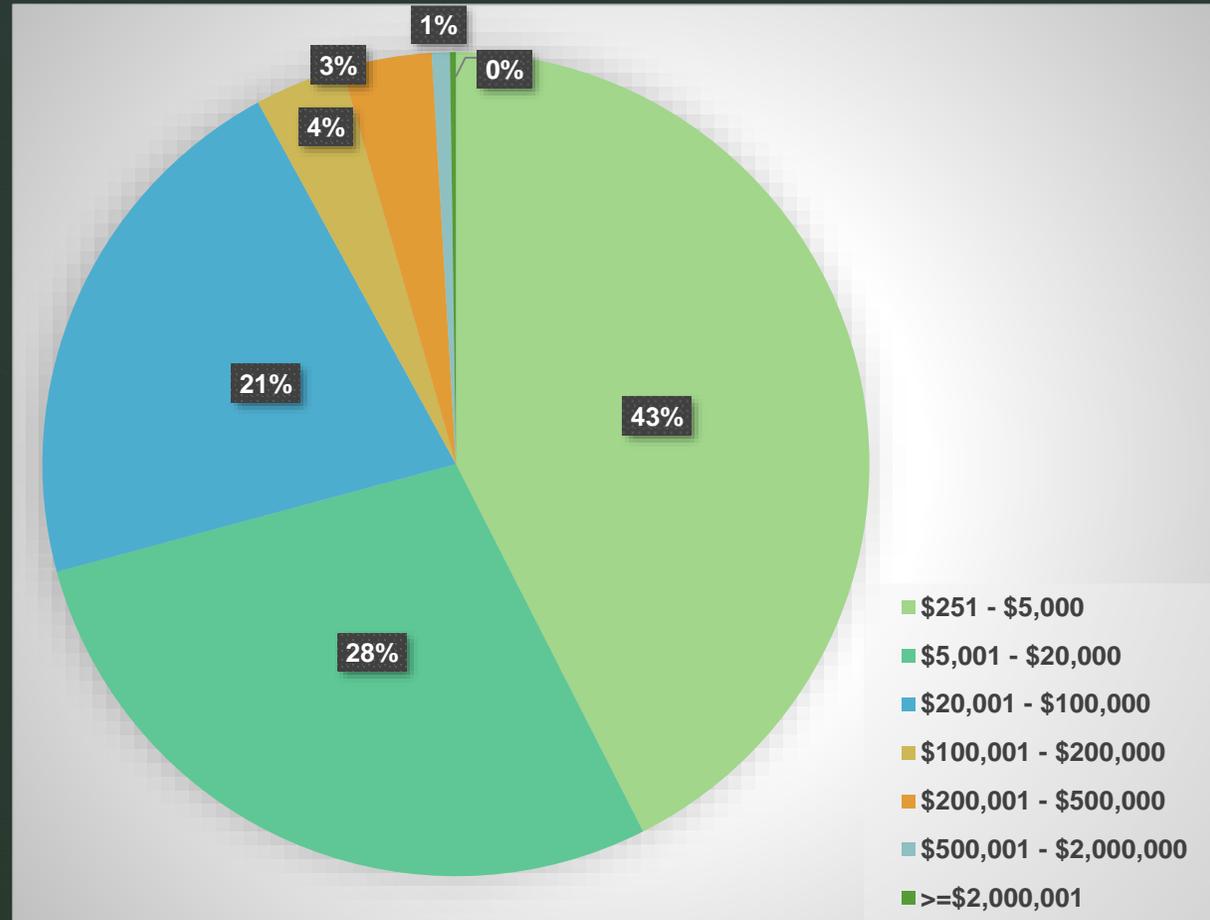
https://datcp.wi.gov/Pages/Programs_Services/NurseryChristmasTreeInspection.aspx

Christmas Tree Licensing in Wisconsin



- DATCP had 428 licensed Christmas tree growers as of 01/04/19
- Growers must be licensed if Christmas tree sales exceed \$250 / year
- Licenses cost \$20 - \$900 / year and expire on February 20 each year
- Licenses support inspection work. Inspections facilitate exports and interstate shipping and include management recommendations.
- Growers can now apply for licenses and pay online <https://mydatcp.wi.gov/>

License Levels of Wisconsin Christmas Tree Growers in 2018



2018: We had 428 licensed growers who paid \$26,735 in license fees, plus \$5,000 in PHCs. Revenue helps support Program Costs.

Christmas Tree Field Inspections

Inspections conducted Sep - Nov

- Interstate shippers, wholesale growers, and growers with plant health certificates inspected annually by October 15
- Other growers inspected once / 3 years
- DATCP inspected 511 Christmas tree growing fields in 2018 (45 had gypsy moth)

Goals:

- Ensure trees are free from regulated pests (Gypsy moth and pine shoot beetle)
- Document pests and diseases
- Provide lab confirmation, management recommendations



Gypsy Moth, *Lymantria Dispar* (Lepidoptera: Erebidae)



- Native to Europe and North Africa
- Introduced by Leopold Trouvelot into Medford, MA in 1869, gypsy moth feeds on over 300 species, prefers oak, willow, apple, aspen, birch, basswood, tamarack, and linden
- Larvae hatch and feed in May, molt 4-5x before pupating; adults emerge/mate in July; white flightless females lay buff egg masses (on trees, vehicles, etc.)

Gypsy Moth Impacts

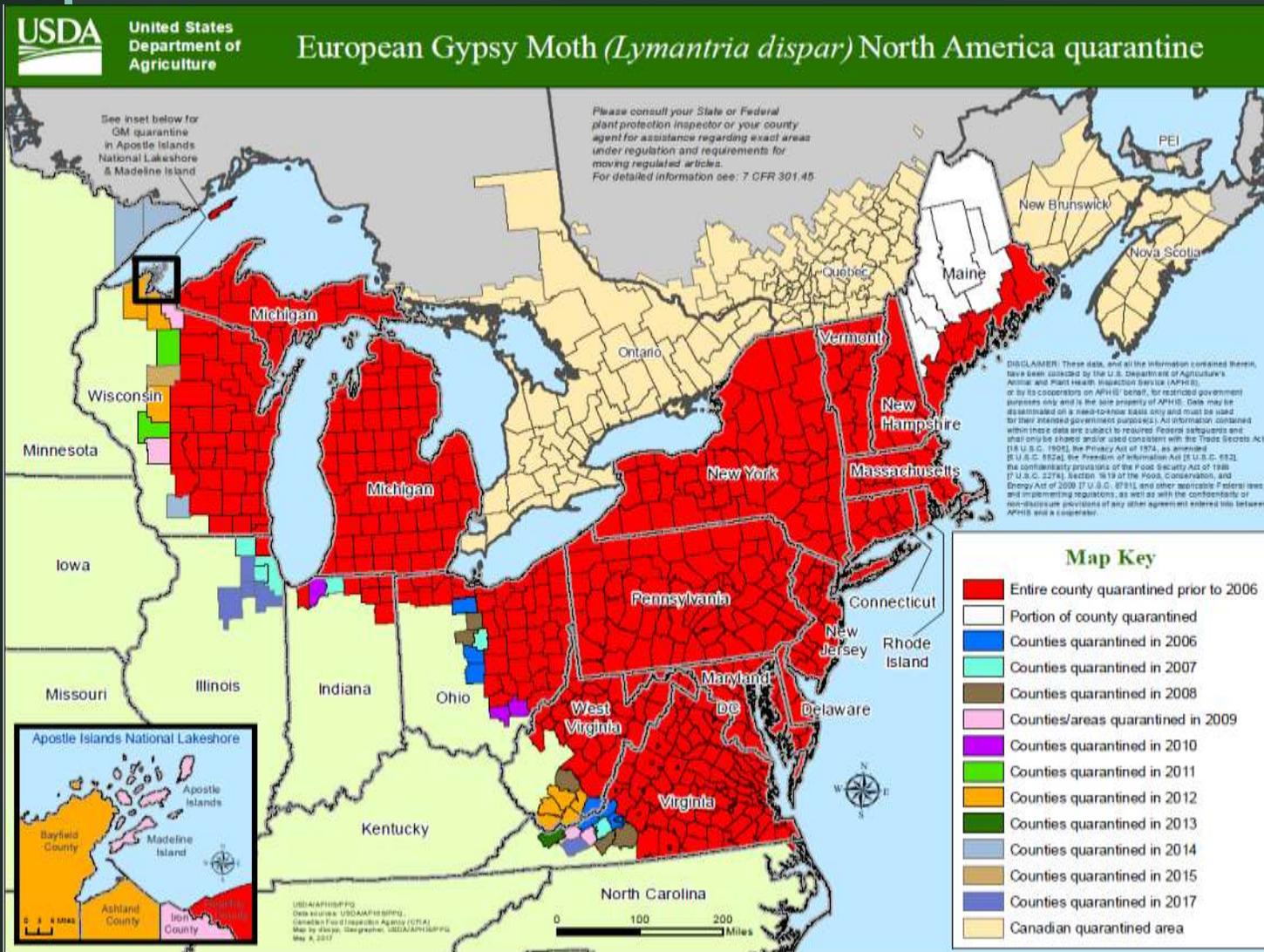


Photo by Bill McNee, WDNR, 2010



- **Gypsy moth has defoliated over 75 million acres since 1970**
- **Egg masses can contain up to 1,000 eggs. Each larvae can eat one square foot of foliage per day**
- **Repeated defoliations of hardwoods (and single defoliations of conifers) can lead to mortality; decline, and increased susceptibility to insects and diseases**
- **Gypsy moth infestations can lower property values (if severe, repeated)**

Gypsy Moth Quarantine



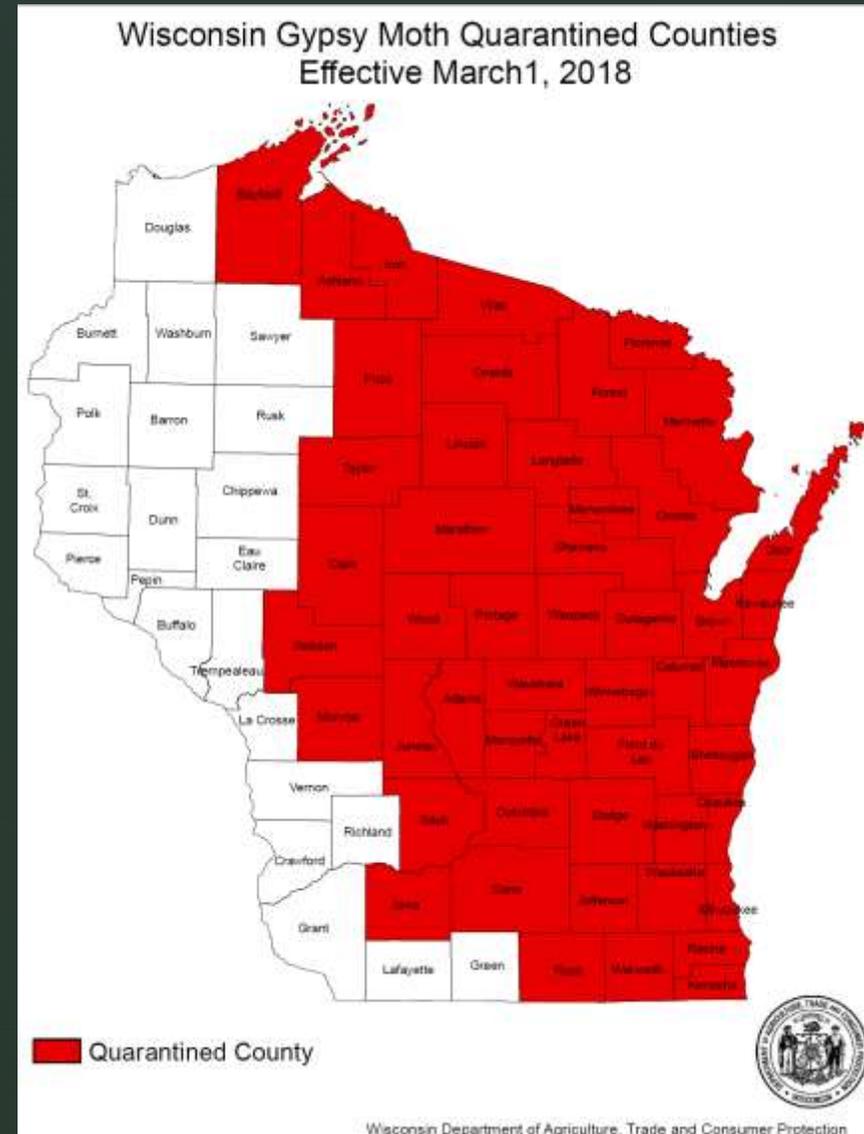
- Shipping outside a quarantine county requires a field inspection and a USDA-APHIS Compliance Agreement (no charge)
- If gypsy moth is detected in or near your field
 - Don't move trees within a specified area of the field outside the GM quarantine.
 - Treat field with approved pesticide the following spring.

Gypsy Moth Quarantine

50 of Wisconsin's 72 counties are quarantined for gypsy moth

Christmas trees or nursery stock shipped out of the quarantined area (or out of state) are required to have a Compliance Agreement (CA)

USDA APHIS issued 123 (interstate) GM CAs in 2018



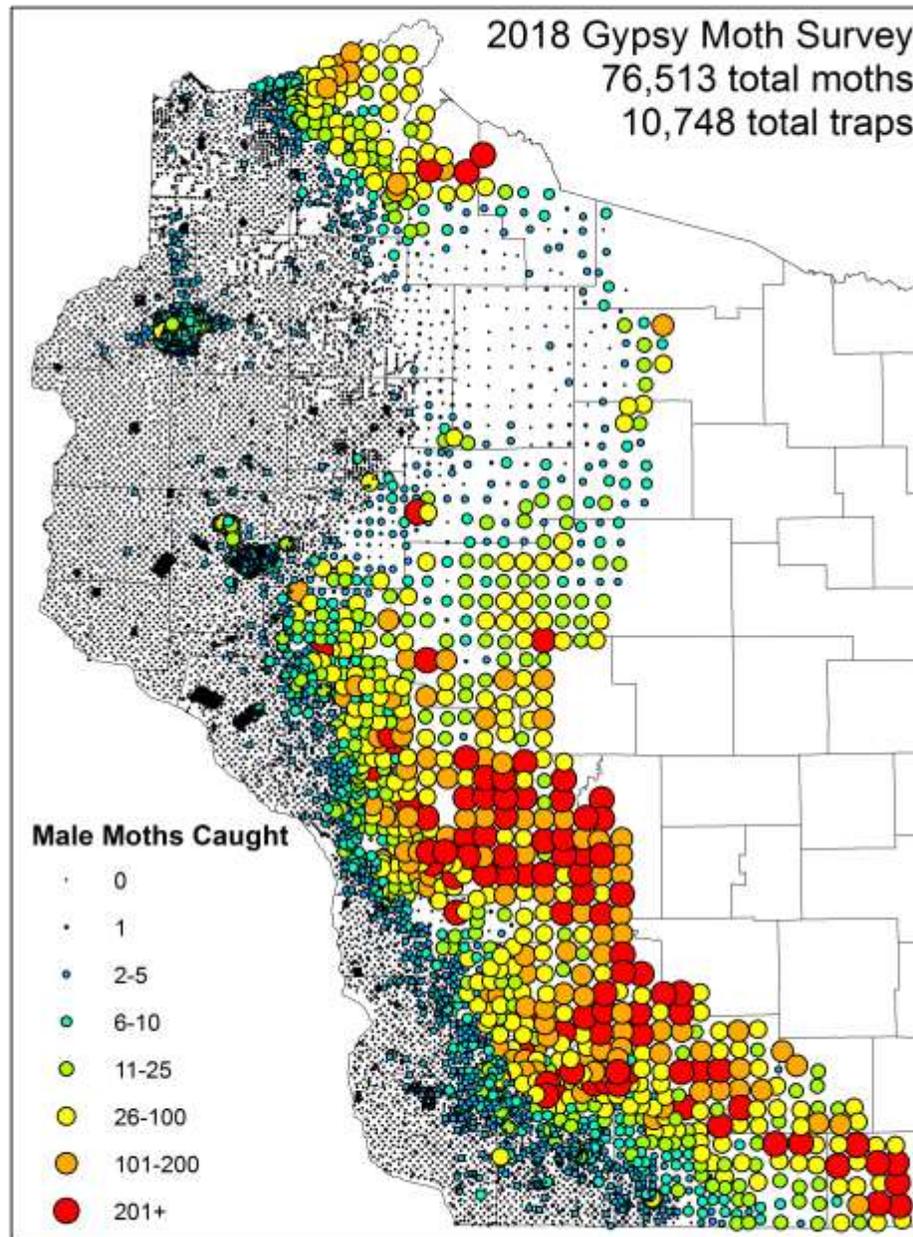
Christmas Tree Inspectors Scout Perimeters of Fields for Gypsy Moth



DATCP Staff Trap for Gypsy Moth in Slow the Spread Zone (Western WI)



- DATCP set 10,748 gypsy moth traps in western Wisconsin in 2018
- Catch directs slow-the-spread treatments that reduce gypsy moth impacts along the leading edge of infestation, and helps make decisions about quarantine boundaries.
- 56 traps were set at lumber mills in Western WI.



DATCP caught 76,513 male moths in 2018

Catch decreased 30% from 109,333 in 2017 (possibly due to prolonged cold winter temperatures in Northern, Central WI).

Some areas still had locally high trap numbers

Pine Shoot Beetle, *Tomicus piniperda*



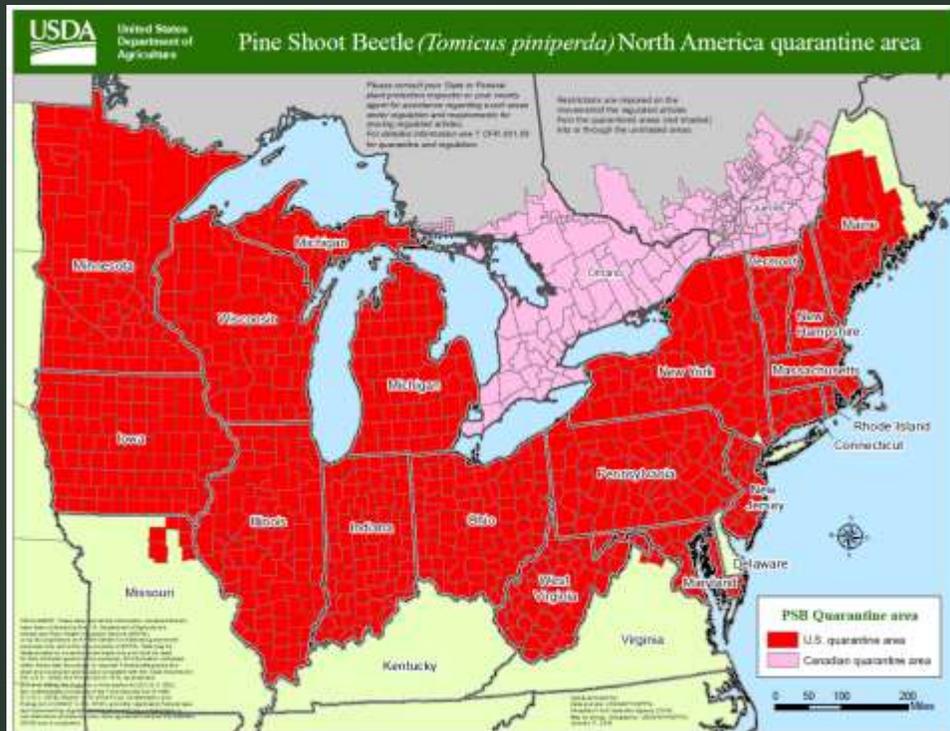
Pine Shoot Beetle is native to Europe, Africa, and N Asia

Causes pine dieback, yellowing, and dead, bored-out shoots

Since its discovery in OH in 1992, it has been found in 20 states

All WI counties federally quarantined for this pest since 2006

PSB Detected in Christmas tree fields in Dane, Jefferson, Milwaukee, Ozaukee, Sheboygan, Taylor, Walworth and Waukesha counties in 2017; PSB detected in Ozaukee Co (1 field) in 2018



Most Common Christmas Tree Insects / Pests: 2018 Field Inspections

Insect or Pest	Number of Field Detections
Balsam twig aphid (<i>Mindarus abietinus</i>)	125
White pine weevil (<i>Pissodes strobi</i>)	56
Deer browse/damage (<i>Odocoileus virginianus</i>)	38
Balsam gall midge (<i>Paradiplosis tumiflex</i>)	21
Zimmerman pine moth (<i>Dioryctria zimmermani</i>)	19
Allegheny mound ant (<i>Formica exsectoides</i>)	16
Pine needle scale (<i>Chionaspis pinifoliae</i>)	14
Spruce spider mite (<i>Oligonychus ununguis</i>)	14
Pales weevil (<i>Hylobius pales</i>)	10
Aphids (<i>Cinara spp. or Eulachnus agilis</i>)	9

Most Common Christmas Tree Diseases / Abiotic Stressors: 2018 Field Inspections

Disease or Abiotic Stressor	Field Detections
Winter injury	68
Broom rust of fir (<i>Melampsorella caryophyllacearum</i>)	64
White pine blister rust (<i>Cronartium ribicola</i>)	55
Lirula needlecast (<i>Lirula nervata</i> , <i>Lirula mirabilis</i>)	53
Root rot	48
Mortality	41
Needlecast	38
Chlorotic	33
Rhizosphaera needlecast of spruce (<i>Rhizosphaera kalkhoffi</i>)	31
Rhizosphaera needle blight of fir (<i>Rhizosphaera pini</i>)	29
Eastern (Pine-Oak) gall rust (<i>Cronartium quercuum</i>) / Western (Pine-Pine) gall rust (<i>Peridermium harknessii</i>)	17

Christmas Tree Sales Lot Inspections

- Thanksgiving to Christmas
- Goals:
 - Ensure trees are free from regulated pests
 - Survey for all pests & diseases
 - Find unlicensed growers
 - Inspect certificates for trees from out-of-state, gypsy moth quarantine



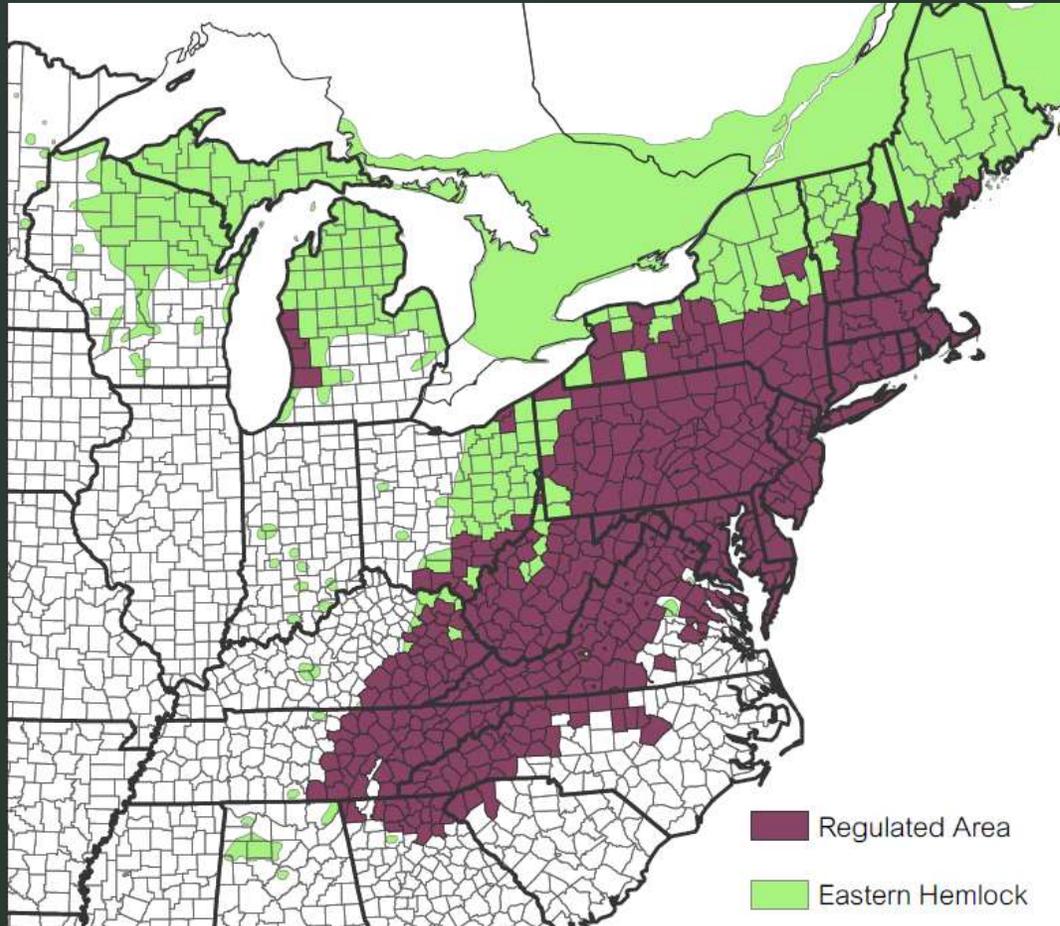
Christmas Tree Lot Inspection Results

Insect or Disease	2017	2018
Balsam Gall Midge (<i>Paradiplosis tumiflex</i>)	3	2
Balsam Twig Aphid (<i>Mindarus abietinus</i>)	18	11
Broom Rust of Fir (<i>Melampsorella caryophyllacearum</i>)	3	3
Eastern / Western Pine Gall Rust (<i>Peridermium harknessii</i>)	4	2
Eastern Spruce Gall Adelgid (<i>Adelges abietis</i>)	3	1
Elongate Hemlock Scale (<i>Fiorinia externa</i>)	3	19
Lirula Needlecast (<i>Lirula nervata</i> , <i>Lirula mirabilis</i>)	1	1
Native Hemlock Scale (<i>Abgrallaspis ithacae</i>)	14	0
None	71	41
Pine Needle Scale (<i>Chionaspis pinifoliae</i>)	16	6
Rhizosphaera Needle Blight of Fir (<i>Rhizosphaera pini</i>)	2	3
Rhizosphaera Needlecast of Spruce (<i>Rhizosphaera kalkhoffi</i>)	1	1
White Pine Blister Rust (<i>Cronartium ribicola</i>)	0	1
White Pine Weevil	0	1
Other: chlorosis, feeding, brown spot needle blight, needlecast, winter burn, Zimmerman pine moth, black scale, etc.	6	3

DATCP conducted 75 Christmas tree lot inspections in 2018

Hemlock Woolly Adelgid, HWA

Adelges tsugae



Native to Asia – does not kill hemlocks in its native range, or in Western US.

HWA is an invasive, aphid-like insect that feeds at base of needles; killed hemlock across 20 eastern states.

HWA is not found in WI. DATCP's exterior quarantine, ATCP 21.16, restricts hemlock nursery stock from infested areas (in purple). Hemlock range shown in green.

HWA only occurs on hemlock trees; often co-occurs with EHS

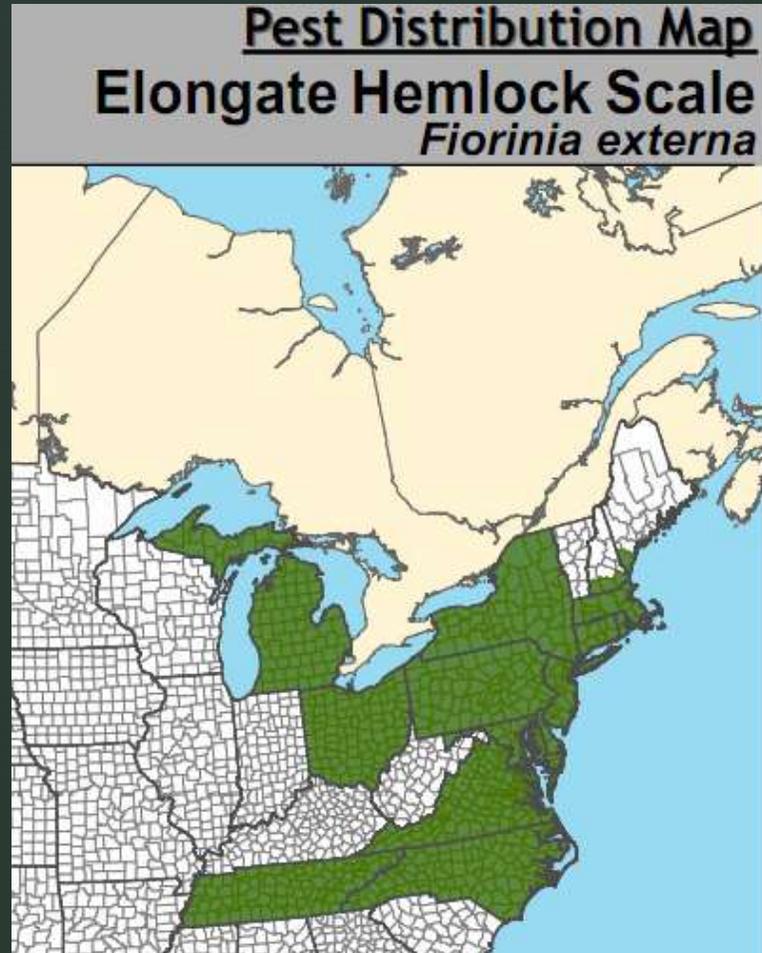
▶ Elongate Hemlock Scale



- Females are immobile, have brown scale coverings, lay up to 20 yellow eggs
- Males have white coverings and wings; do not feed
- Crawlers are mobile; may start new infestations



Elongate Hemlock Scale



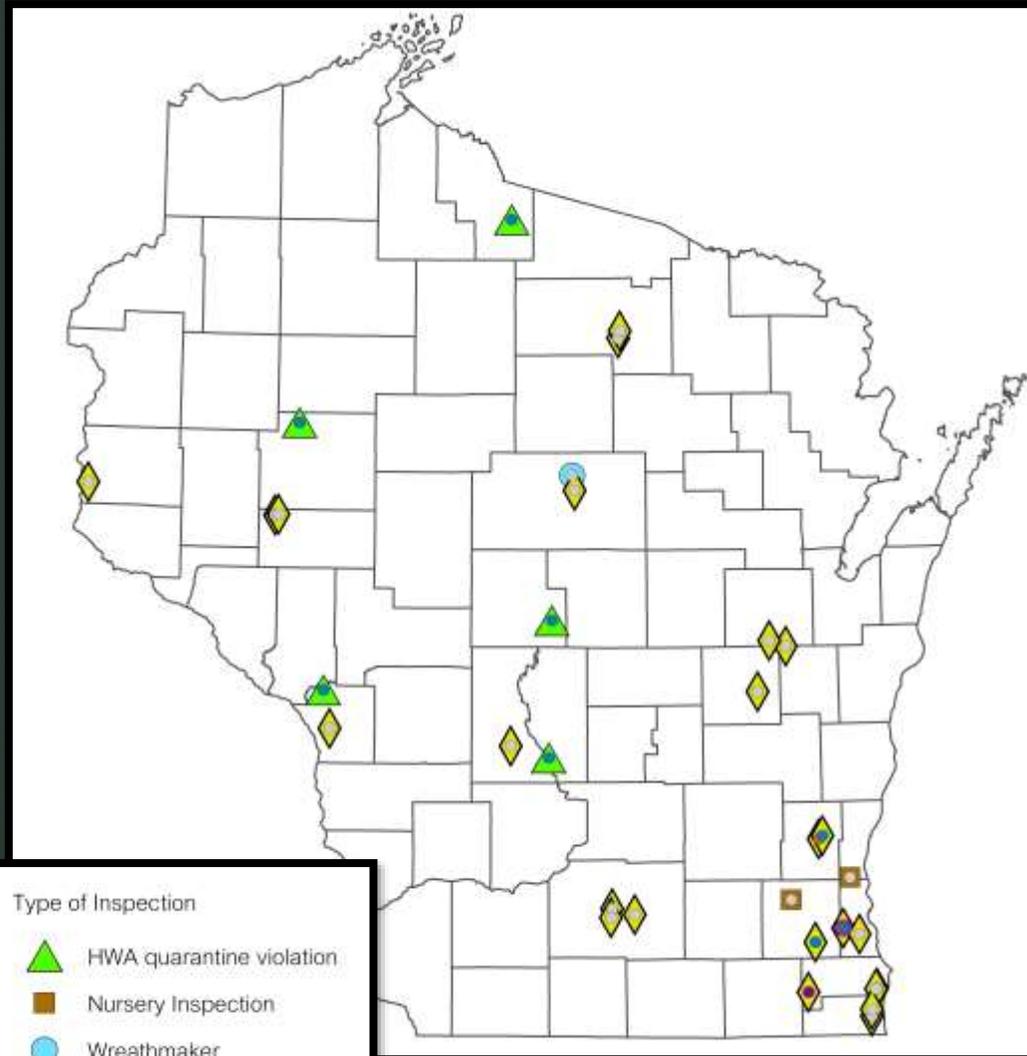
- Elongate Hemlock Scale, *Fiorinia externa* (EHS) is an invasive armored scale insect
- EHS can occur on 43 conifer species, including hemlock (often with HWA), fir, and spruce.
- EHS feeding leads to needle drop and decline.
- Native to Asia, EHS has been introduced into at least 16 states.
- EHS is hard to control with pesticides, as scales are protected under waxy coverings, generations overlap, and crawlers emerge year-round.

▶ Elongate Hemlock Scale



- EHS is not known to be established in Wisconsin.
- DATCP inspectors check for EHS during Christmas tree field inspections, and DNR has inspected for this pest on hemlocks on public land.
- DATCP has detected EHS on cut Fraser and balsam fir Christmas trees and boughs, in wreaths and other décor, and on hemlock nursery stock

Elongate Hemlock Scale: 2014-18 Detections



EHS has never been detected in a WI Christmas tree field.

DATCP has detected EHS 33 times during inspections in 19 Wisconsin counties from 2014-18.

Nursery and HWA quarantine detections on hemlock trees – treated or destroyed

Xmas lot detections on cut Fraser and balsam fir trees, wreaths, and other décor

Elongate Hemlock Scale: Summary of Detection and Response by Year

Year	Description
2014	One EHS detection on cut fir trees at Christmas tree lot in Milwaukee Co., 12/12/14; Material from Newland, NC
2015	One EHS detection on cut fir trees at Christmas tree lot in Washington Co., 12/09/15
2016	One EHS detection on cut fir trees at Christmas tree lot in Racine Co., 12/02/16
2017	Five EHS detections on hemlock nursery stock in April – May 2017 (shipped from TN in violation of HWA quarantined); Two detections on fir wreaths and one detection on fir trees at Christmas tree lots in Milwaukee, Washington, and Waukesha counties.
2018	Two detections on hemlock nursery stock from PA on 05/29 and 07/26/18. Material destroyed or treated and released for sale. Nineteen detections on cut Fraser and balsam fir trees, wreaths, and other décor from four different NC sources from Xmas lot inspections conducted from 11/20 – 12/17/2018. One detection on boughs purchased by a wreath maker in Marathon Co. from a VA source on 11/21/18.

Elongate Hemlock Scale



- Over a Dozen Infested cut fir products (wreaths, boughs, swag, mugs, sleighs, porch pots, hanging baskets, floral arrangements) detected at big box and grocery stores
- Pest abatement orders issued at each location where detections were made. Retailers disposed of products in dumpster or burned, or removed fir from arrangements.
- Letters written to live plant buyers of chain stores asking them to remove products from all WI locations. Good cooperation overall.

Boxwood Blight



- Boxwood blight is a fungal disease caused by *Calonectria pseudonaviculata*, that is found in Europe and over 24 US states.
- It was first detected in WI in boxwood grown at a nursery in SE WI in July 2018 (but it has not been found anywhere else).
- It is a persistent pathogen that causes defoliation, and can remain in soil.
- Once boxwood are infected there is no cure.
- On 11/21/18, DATCP sent a Press Release warning shoppers not to compost boxwood wreaths after the holidays if they came from areas with boxwood blight, as this could introduce the disease to new areas.

Boxwood Blight



One of the same NC growers that shipped wreaths with EHS also shipped boxwood wreaths infected with boxwood blight to Trader Joe's nationwide

Trader Joe's quickly recalled material from store shelves.

Inspectors found no infected boxwood for sale at the three Trader Joe's in Wisconsin.

https://datcp.wi.gov/Pages/Programs_Services/BoxwoodBlight.aspx

Summary of DATCP's EHS Outreach

2017:

- **Provided EHS info to WI wreathmaker, obtained fir from NC.**
- **Contacted source nursery and Depts. of Ag. about HWA and EHS concerns**

2018:

- **Wrote letter to WI wreathmakers, included EHS pest alert and concerns.**
- **Wrote EHS article for WCTPA magazine (Oct)**
- **Amazon shipping Fraser fir from NC prompted us to send concerns to Dept. of Ag.**
- **Sent press releases about the boxwood blight and EHS on imported wreaths (11/21/18) and about disposing of EHS-infested fir wreaths and décor (12/26/18)**
- **Communicated with DNR and sanitation staff about allowing fir infested with EHS, an invasive injurious pest, to be burned or landfilled to prevent establishment**

Elongate Hemlock Scale Media Response

DATCP's EHS Facebook post reached 404,019 people

- 94,620 engaged with it
- 107 commented
- 4,994 shared it

EHS Web views:

- 4,591 different people looked at the EHS webpage:
https://datcp.wi.gov/Pages/Programs_Services/EHS.aspx
- 1,849 different people looked at the press release on our webpage
- 933 people opened the emailed press release, multiple times – a total of 4,343 opens.

Media coverage included the [WI State Journal](#), [Duluth News Tribune](#), [WSAW TV](#), [The Star Tribune](#), [La Crosse Tribune](#), [WPR](#), and more.

Wisconsin Christmas Tree Growers were key in communications with the media, made it clear that we don't have and don't want this invasive introduced pest in our state.



Elongate Hemlock Scale: How to Protect Wisconsin Conifers from this Invasive Pest?



Buy stock grown in Wisconsin or other states where EHS has not been found

Let suppliers know that you will not accept stock infested with EHS or other pests

Watch for any sign of EHS and report suspect EHS on trees to DATCP, using contact information in the box at right

Dispose of infested material by burning or landfilling

EHS has been nominated for inclusion on the next iteration of NR 40, DNR's Invasive Species Rule

Wisconsin could propose an exterior quarantine on EHS (via ATCP 21). This would involve numerous stakeholders and take years.

Thank You! Questions?



Brooke Sanneh

Christmas Tree Program Coordinator, Plant Industry Bureau
Wisconsin Department of Agriculture Trade
and Consumer Protection
brooke.sanneh@wisconsin.gov
(608) 235-7861