



# Invasive Species in the Northwoods: Plants, Critters, and Disease Updates



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Wisconsin Headwaters Invasives  
Partnership (WHIP)**

Sustainable Forestry Conference, Florence, WI April 20, 2017

# WHIP:

Wisconsin Headwaters Invasives Partnership

# CISMA:

Cooperative Invasive Species Management Area

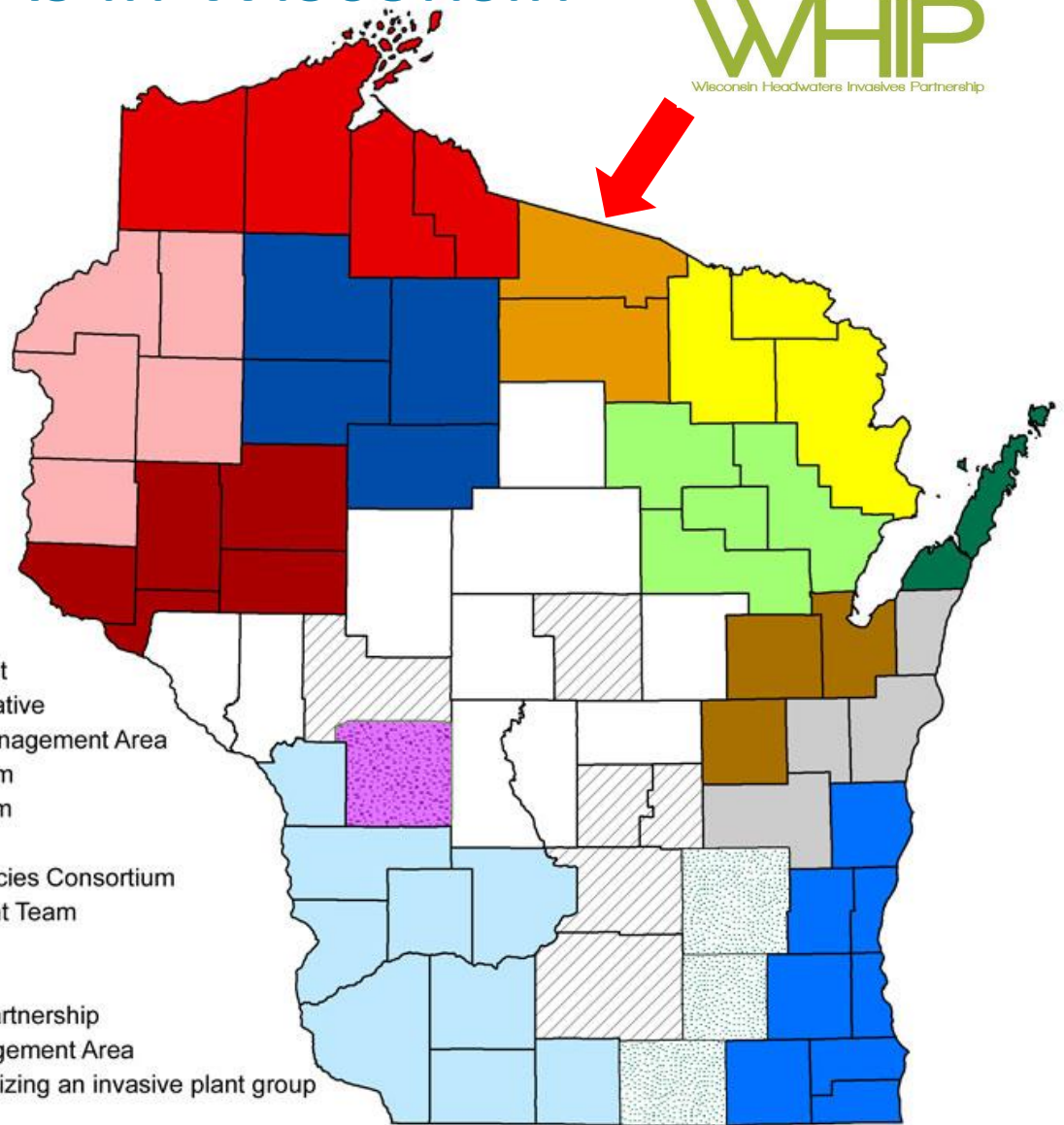
- Groups working to control invasive species across boundaries
- Typically grant-supported, with strong volunteer base, have Steering Committees, and a Memorandum of Understanding
- Our fiscal sponsor is the Lumberjack Resource Conservation & Development Council (RC&D)
- **MISSION: Pool available resources to foster public awareness and to implement programs to control and manage these species.**



# CISMAs in Wisconsin

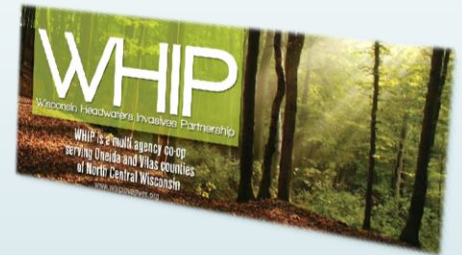


- Timberland Invasives Partnership
- SW Weed Management Area
- St. Croix Red Cedar CWMA
- Previously active, currently dormant
- BOWON Invasive Species Cooperative
- West Central WI Invasive Plant Management Area
- Door County Invasive Species Team
- Monroe County Invasive Plant Team
- North Woods CWMA
- Southeast Wisconsin Invasive Species Consortium
- Greater Sauk County Invasive Plant Team
- Upper Chippewa CWMA
- Wild Rivers CWMA
- Wisconsin Headwaters Invasive Partnership
- Lakeshore Invasive Species Management Area
- Some residents interested in organizing an invasive plant group
- No regional invasive plant group



# Our Formal Partners

- Lumberjack Resource Conservation & Development Council
- Natural Resource Conservation Service
- United States Forest Service, Chequamegon-Nicolet National Forest
- Partners in Forestry
- Trees for Tomorrow- Natural Resource Specialty School
- Wisconsin Department of Natural Resources
- The Nature Conservancy
- Conserve School
- Board of Commissioners of Public Lands
- Oneida County Land & Water Conservation Department
- Vilas County Land & Water Conservation Department
- Great Lakes Indian Fish & Wildlife Commission
- Northwoods Land Trust
- Wisconsin Department of Transportation
- Lac du Flambeau Band of Lake Superior Chippewa Indians
- = 15 currently





# How do you define an invasive species?

- ▶ A **native** species is a plant or animal that lives in a location/habitat without human intervention.
- ▶ An **alien** species is a plant or animal introduced into a new habitat and may remain harmless or may become aggressive
- ▶ An **invasive** species outside its natural range is not limited by the same system of checks and balances to keep the population under control (predators, parasites), so it will spread. Species are **invasive** if they cause harm to the ecology, economy, or human health of the new environment.
- ▶ Why? They establish and reproduce quickly, disperse easily, adapt easily to a range of temperatures and conditions, prevent natives from growing...



# How Do Terrestrial Invasives Spread?

- Wind—seeds are lightweight and plentiful
- Water—from headwaters to larger waterbodies
- Wildlife—birds may spread seeds far and wide
- Human-mediated pathways:
  - Roadways
  - Transport of firewood, soil, plants
  - Recreation: hiking boots, bikes, ATVs, pets!!



# Types of Problems Caused by Invasive Species in Wisconsin



Photo: [www.stopthebeetle.info](http://www.stopthebeetle.info)

## Ecology

- Native ecosystems are disrupted by invaders
- Wetlands dry up, ditches choked
- Shrubs can shade out native wildflowers and saplings
- Without predators, invasives can overtake native species

## Health:

- Wild Parsnip, Giant Hogweed



## Economics:

- In the U.S., costs of control and damage estimated at \$137 billion per year
- Property values on lakes with Eurasian water milfoil decrease by 20%
- Forestry industry hurt by pests, insects lower crop yields and shrubs like honeysuckles and Buckthorn prevent regeneration of young native trees
- Tourism industry is affected wherever invasives prevent hiking or enjoyment of lakes, or lower property values



# Invasive Species Impacts on Forestry

- Invasive insects and diseases have had a significant, negative impact on important tree species ...
- The **American chestnut (*Castanea dentata*)**, once one of the most abundant tree species in eastern U.S. hardwood forests and one of high economic importance. After the chestnut blight (a fungus) was accidentally introduced on nursery stock from Asia in the late 1800s, few chestnut trees remained.
- **American elm (*Ulmus americana*)** was once a major component of hardwood forests across the eastern half of the United States and a popular street tree in the eastern United States until the 1930s when an Asian fungus was introduced on European logs. Spread by beetles, the fungus had killed the majority of elm trees by 1980.
- *From: "Non-native Invasive Species Best Management Practices Guidance for the U.S. Forest Service Eastern Region (2012)"*



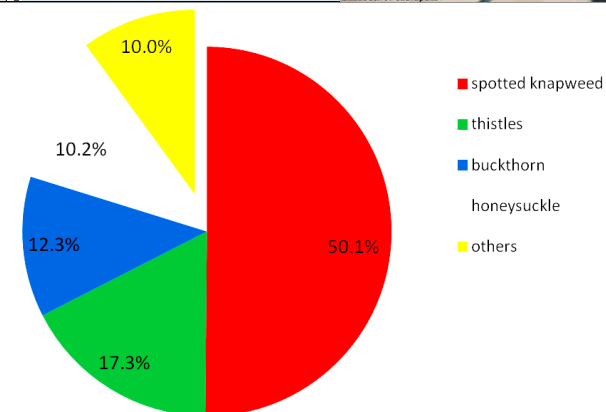
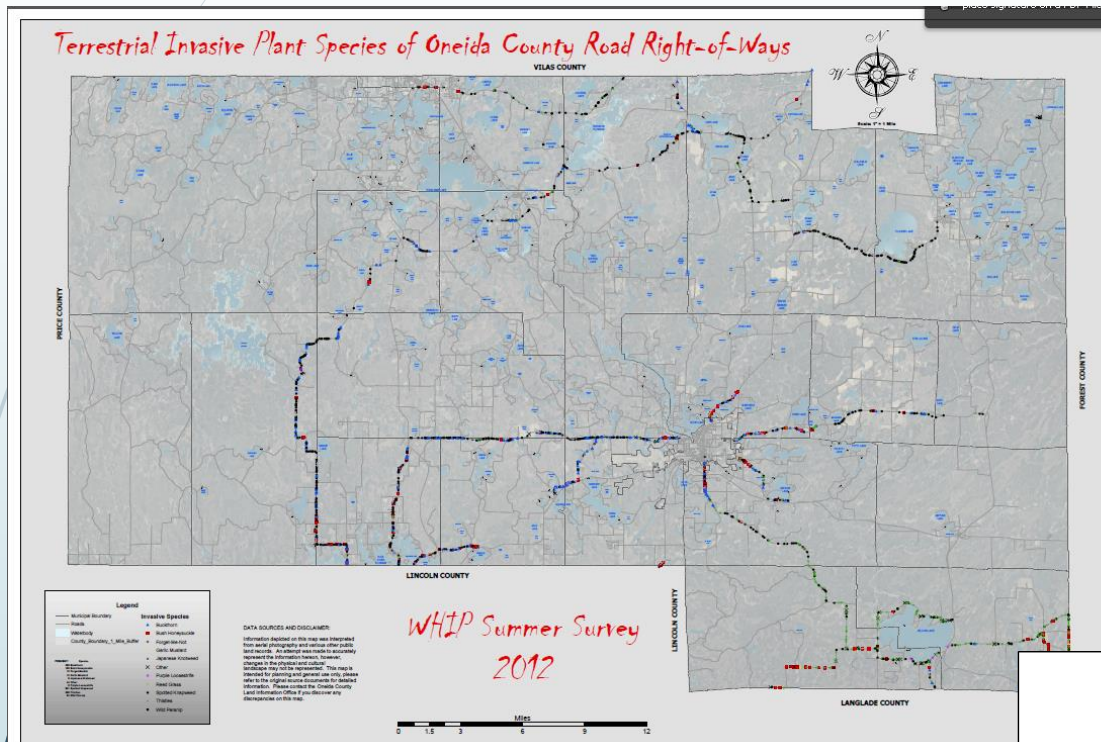
# Invasive plant impacts on wildlife...

- Invasive plants such as honeysuckles and Buckthorn shade out young oak trees, leading to fewer acorns for turkeys, grouse, and deer
- Reed grass (*Phragmites*) dries up wetlands for waterbirds
- Japanese Barberry harbors very high populations of ticks because it creates moist cool understory
- Songbirds will eat Buckthorn berries as a last resort and they are very hard on the birds digestion, leaving them weak and dispersing seeds



# How common are these invasives out there?

## County Road Right-of-way Surveys



# Prioritizing Invasive Species: distribution, abundance, and threat

1. **Early Detection and Response:** species that exist only in isolated, scattered populations; have **high priority** for early detection efforts to slow their spread.

| Common Name                  | Scientific Name              | Status in Wisconsin              | Management Objective                  |
|------------------------------|------------------------------|----------------------------------|---------------------------------------|
|                              |                              | R = Restricted<br>P = Prohibited | Contain, Control, Eradicate, or Other |
| Early Detection and Response |                              |                                  |                                       |
| Wild Chervil                 | <i>Anthriscus sylvestris</i> | P                                |                                       |
| Common Reed (non-native)     | <i>Phragmites australis</i>  | P/R<br>(R in WHIP area)          |                                       |
| Oriental Bittersweet         | <i>Celastrus orbiculatus</i> | R                                |                                       |
| Wild Parsnip                 | <i>Pastinaca sativa</i>      | R                                |                                       |
| Garden Valerian              | <i>Valeriana officinalis</i> | R                                |                                       |
| European Marsh Thistle       | <i>Cirsium palustre</i>      | P/R<br>(R in WHIP area)          |                                       |
| Butterfly Dock               | <i>Petasites hybridus</i>    | P                                |                                       |
| February Daphne              | <i>Daphne mezereum</i>       | not regulated                    |                                       |
|                              |                              |                                  |                                       |



**2. Priority Management:** Species known to negatively impact natural areas, making control and management necessary (ongoing).

| Priority Management                                 |                                                                               |   |  |
|-----------------------------------------------------|-------------------------------------------------------------------------------|---|--|
| Glossy Buckthorn                                    | <i>Frangula alnus</i>                                                         | R |  |
| Common Buckthorn                                    | <i>Rhamnus cathartica</i>                                                     | R |  |
| Garlic Mustard                                      | <i>Alliaria petiolata</i>                                                     | R |  |
| Purple Loosestrife                                  | <i>Lythrum salicaria</i>                                                      | R |  |
| Japanese Knotweed                                   | <i>Polygonum cuspidatum</i>                                                   | R |  |
| Yellow Flag Iris                                    | <i>Iris pseudacorus</i>                                                       | R |  |
| Eurasian Honeysuckles                               | <i>Lonicera tatarica</i> ,<br><i>L. morrowii</i> , <i>L. x bella</i>          | R |  |
| Leafy and Cypress Spurge                            | <i>Euphorbia esula</i> ,<br><i>E. cyparissias</i>                             | R |  |
| Plumeless Thistle<br>Canada Thistle<br>Musk Thistle | <i>Carduus acanthoides</i><br><i>Cirsium arvense</i><br><i>Carduus nutans</i> | R |  |
| Japanese Barberry                                   | <i>Berberis thunbergii</i>                                                    | R |  |
| Garden Yellow Loosestrife                           | <i>Lysimachia vulgaris</i>                                                    | R |  |
| Common Tansy                                        | <i>Tanacetum vulgare</i>                                                      | R |  |
| Black Locust                                        | <i>Robinia pseudoacacia</i>                                                   | R |  |
| Crown Vetch                                         | <i>Coronilla varia</i>                                                        | R |  |



3. **Watch:** Species not yet observed in the WHIP area but known in an adjacent county. Are a priority for early detection, and may be damaging either to ecology or to human health.

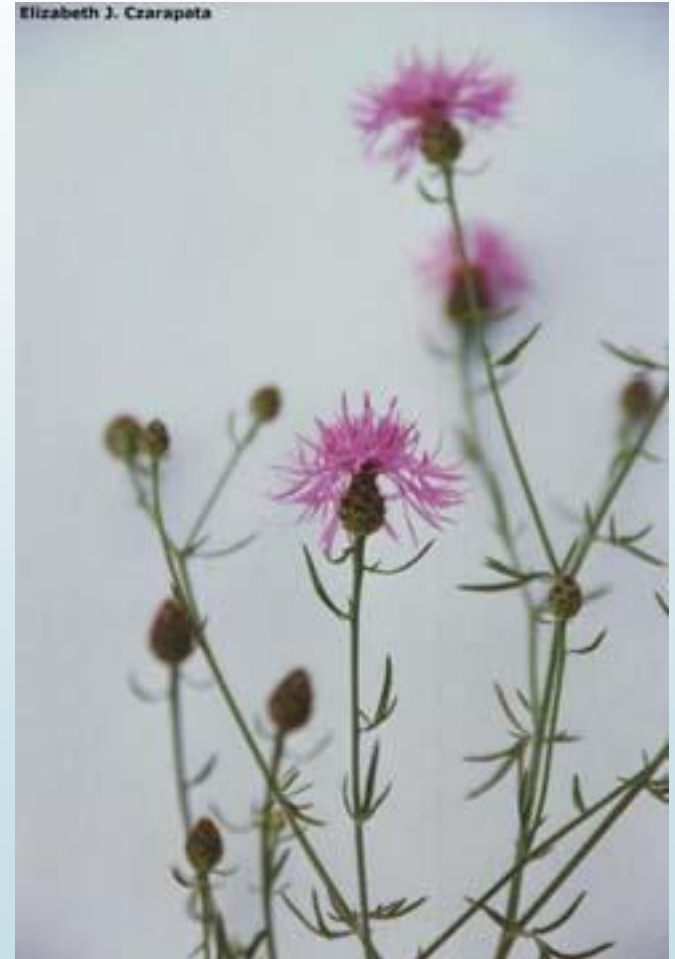
| Watch List         |                                |   |  |
|--------------------|--------------------------------|---|--|
| Giant Hogweed      | <i>Heracleum mantagazzanum</i> | P |  |
| Bohemian Knotweed  | <i>Polygonum x bohemicum</i>   | P |  |
| Giant Knotweed     | <i>Polygonum sachalinense</i>  |   |  |
| Policeman's Helmet | <i>Impatiens glandulifera</i>  | P |  |

.... And now for some photos...

# Spotted Knapweed

*(Centaurea maculosa)*

- Found on disturbed sites, fields, dunes, sunny areas
- Branching rough stems grow to 2' w/ pink-lavender flowers
- Produces by seed
- Releases toxins in the soil
- Can cause skin reactions with repeated exposure



# Spotted Knapweed





# Garlic Mustard

*(Alliaria petiolata)*

- Mid 1800s culinary introduction
- Spreads rapidly – can dominate forest floor in 5-7 yrs
- Very early spring growth
- Found in shade, sun, moist, roadsides
- Starts as a rosette then a 2<sup>nd</sup> year stalk and white flower
- Smells of garlic when crushed
- Is a superior competitor- can reduce biodiversity by suppressing growth of the ground-level flora and tree regeneration



Second year plants



# Garlic Mustard





# New Garlic Mustard brochure for Northwoods landowners

- In spring 2016 WHIP developed its first species-specific landowner brochure for dealing with Garlic Mustard with information on identification, control, and how to get assistance

### WHIP can help.

In recent years, the Wisconsin Headwaters Invasives Partnership has helped landowners in the Northwoods to identify and deal with Garlic Mustard. We have partnered with the WDNR and others to secure funds for appropriate herbicide treatments, and have also held successful Garlic Mustard Pull field days, with high school students from Conserve School and Phelps School. Working together, we can stop this invasive plant from taking over our valued Northwoods woodlands.

- ◊ If you plan to handpull Garlic Mustard, WHIP can provide bags and labels, and lend diggers, uprooters, and gloves.
- ◊ If you require handpulling assistance, we may be able to help recruit volunteers.
- ◊ If you are interested in herbicide application, for a large population, we can offer info and ideas for cost-sharing.

### RESOURCES:

- ➔ [www.dnr.wi.gov/topic/invasives/fact/garlicmustard.html](http://www.dnr.wi.gov/topic/invasives/fact/garlicmustard.html)
- ➔ [www.learningstore.uwex.edu/Assets/pdf/A392-4-07.pdf](http://www.learningstore.uwex.edu/Assets/pdf/A392-4-07.pdf)
- ➔ [www.hort.uwex.edu/articles/invasive-plants-of-wisconsin-garlic-mustard/](http://www.hort.uwex.edu/articles/invasive-plants-of-wisconsin-garlic-mustard/)
- ➔ [www.dnr.wi.gov/files/pdf/pubs/fi/fi0350.pdf](http://www.dnr.wi.gov/files/pdf/pubs/fi/fi0350.pdf)

WHIP member Rod Sharka discusses control options with a landowner in Phelps, WI.

Formed in 2009, the Wisconsin Headwaters Invasives Partnership (WHIP) is a multi-partner organization dedicated to the conservation of native species and habitats in Oneida and Vilas Counties of north-central Wisconsin. WHIP recognizes the threat of invasive species and works with partners to pool resources to provide education, monitoring and invasive species control.

For more information or to volunteer with WHIP's Garlic Mustard control efforts, please contact our Coordinator at 715-282-7269, or see [www.whipinvasives.org](http://www.whipinvasives.org).

Thank you!

This brochure was supported by a 2014-2016 grant from the Wisconsin Department of Natural Resources.

WHIP is fiscally sponsored by the Lumberjack Resource Conservation & Development Council, Inc.  
315 S. Oneida Ave  
Rhineland WI 54501  
ph. 715-369-9886  
[www.lumberjackrcd.org](http://www.lumberjackrcd.org)

## WHIP Wisconsin Headwaters Invasives Partnership

### Information for Northwoods Landowners

### Garlic Mustard: identification and control

Photo: Wisconsin DNR

### What is Garlic Mustard?

AKA: mustard root, garlic wort, garlic root, *Alliaria petiolata*  
Status: Restricted in Wisconsin, under Wis. Adm. Code chapter NR 40

Garlic Mustard is a small non-native plant that can easily invade edges of forests and woodlands, as well as any disturbed areas such as yards and roadsides. It can grow in sun and shade. It was originally brought to Wisconsin with European settlers for culinary usage since it successfully flourishes in our short northern growing season. This plant is now becoming more common, spreading on both private and public property in several parts of Oneida and Vilas Counties.

### How is it a threat to my property?

- Garlic Mustard can dominate a forest floor within just a few seasons, and out-competes our northern native wildflowers, ferns, and tree seedlings.
- Garlic mustard emits harmful chemicals into the soil, which suppress native plant growth.
- Decreased native biodiversity has lasting effects on wildlife and their food supply.
- High levels of invasive species can negatively affect recreation, agriculture, forestry, and lower property values.

A woodland taken over by Garlic Mustard.  
Photo: E. Casarapa

### How can I identify Garlic Mustard?

- Garlic Mustard is one of the first ground cover plants you will notice in early spring.
- Look for rosettes of kidney-shaped leaves with scalloped edges, and stalks up to 2 ft. with tiny white flowers of 4 petals (2nd year plants).
- The taproot is slender and white, with a U-shaped bend, easily pulled.
- Small black seeds form in elongated capsules.

Photo: R. Routledge

A key characteristic of this plant is that crushed leaves will have a strong garlic or onion odor!

Photo: L.J. Mehrtz

Photo: K. Kearns

Rosette of 1st year plant. Photo: S. Katovich, USDA Forest Service, bugwood.org.

### How can I control Garlic Mustard?

Garlic Mustard responds well to springtime hand-pulling as an easy and effective way to control small populations. Plants should be securely bagged, labeled "invasive species- approved for landfill" and disposed of with trash.

Careful herbicide treatments can be applied in early spring or fall, when other plants are dormant but Garlic Mustard is still green and vulnerable. Check the University of Wisconsin-Extension and the DNR websites for updated herbicide recommendations or see: <http://bit.ly/21asxj3>. Seeds can remain viable in soil for several years, but consistent control efforts will keep thousands of seeds from germinating on your property, and will eventually lead to a much healthier forest.

Garlic Mustard Pull with Conserve School Students, 2015. Photo: A. Page

Bags are labeled for disposal.

- Seeds spread easily on boots, clothing, vehicles, and mowers. Check your cuffs!
- Share your experiences with neighbors to grow the effort against Garlic Mustard!





*Conserve School's excellent student volunteers!*



*Landowner Jeff Lewison with Garlic Mustard-free daffodil bed*



*WHIP's Weed Whipper Rod Sharka*





# Japanese Knotweed

*(Polygonum cuspidatum)*

- ◉ Originally an ornamental, extremely hardy perennial shrub
- ◉ Can tolerate shade, upland and wetland both, and a variety of soils
- ◉ May reach 12 feet and more
- ◉ Flowers plumelike, creamy white, summer bloom
- ◉ Stems – bamboolike, hollow, reddish brown
- ◉ Reproduces mainly by massive root rhizomes creating new shoots
- ◉ Can emerge through concrete and jeopardize building foundations!



Nissa Karimi

Restricted





Kelly Kearns



2005 Louis-M. Landry



2005 Louis-M. Landry



2004 Ben Legler

Japanese Knotweed can hybridize with Giant Knotweed to form a new persistent hybrid, considered prohibited by the state. Leaves are heart-shaped, not squared at base.



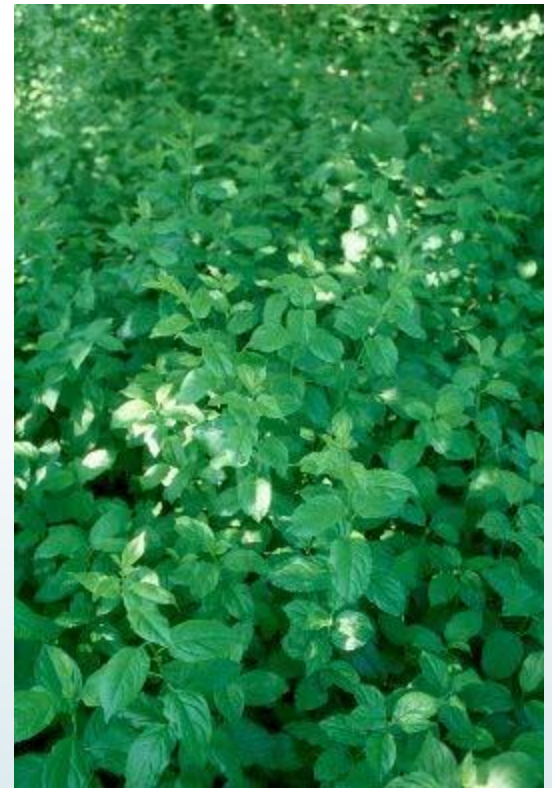
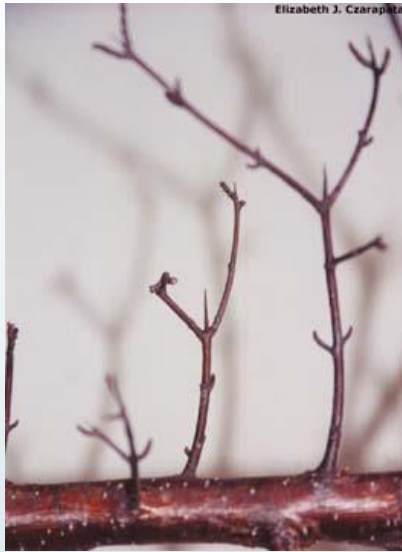
# Common and Glossy Buckthorn, *Rhamnus cathartica* and *R. frangula*

- Both species were promoted for ornamental uses but exhibit strong competitor behavior: they leaf out earlier than their native competitors, resprout vigorously, and produce large amounts of seeds that are spread by birds
- Buckthorn can suppress tree seedling survival and can stunt height by **shading** and through their extensive root systems
- Aggressive tree/tall shrub, 10-25' tall
- Grows in wide variety of habitats- is all over Rhineland!



(C) 2002, Gary Fewless

# Common and Glossy Buckthorn





# Honeysuckles (*Lonicera* spp.)

Amur (*maackii*), Bell's (*bella*), Japanese (*japonica*), Tartarian (*tatarica*)

- Upright shrubs 6-18'
- Likes open sunny areas and forms thickets hampering forest access for surveying and work
- Flowers abundant, pink, red, white
- Fruit abundant, paired together
- Natives are woody more vine like or short, sparse shrubs.
- Invasive honeysuckle stems usually HOLLOW



©2004, Gary Fewless

# Honeysuckles



Tartarian  
Honeysuckle



Morrow's Honeysuckle



Amur Honeysuckle



Japanese Honeysuckle



Bells Honeysuckle

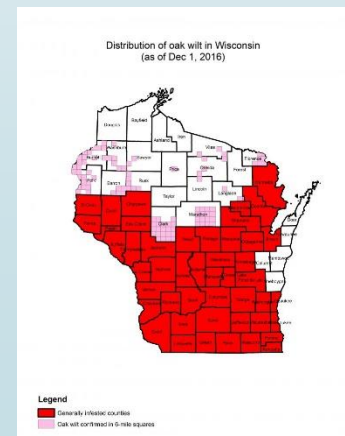
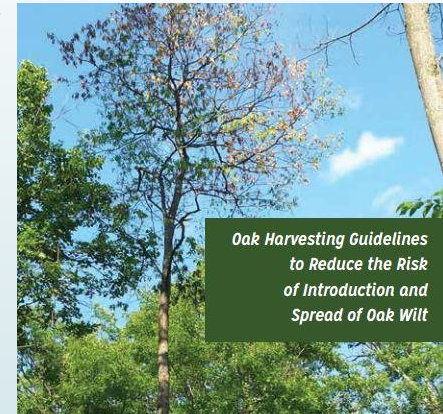


# Species on the Horizon...



# Oak Wilt

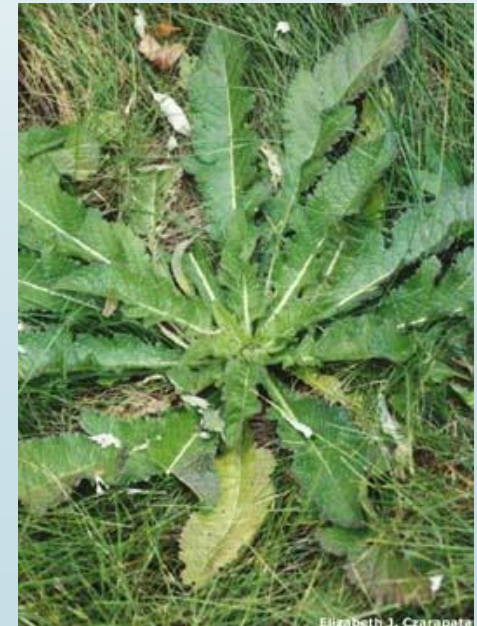
- Oak wilt is a deadly fungal disease affecting red oaks primarily
- Common in southern WI, and creeping northward. The disease was found for the first time in 2010 in Oneida County, in 2012 in Lincoln, Sawyer, and Vilas counties, in 2013 in Rusk County, and in 2014 in Washburn County. Oak wilt has been confirmed in all Wisconsin counties except Ashland, Bayfield, Calumet, Door, Douglas, Forest, Iron, Kewaunee, Manitowoc, Sheboygan, and Taylor.
- Spring and early summer pruning makes oak trees vulnerable to oak wilt. Any tree damage during this time creates an opening that exposes live tree tissue and provides an opportunity for the oak wilt fungus to infect the tree.
- Avoid pruning oaks from April through July.
- Follow Oak Harvesting Guidelines at <http://dnr.wi.gov/topic/ForestHealth/documents/OakWiltBooklet.pdf>





# Teasels, *Dipsacus fullonum* and *D. laciniatus*

- Three known sites in the WRISC area, two sites in Door County, one in Langlade. Common in southern WI
- Invades open areas, prairies, savannas, and sedge meadows, as well as roadsides and disturbed areas.
- This thistle-like plant grows as a basal rosette for at least one year, then forms a prickly flowering stalk, 2-6' tall, deep taproot
- Purple or white flowers, still used in horticulture and flower arrangements



# Wild Parsnip, *Pastinaca sativa*



Grows as a rosette in 1<sup>st</sup> year, develops carrot-like taproot. When conditions are right, it grows a hollow stalk 2-5 ft, with yellow flowers and flat, oval seeds.

- Leaves: compound, with 5 to 15 leaflets.
- Flowers: Yellow, in flat-topped umbrella-like clusters like Queen Anne's Lace
- Become green early in spring, and flowers yellow in midsummer.
- Habitat: Roadsides, abandoned fields, pastures, edges of woods, prairie restorations.
- Can cause burns and blisters on human skin





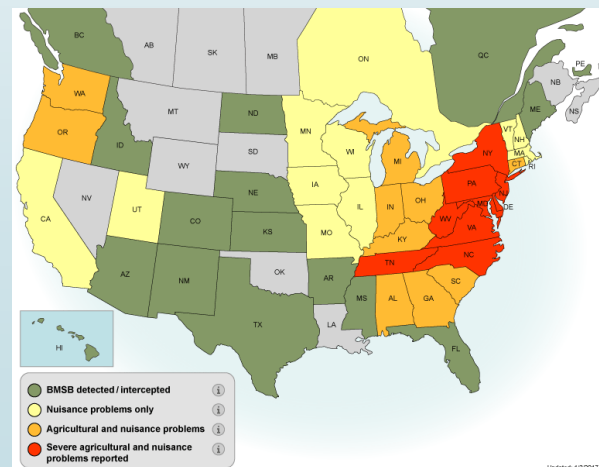
# Giant Hogweed, *Heracleum mantagazzanum*

- Invades roadsides, empty lots and woodland edges, can crowd out native vegetation; noxious weed.
- Prefers moist areas with shade, particularly along stream banks, where it can lead to soil erosion and can disperse seeds downstream.
- Leaves are covered in coarse white hairs, stalk also has purple mottling.
- Flowers: Large umbels, up to 20" wide across its flat top, with many white, 5-petal flowers that bloom from May-July
- Can cause burns and blisters on humans
- OFTEN confused with Cow Parsnip and Great Angelica, which are much smaller, smooth non-mottled stalks

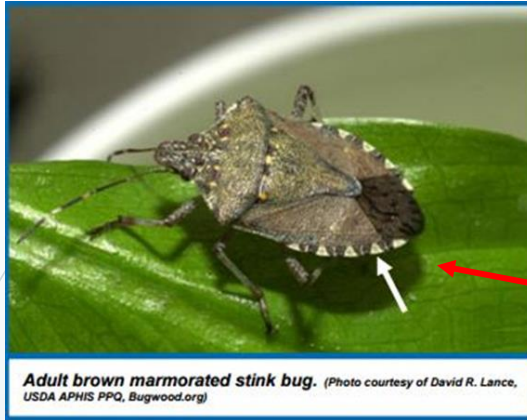


# Brown Marmorated Stink Bug (BMSB)

- Native of eastern Asia, establishing in the U.S. since 2001 as an agriculture, garden and home pest.
- Hitches a ride on car windshields- adults mostly spread!
- **NEW in 2016: discovery of juveniles and mating adults as confirmation of reproducing in Wisconsin. Also first reports of BMSB feeding on plants, not just overwintering in structures.**
- BMSB feeds on plants including commercially important fruit and vegetable crops, including apple, Asian pear, cherry, cranberry, currant, grape, peach, pear, raspberry, asparagus, dry bean, green bean, pepper, sweet corn, tomato, field corn and soybean.

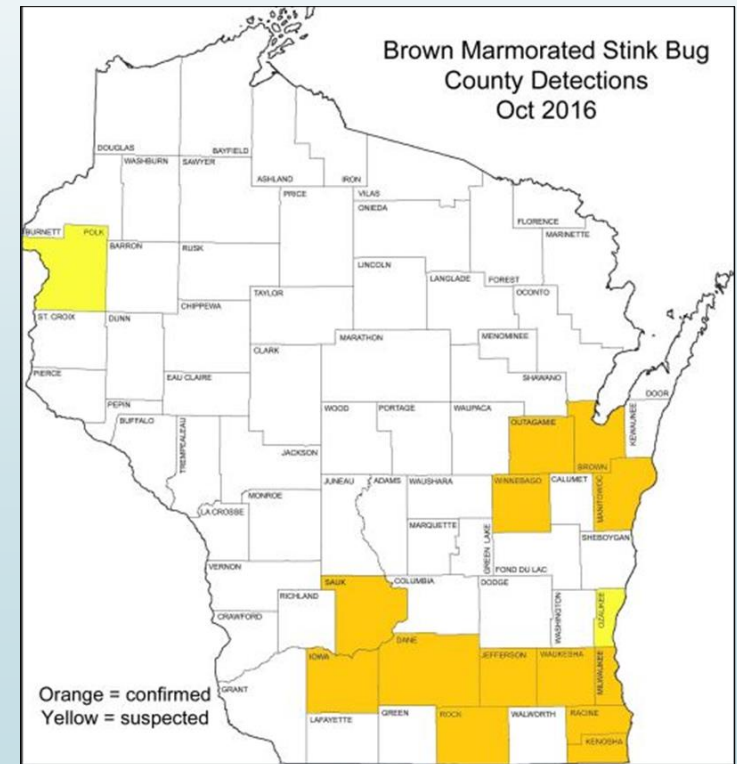






- ▶ ½ to 5/8 inch long, typical “shield”-shaped bodies of other stink bugs, mottled brown to gray.
- ▶ Look for alternating light and dark brown spots on the abdomen where it protrudes beyond the edge of the wings

This map showing where BMSB has been confirmed or is suspected as of October 2016 was created by P.J. Liesch, University of Wisconsin-Madison Insect Diagnostic Lab and Bill McNee, Wisconsin DNR.



# Emerald Ash Borer Updates



- 98 new Wisconsin municipalities and townships were added in 2016, pushing the total to more than 300 since 2007
- The larva (the immature stage of EAB) spends its life inside ash trees, feeding on the inner bark. This feeding disrupts the trees' ability to move water and nutrients back and forth from the roots to the rest of the tree. The tree starves and eventually dies.
- A tree that has been attacked by EAB can die within 2-4 years. It is estimated that more than 50 million ash trees are dead or dying in the Midwest because of this insect.
- **1-800-462-2803 to reach both DNR and DATCP**
- **<http://datcpservices.wisconsin.gov/eab>**



- 

AND QUARANTINE

The map shows the following county distribution:

- Yellow (Moderate Impact):** Douglas, Sawyer, Oneida, Lincoln, Marathon, Clark, Wood, Portage, Waupaca, Outagamie, Brown, Kewaunee, Manitowish, Fond Du Lac, Dodge, Grant, Lafayette, Green, Rock, Walworth, Racine, Kenosha.
- Green (Severe Impact):** Buffalo, Remondieu, Jackson, La Crosse, Monroe, Juneau, Adams, Marquette, Green, Fox, Shawano, Door, Winnebago, Calumet, Manitowish, Fond Du Lac, Dodge, Grant, Lafayette, Green, Rock, Walworth, Racine, Kenosha.
- White (Minimal/No Impact):** Burnett, Washburn, Bayfield, Ashland, Iron, Vilas, Florence, Forest, Marmette, Langlade, Menominee, Oconto, Shawano, Pepin, Eau Claire, Taylor, Lincoln, Marathon, Clark, Waushara, Winnebago, Calumet, Manitowish, Fond Du Lac, Dodge, Grant, Lafayette, Green, Rock, Walworth, Racine, Kenosha.

Most of Wisconsin is EAB-free, including most of the northern half and the yellow areas in all quarantined counties. EAB has been confirmed only in those cities, villages and townships colored dark green. By following quarantine rules and limiting the transport of ash wood and all firewood, we can slow down EAB's spread to the northern forests and un-infested communities in the south. Visit [www.emeraldashborer.wi.gov](http://www.emeraldashborer.wi.gov) for information on what you can do.

 Non-Quarantined County, No EAB Detections

 Quarantined County

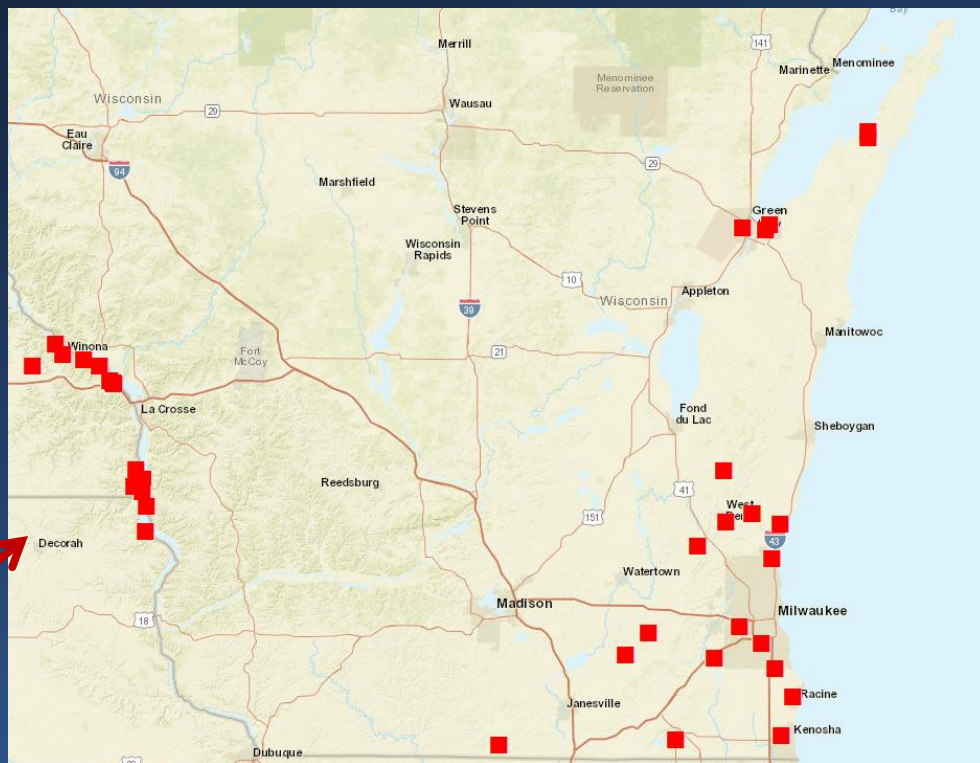
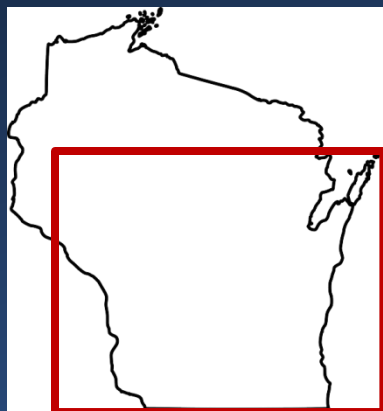
 EAB Confirmed Area in a Quarantined County

- 
-  Non-Quarantined County,  
No EAB Detections  
 Quarantined County  
 EAB Confirmed Area in a  
Quarantined County

Map last updated 4/7/2017

# EAB Parasitic Wasp Releases

- A TOOL to help reduce EAB populations and slow ash mortality
- Will not save Ash but will slow the spread
- *Tetrastichus* is spreading about 6 miles per year
- *Oobius* is not spreading very quickly
- New *Spathius* species released in 2016





# Hemlock Woolly Adelgid

- Has NOT been found in WI yet
- Brought to the eastern US on Japanese nursery stock; found in Virginia in 1951
- Hemlocks usually die within 10 years, and faster on weakened trees
- Tiny crawlers are easily spread by wind, birds, animals and human transport on nursery stock
- Please report any white wool at the base of hemlock needles



Adelgid 'wool' on hemlock



Adelgid nymphs

# Hemlock Woolly Adelgid in Western Michigan

- HWA has escaped into the natural forest and been there for 10+ years, long enough to cause tree mortality
- Likely introduced on infested landscaping trees
- Detections along a 50-60 mile band. 14 'active' infestations and keep finding more HWA.
- Trees can be protected with insecticides – some provide 5+ years of protection

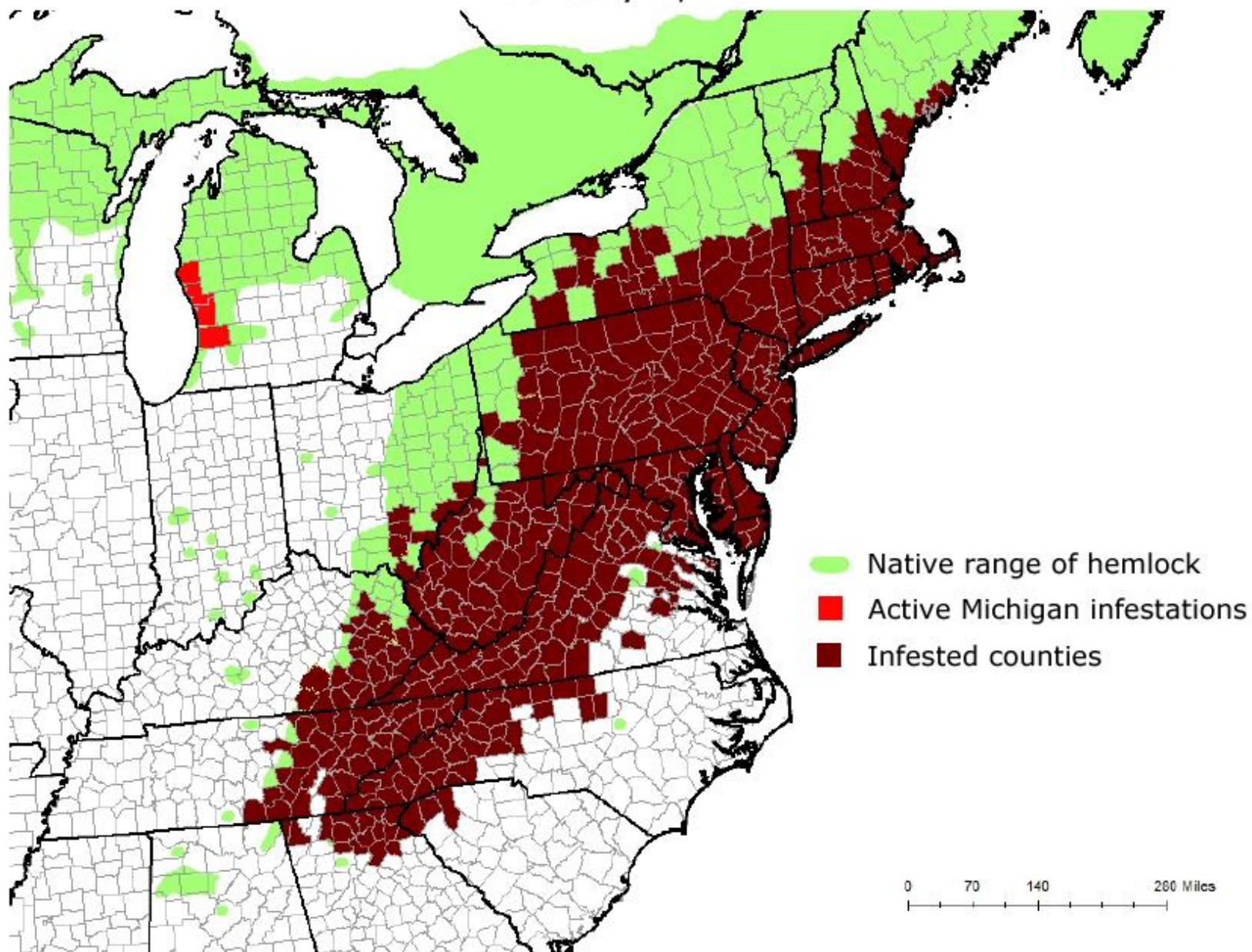


Hemlock mortality in Great Smoky Mountains National Park



# Hemlock Woolly Adelgid Distribution

February 8, 2017



# Hemlock Woolly Adelgid

- Can be parthenogenic - one individual could create a whole infestation
- Taxidermied birds noted with scales
- Peak transfer rates of crawlers coincide with the spring songbird migratory period
- DNR bird experts say that many songbirds do migrate across Lake Michigan



HWA adult with wool removed





# Jumping Worms, *Amyntas* spp.

- In October of 2013, new type of invasive worm was discovered at the UW Arboretum, previously "crazy worms" or "Alabama jumpers."
- They change the soil, by eating voraciously and processing leaf litter on the forest floor. Their grainy, dry worm castings (poop) cannot support understory plants.
- In residential and urban areas they can also harm ornamental plantings and turf.
- As a "Restricted Species", the law prohibits the sale, introduction, transport and propagation of jumping worms in the state.
- They reach maturity at 60 days, allowing for 2 hatches per season



### Why are they harmful?

Jumping worms change the soil in a negative way more than any other earthworm we have in Wisconsin.



Soil becomes granular and looks like dried coffee grounds.

- They produce a unique, grainy soil "signature" which may keep plants from growing.
- Jumping worms produce young (cocoon) without a mother so just one worm can start a population.
- Jumping worm cocoons can survive winter and hatch in spring!

### Get involved!

Help us track down jumping worms in Wisconsin.

For more information visit [dnr.wi.gov](http://dnr.wi.gov), keyword "jumping worm"

Email reports to [invasive.species@wi.gov](mailto:invasive.species@wi.gov)



Join Wisconsin's First Detectors Network. Be a citizen scientist. Visit [fyi.uwex.edu/wildn](http://fyi.uwex.edu/wildn) to join!

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### UNWANTED! Jumping Worms

*Amyntas* spp.



Be on the lookout for this new invader.

### Protect your yard and forests!

### How will I recognize them?



*Amyntas* spp. is glossy white to gray and smooth to the body of the worm not raised.

**Their appearance.**

- Smooth glossy gray color. The clitellum (lighter colored band) is cloudy-white to gray and completely circles their body.

**Their behavior!**

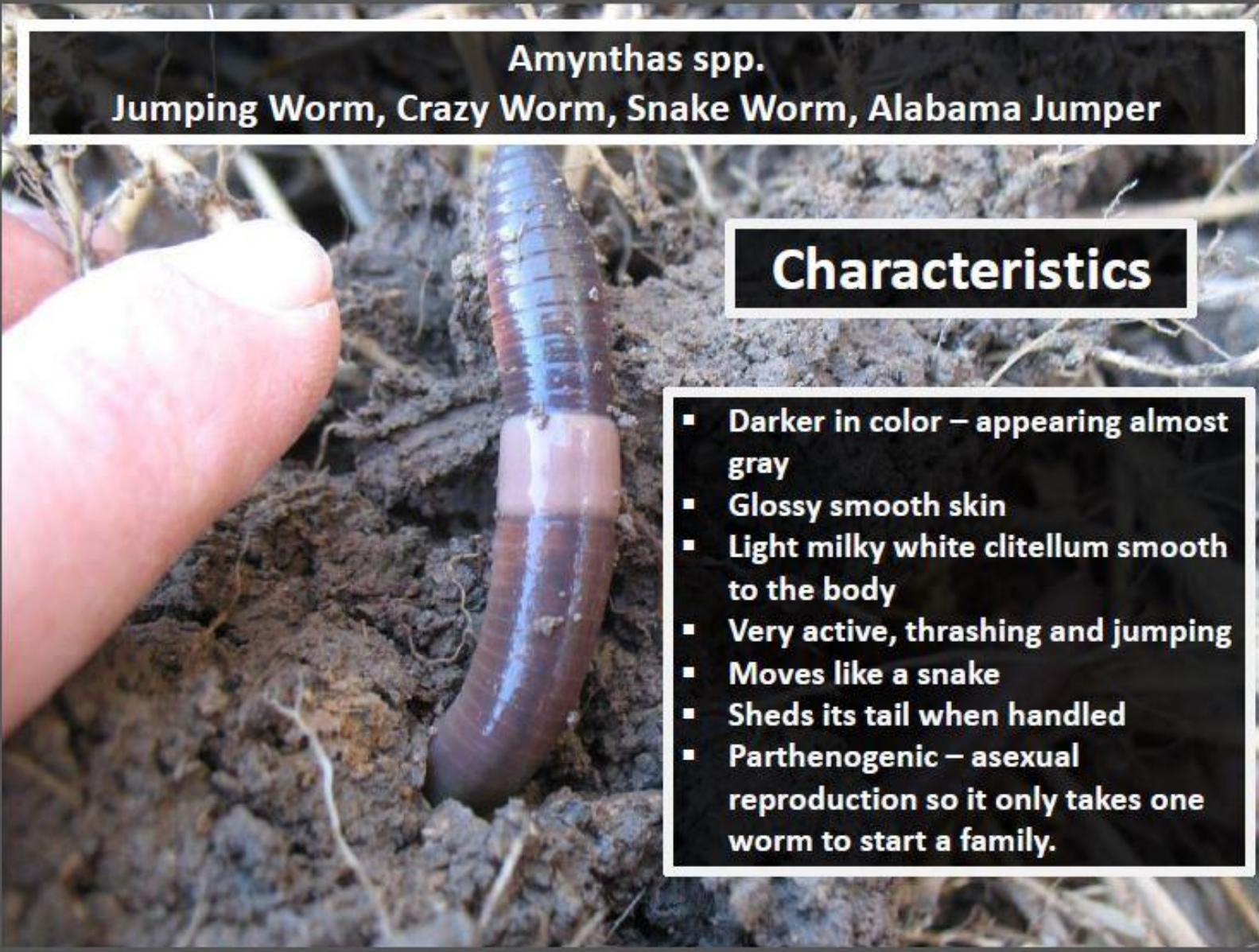
- They thrash wildly and can shed their tails in defense.

**What you won't see:**

- You won't have just one!
- You won't see jumping worm adults until late June. They die in winter, while their young survive in cocoons.
- The cocoons are tiny. We can't see them with just our eyes. (Cocoons hold the unwatched, baby worms.)

**Where they spend their time.**

- Jumping worms are easy to find. They stay on the soil surface.



**Amyntas spp.**

**Jumping Worm, Crazy Worm, Snake Worm, Alabama Jumper**

## **Characteristics**

- Darker in color – appearing almost gray
- Glossy smooth skin
- Light milky white clitellum smooth to the body
- Very active, thrashing and jumping
- Moves like a snake
- Sheds its tail when handled
- Parthenogenic – asexual reproduction so it only takes one worm to start a family.



- In residential and urban areas they can also harm ornamental plantings and turf.
- Jumping Worms can be found in shared potted plants and hiding in mulch
- These worms also do not make good bait because their bodies are ridged and tend to fall apart on hooks.
- Cold does not seem to affect them nor the cocoons/eggs



# Best Management Practices – Jumping Worms

- Input was taken from nursery growers, composters, master gardeners, and cities, to form ways to **minimize the spread of Jumping Worms:**
- **Arrive clean, leave clean. Clean soil and debris from vehicles, equipment, gardening tools and gear before moving from a work or recreational area.**
- **Watch for jumping worms and signs of their presence. If you find them, report them to the DNR by email at [invasive.species@wi.gov](mailto:invasive.species@wi.gov).**
- **Educate yourself and others to recognize jumping worms.**
- **Only use, sell, plant, purchase or trade landscape and gardening materials and plants that appear to be free of jumping worms.**
- **Only sell, purchase or trade compost that was heated to appropriate temperatures and duration following protocols for reduction in pathogens (see Wis. Admin. Code Ch. NR 502.12).**



# CAN WE KILL THEM?

**We're working on that...**

Research indicates that tea seed meal, a natural by-product of tea oil manufacture, and containing natural surfactants called saponins, is effective for expelling earthworms. The mode of action is similar to that of mowrah meal, a mainstay for managing earthworms on golf courses a century ago. Tea seed meal has been formulated into an organic fertilizer (Early Bird™ 3-0-1) suitable for use on fairways and putting greens.



Commonly mistaken for jumping worms.



- Body is pink or flesh-toned with a well-defined raised clitellum further down on the body.
- Generally larger, slower, and produce slime when handled.
- Nightcrawlers live deep below the soil surface.



Jumping worm  
Smooth clitellum, closer to head

More information at:  
dnr.wi.gov, keyword "jumping worm"  
To report a sighting, email:  
Invasive.Species@Wisconsin.gov  
DNR PUB FR-550a 2015

## JUMPING WORM FIELD GUIDE



Jumping worms (*Amyntas* spp.) dwell on the soil surface and eat leaf litter. They can turn up almost anywhere from urban parks, to suburban backyards, to rural forests. Because they reproduce on their own, a single worm can start a new population. You can help prevent jumping worms from spreading to new areas by knowing what to look for.

Please take cards and brochures, and help spread the word!

They

### harmful!

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Wisconsin Department of Natural Resources  
PO Box 7921, Madison, WI 53707-7921  
PUB-FR-550 2015

Designed by Michelle Vosa, DNR Science Services  
Front and back cover photos: DNR Files

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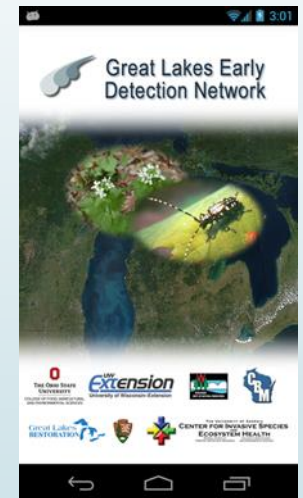
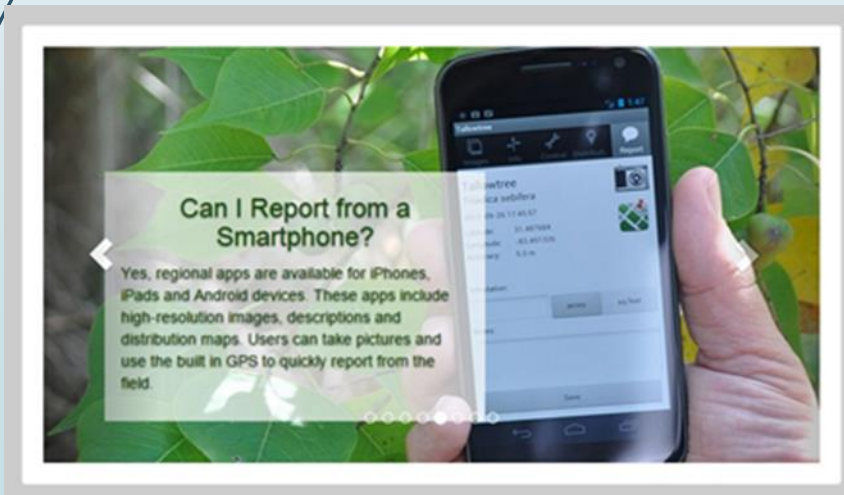
### Where they spend their time.

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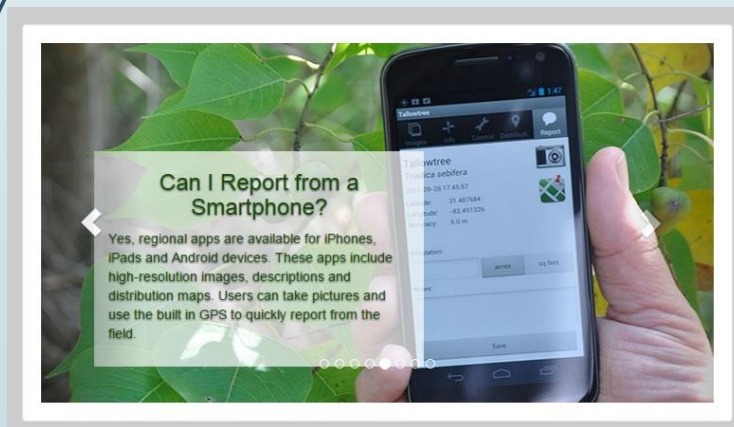
# Reporting Invasive Species: several options

- **It's best to check it out rather than leave it!**
- Report any suspicious species to your local CISMA, County Land&Water Dept., or to the DNR directly
- Send a note to [invasive.species@wi.gov](mailto:invasive.species@wi.gov)
- Report using the free app for the Great Lakes Early Detection Network (GLEDN)



# GLEDN is linked to EDDMapS: Early Detection & Distribution Mapping System

- ▶ This app was originally a tool for state Exotic Pest Councils to develop better distribution data of invasive species.
- ▶ EDDMapS' goal is to make data widely accessible and currently holds more than 2.6 million records
- ▶ Your report will upload a species and location, to get confirmed, and then added to species lists for the Great Lakes Early Detection Network (GLEDN)

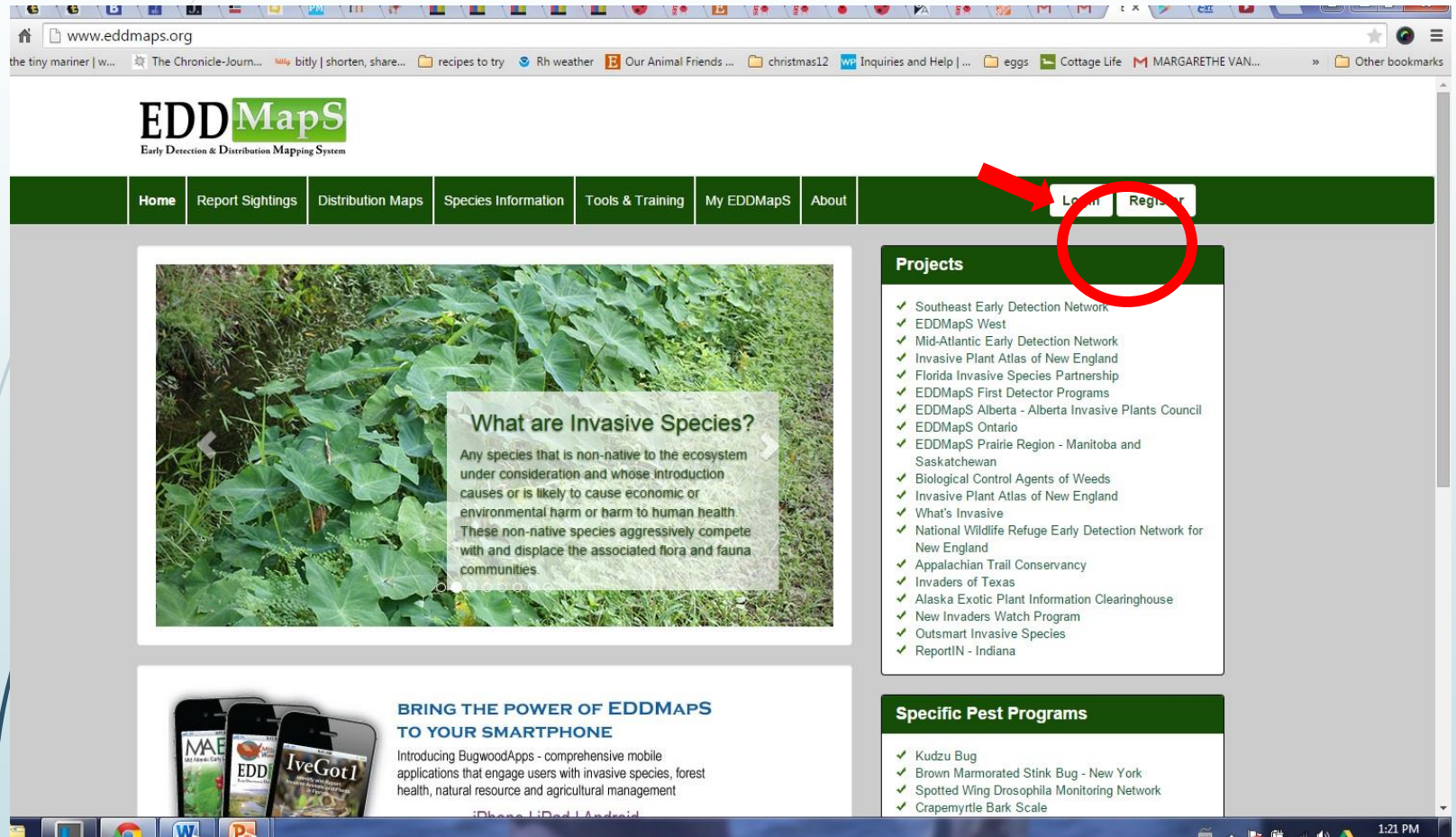


*EDDMaps has created more than 20 invasive species apps for different locations!*



# Steps to reporting an invasive species:

## 1. Join at EDDMaps.org



The screenshot shows the EDDMaps.org website. The browser address bar displays "www.eddmaps.org". The website header includes the EDDMapS logo and the tagline "Early Detection & Distribution Mapping System". A green navigation bar contains links: Home, Report Sightings, Distribution Maps, Species Information, Tools & Training, My EDDMapS, and About. To the right of these links are "Login" and "Register" buttons, with a red circle and arrow highlighting the "Register" button. The main content area features a large image of a green plant with a text box titled "What are Invasive Species?" explaining that they are non-native species that cause economic or environmental harm. Below this is a section titled "BRING THE POWER OF EDDMAPS TO YOUR SMARTPHONE" promoting mobile apps like "IveGot1". On the right side, there are two sections: "Projects" listing various early detection networks and programs, and "Specific Pest Programs" listing pests like Kudzu Bug and Brown Marmorated Stink Bug. The Windows taskbar at the bottom shows the time as 1:21 PM.

www.eddmaps.org

the tiny mariner | w... The Chronicle-Journ... bitly | shorten, share... recipes to try Rh weather Our Animal Friends ... christmas12 WP Inquiries and Help | ... eggs Cottage Life MARGARETHE VAN... Other bookmarks

**EDDMapS**  
Early Detection & Distribution Mapping System

Home Report Sightings Distribution Maps Species Information Tools & Training My EDDMapS About Login Register

**What are Invasive Species?**

Any species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. These non-native species aggressively compete with and displace the associated flora and fauna communities.

**BRING THE POWER OF EDDMAPS TO YOUR SMARTPHONE**

Introducing BugwoodApps - comprehensive mobile applications that engage users with invasive species, forest health, natural resource and agricultural management

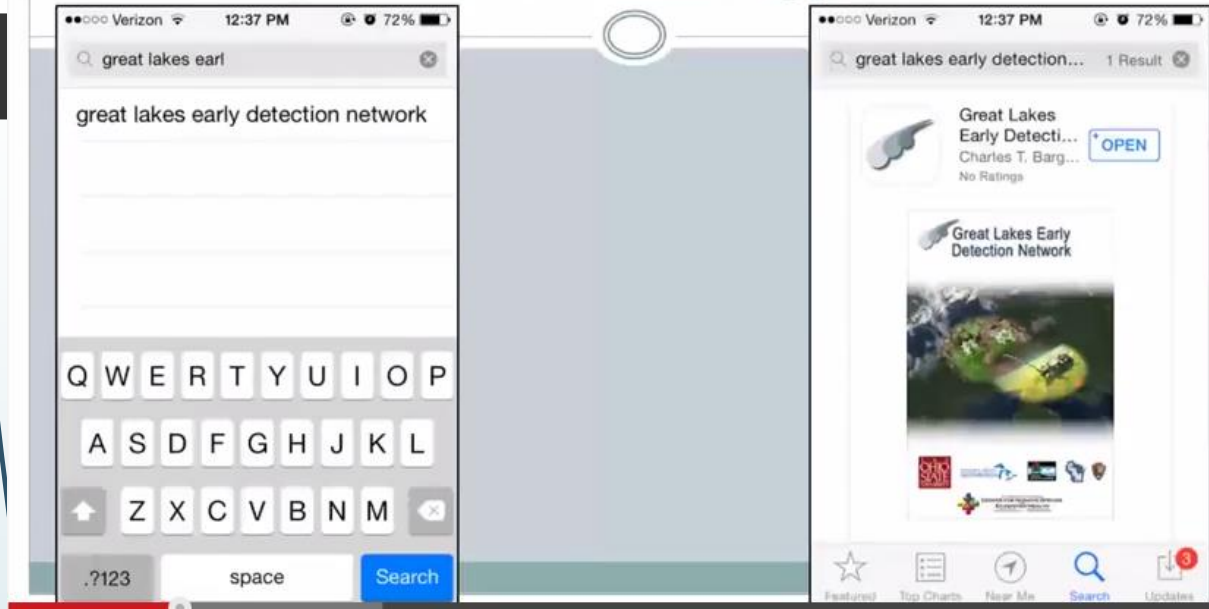
**Projects**

- ✓ Southeast Early Detection Network
- ✓ EDDMapS West
- ✓ Mid-Atlantic Early Detection Network
- ✓ Invasive Plant Atlas of New England
- ✓ Florida Invasive Species Partnership
- ✓ EDDMapS First Detector Programs
- ✓ EDDMapS Alberta - Alberta Invasive Plants Council
- ✓ EDDMapS Ontario
- ✓ EDDMapS Prairie Region - Manitoba and Saskatchewan
- ✓ Biological Control Agents of Weeds
- ✓ Invasive Plant Atlas of New England
- ✓ What's Invasive
- ✓ National Wildlife Refuge Early Detection Network for New England
- ✓ Appalachian Trail Conservancy
- ✓ Invaders of Texas
- ✓ Alaska Exotic Plant Information Clearinghouse
- ✓ New Invaders Watch Program
- ✓ Outsmart Invasive Species
- ✓ ReportIN - Indiana

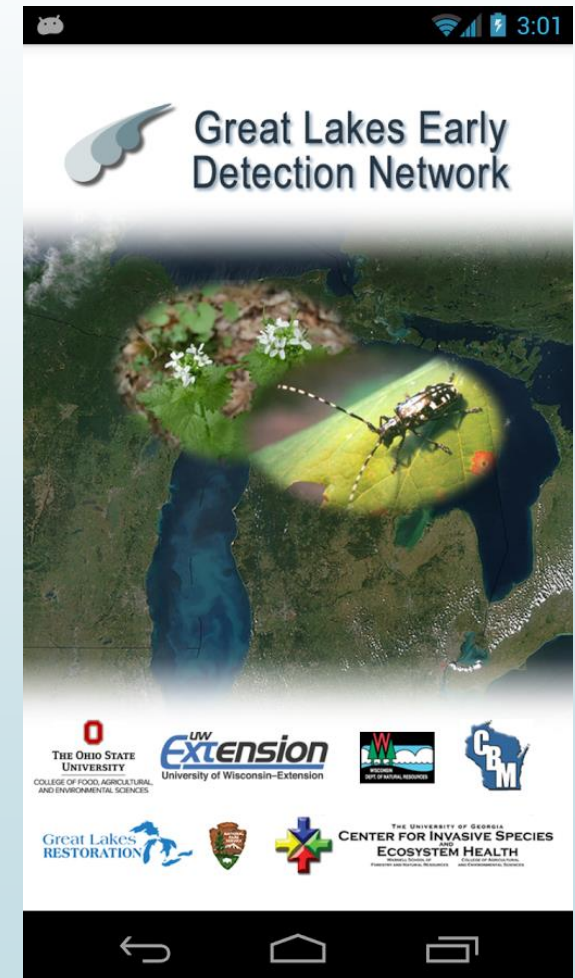
**Specific Pest Programs**

- ✓ Kudzu Bug
- ✓ Brown Marmorated Stink Bug - New York
- ✓ Spotted Wing Drosophila Monitoring Network
- ✓ Crapemyrtle Bark Scale

## #1 Download App



- To download the app, type in Great Lakes Early Detection Network, click “install”.
- It is free, comes loaded with photos and info

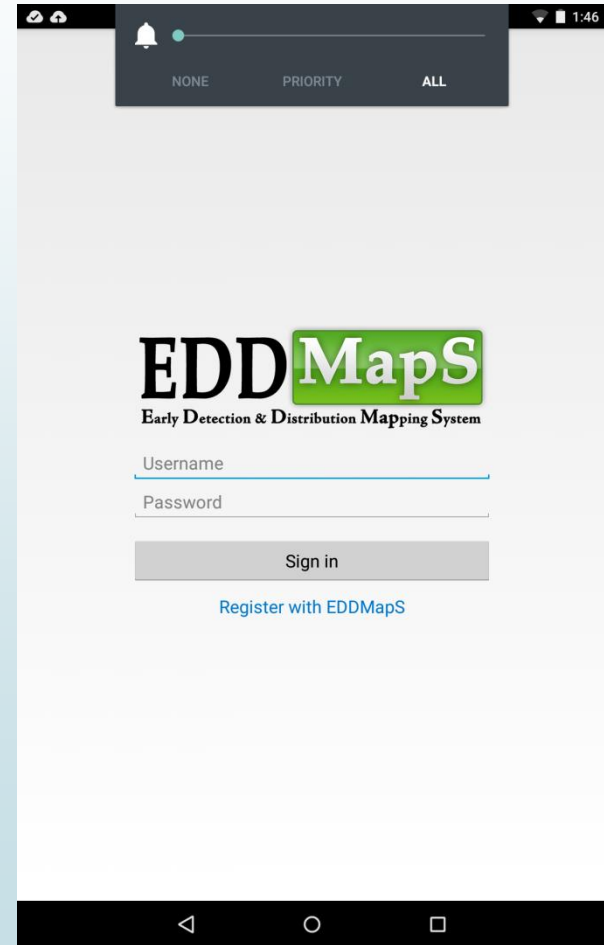
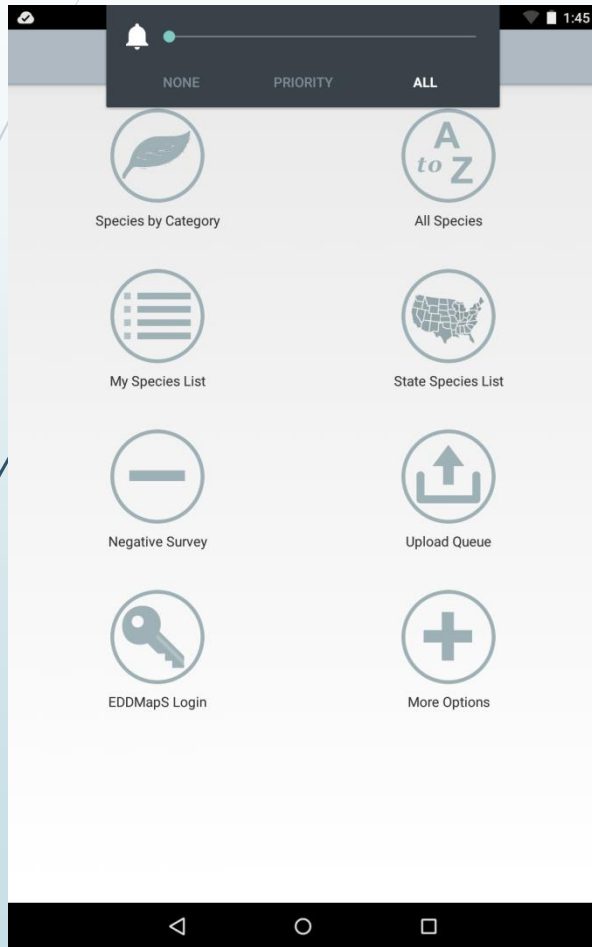


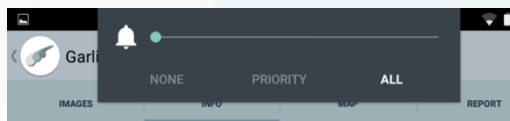
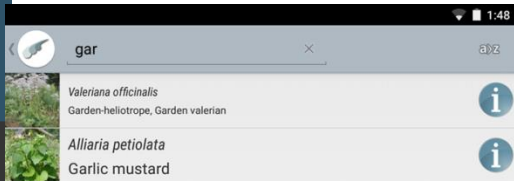


Sign in with same username you created at the EDDMaps website.  
On the WHIP tablets...

Username: whipinvasives@gmail.com

Password: knapweed1





## Garlic mustard

### *Alliaria petiolata*

#### Appearance

Garlic mustard is an herbaceous, biennial forb. First year plants are basal rosettes which bolt and flower in the second year. Plants can be easily recognized by a garlic odor that is present when any part of the plant is crushed.

#### Foliage

Foliage on first year rosettes is green, heart shaped, 1-6 in. (2.5-15.2 cm) long leaves. Foliage becomes more triangular and strongly toothed as the plant matures.

#### Flowers

Second year plants produce a 1-4 ft. (0.3-1.2 m) tall flowering stalk. Each flower has four small, white petals in the early spring.

#### Fruit

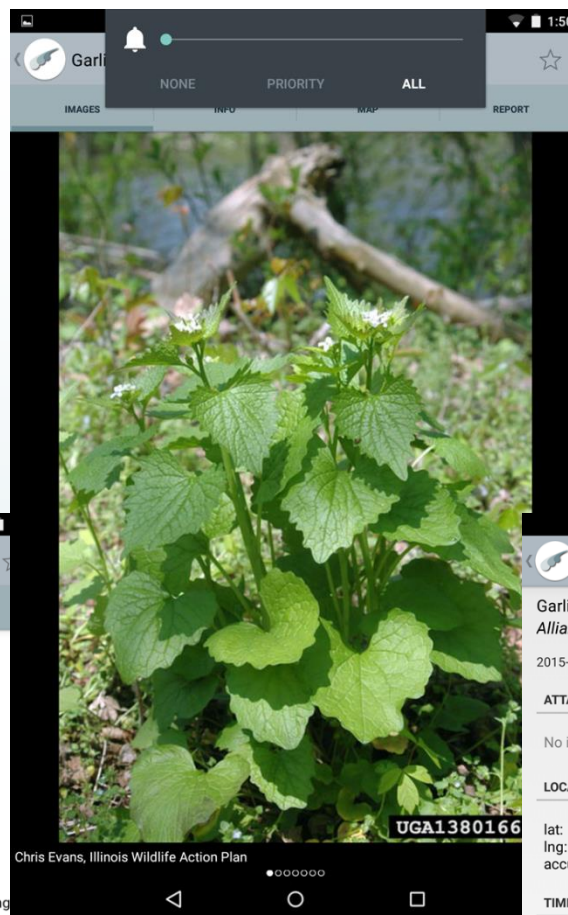
Mature seeds are shiny black and produced in erect, slender green pods which turn pale brown when mature.

#### Ecological Threat

Garlic mustard is an aggressive invader of wooded areas throughout the eastern and middle United States. A high shade tolerance allows this plant to invade high quality, mature woodlands, where it can form dense stands. These stands not only shade out native understory flora but also produce allelopathic compounds that inhibit seed germination of other species. Garlic mustard is native to Europe and was first introduced during the 1800s for medicinal and culinary purposes.

#### Taxonomy

Phylum: Magnoliophyta



Report

Garlic mustard  
*Alliaria petiolata*

2015-04-29 1:48 PM

ATTACH IMAGE

No images

LOCATION

lat: 45.600087  
lng: -89.510443  
accuracy: 17.6 m

TIME SPENT IN MINUTES

5 10 15 30 45 60

INFESTATION

Acres Sq Feet

DENSITY

Low Medium High

NOTES

SAVE



# BUY IT WHERE YOU BURN IT.

Don't Move Firewood



## Help Prevent The Spread Of Invasive Forest Pests

- Arrive with clean gear.
- Burn local or certified firewood.
- Use local or weed-free hay.
- Stay on the trails.
- Before leaving, remove mud and seeds.



**STOP INVASIVE SPECIES  
IN YOUR TRACKS.**

[PlayCleanGo.org](http://PlayCleanGo.org)

**DON'T MOVE  
FIREWOOD.org**

# BLOW THE WHISTLE ON CANADA THISTLE.

Give Invasive Species The Brush Off.



## Help Prevent The Spread Of Invasive Plants And Animals.

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STOP INVASIVE SPECIES  
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PlayCleanGo.org

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STOP INVASIVE SPECIES  
IN YOUR TRACKS.

PlayCleanGo.org

THE STATE OF MINNESOTA



# GIVE INVASIVE SPECIES THE BRUSH OFF.

Clean Your Gear Before Entering  
And Before Leaving The Recreation Site.



## Help Prevent The Spread Of Invasive Plants And Animals.

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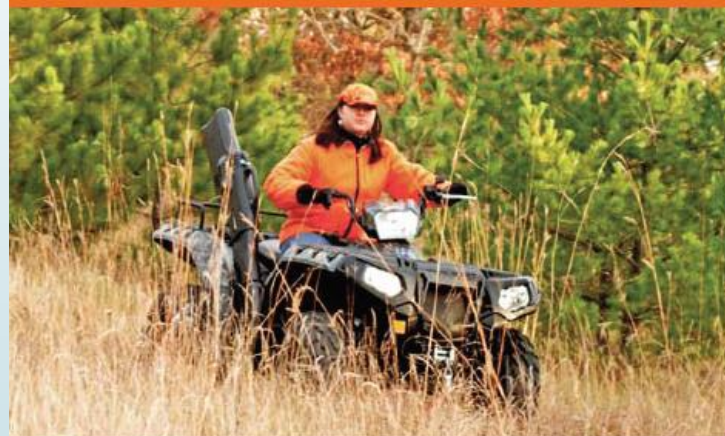


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# RIDE. CLEAN. GO.

Stop Invasive Species In Your Tracks.



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THE STATE OF MINNESOTA



**Invasive forest pests are being introduced into the United States at astonishing rates (Haack 2006). Once established, these pests could have tremendous adverse impacts on our commercial and urban forest resources. The basic tenet of sustainable forest management is “meeting the forest resource needs and values of the present without compromising the similar capability of future generations”... Non-native invasive species threaten not only today’s environment, but also the environment of the future.**

*Impacts of Nonnative Invasive Species on US Forests and Recommendations for Policy and Management (Moser et al, Journal of Forestry 2009)*



# Thank You!

- WHIP is always open to suggestions and feedback
- Share our information with friends and family
- Help us spread the word about invasive species by booking WHIP for a talk or presentation!

[www.whipinvasives.org](http://www.whipinvasives.org)

Rosie Page

WHIP Coordinator

[rpge19@gmail.com](mailto:rpge19@gmail.com)

715-282-7269

