



Extension

UNIVERSITY OF WISCONSIN-MADISON



# Invasive Plants

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Anne Pearce + Mark Renz



# Invasive Plants

- 1) Non-native, naturalized
- 2) Growing or spreading rapidly
- 3) Cause or have potential to cause harm



Rob Routledge, Sault College, Bugwood.org

*Invasive Dame's rocket*



# 1) Non-native, Naturalized

- Non-native → not present in WI prior to European settlement
- Naturalized → persists on its own
- Example: black locust native to southeast US, but introduced to WI + persists on its own



Native plants can be problematic too!

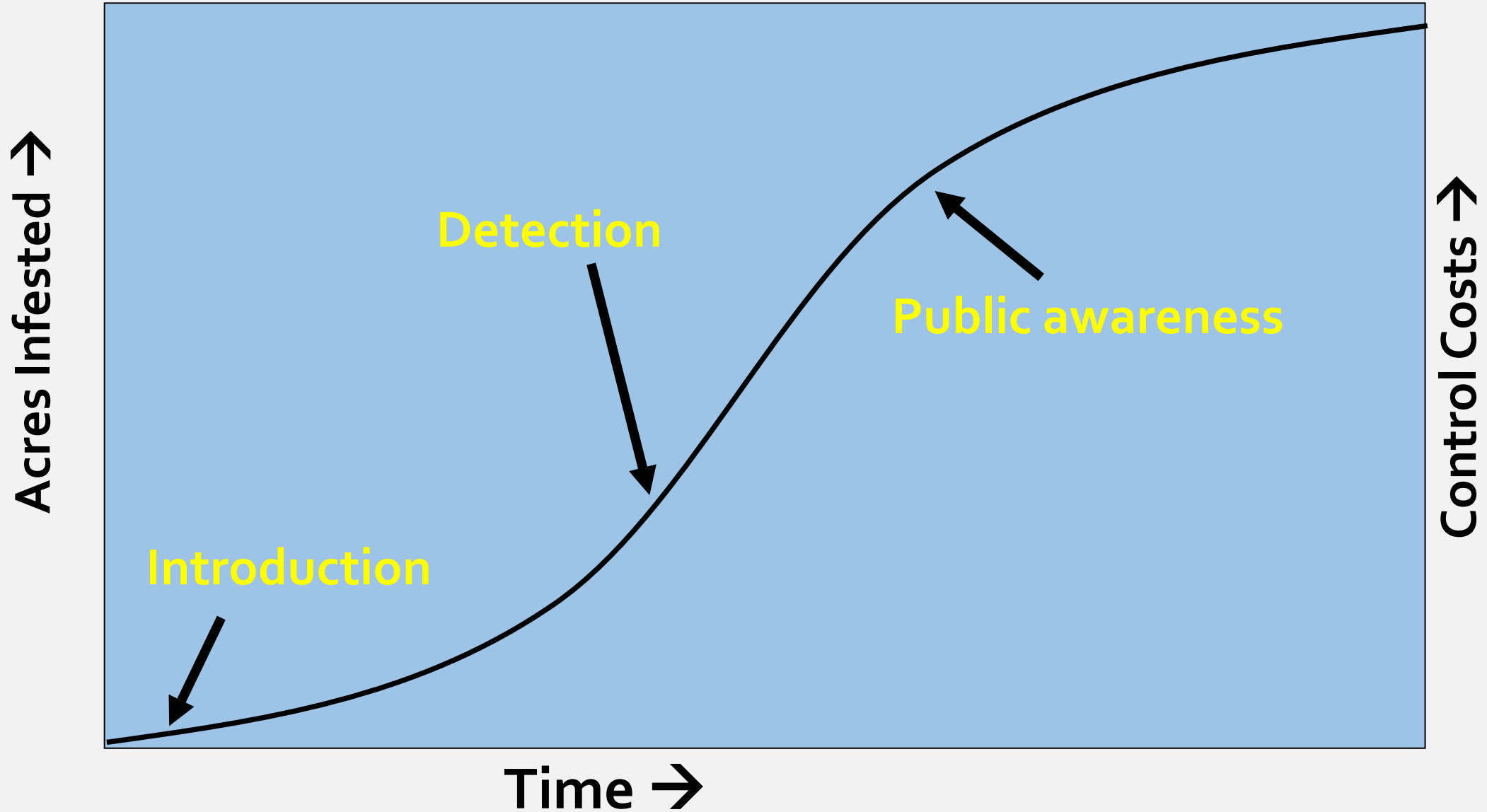


Majority of non-native species are not invasive





## 2) Spreading rapidly in new area





### 3) Ecological Impacts

- Loss of native plant species
- Poor wildlife habitat
- Bare soil → erosion
- Example: Buckthorn is allelopathic, has longer growing season, fruits spread widely by birds but are not nutritious





### 3) Economic Impacts

- Recreation industry
- Impacted timber regeneration
- Cost to manage infestations
- Example: Honeysuckle slows timber regeneration 15-30%





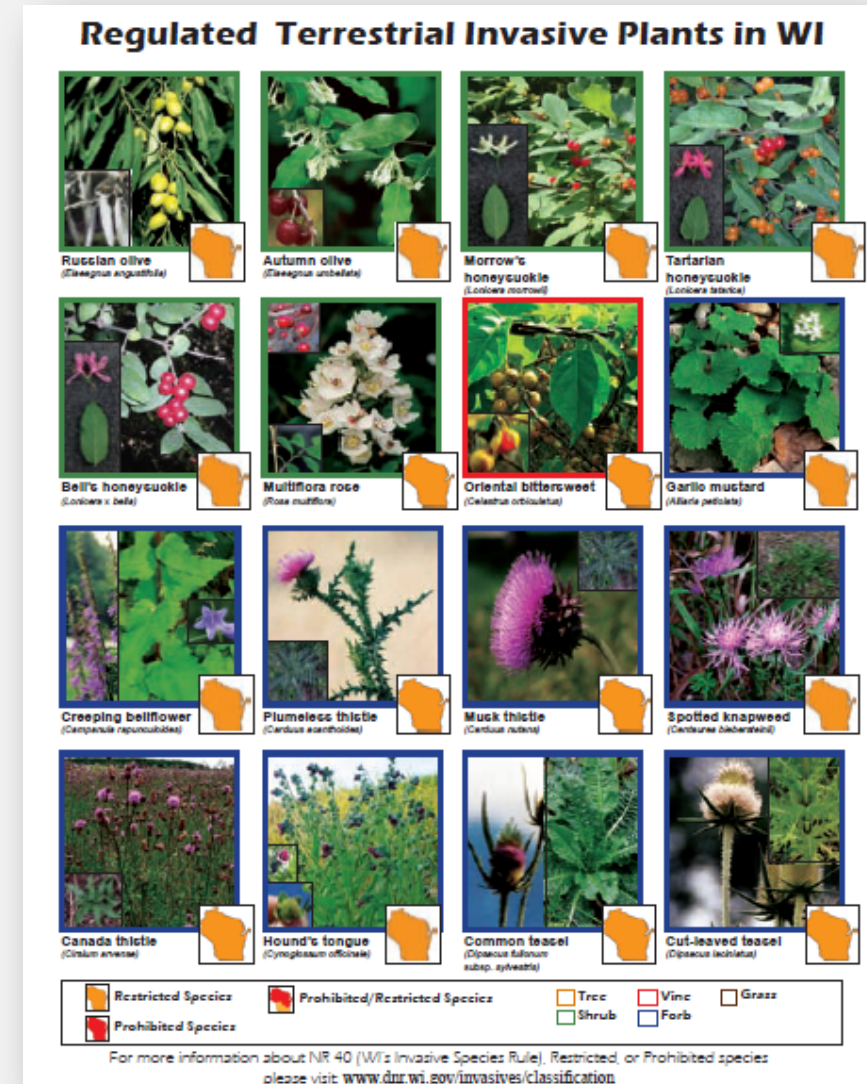
### 3) Human Health Impacts

- Difficult to walk through
- Impacts to skin (wild parsnip burn)
- Provide habitat for disease-carrying ticks
- Example: Japanese barberry is a spiny plant, associated with increased density of deer ticks



# Wisconsin's Invasive Species Rule- NR40

- Education about invasive species
- Goal to prevent introduction and spread
- Over 200 species regulated and classified as either "Prohibited" or "Restricted"





# NR40 Classification

## PROHIBITED



- Not yet established or only in pioneer stands
- No person may transport (import/ move), **possess**, transfer (buy/ sell) or introduce a prohibited species without a permit

## RESTRICTED



- Already established in state
- No person may transport (import/ move), transfer (buy/ sell) or introduce a restricted species without a permit

# PROHIBITED



# RESTRICTED



Find the list of regulated species  
at [dnr.wi.gov](http://dnr.wi.gov), search "NR40"





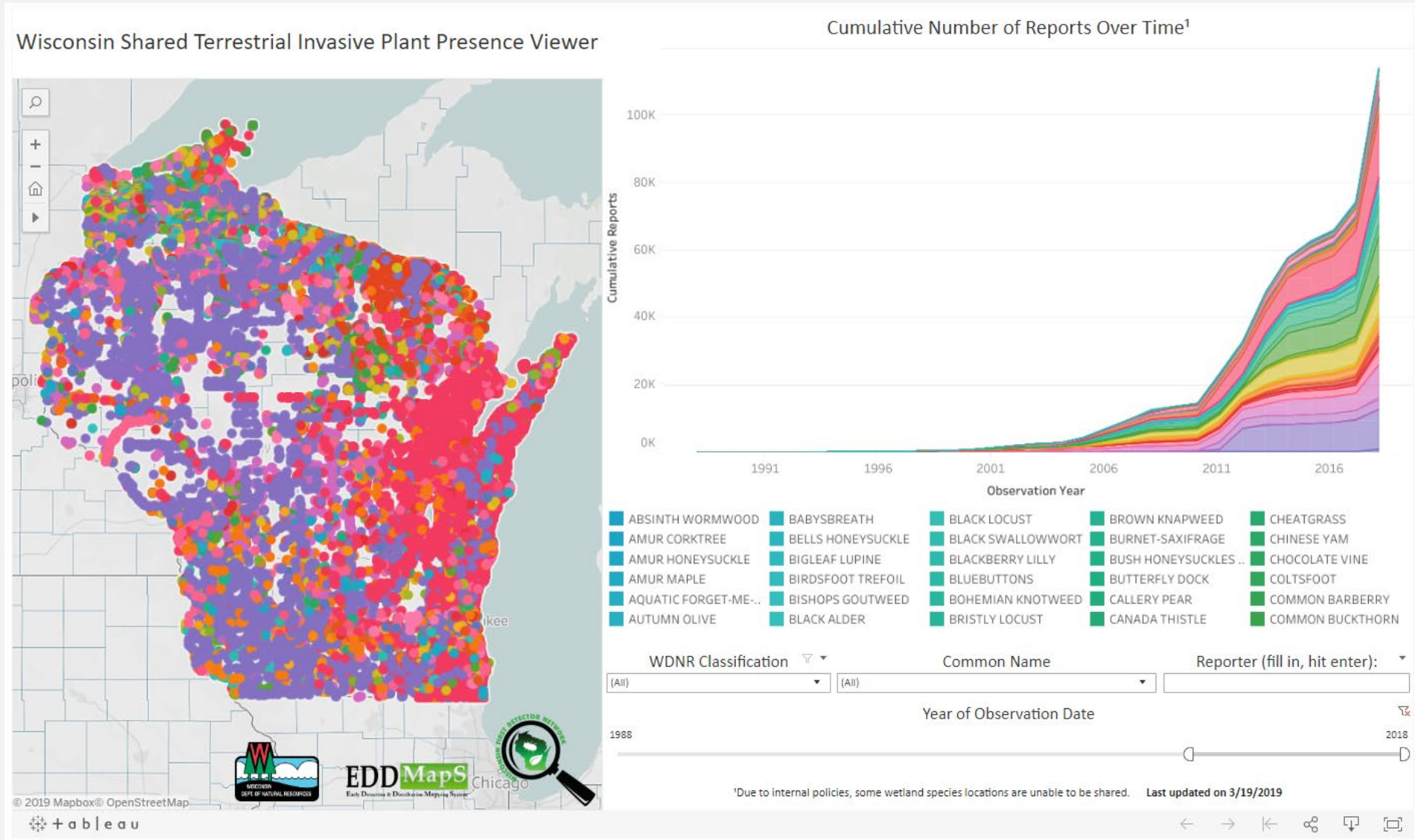
# What if I find a Prohibited species?

- Report it!
  - Date, pictures, location (GPS coordinates), physical sample
  - Report to DNR ([invasive.species@wi.gov](mailto:invasive.species@wi.gov)) and/or WIFDN ([wifdncoordinator@gmail.com](mailto:wifdncoordinator@gmail.com))
- Begin control ASAP

# **Invasive Plants in Urban Forests**



# What is Nearby → WISTIPP Viewer



# When to Look → Invasive Species Calendar

## Wisconsin Invasive Species Calendar

The Calendar provides an overview of when to look for invasive species based on the best available life stage & detectability information collected by WIFDN & partners. Exact timing of life stages & detectability will vary with weather conditions in a given year & across the state. We welcome your feedback to improve the accuracy of the calendar! Contact us at [WIFDNcoordinator@gmail.com](mailto:WIFDNcoordinator@gmail.com).



Use the dropdown lists to create a custom calendar

Habitat	Form	Detectability	Life Stage	Month	Scientific Name	Common Name
(All)	(All)	(Multiple valu...	(All)	(All)	(All)	(All)

Scientific Name	Common Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Acer tataricum</i>	Amur maple												
<i>Aegopodium podagraria</i>	bishop's goutweed												
<i>Ailanthus altissima</i>	tree of heaven												
<i>Alliaria petiolata</i>	garlic mustard-flowering year												
	garlic mustard-rosette												
<i>Ampelopsis brevipedunculata</i>	porcelain berry												
<i>Anthriscus sylvestris</i>	wild chervil-flowering year												
	wild chervil-rosette												
<i>Berberis spp.</i>	Japanese + common barberry												
<i>Campanula rapunculoides</i>	creeping bellflower												
<i>Carduus + Cirsium spp.</i>	biennial thistles-rosettes												
<i>Carduus acanthoides</i>	plumeless thistle												
<i>Carduus nutans</i>	musk thistle												
<i>Celastrus orbiculatus</i>	Oriental bittersweet												
<i>Corylus americana</i>	scottish hazelnut												

### Life Stage

- dormant or bare branches
- green vegetation present
- flowers present
- mature fruits or seeds present
- leaves changing color

Life Stage refers to the life stage of the species that is most dominant and/or most easily detectable in a given month.

### Detectability

- undetectable
- low
- medium
- high

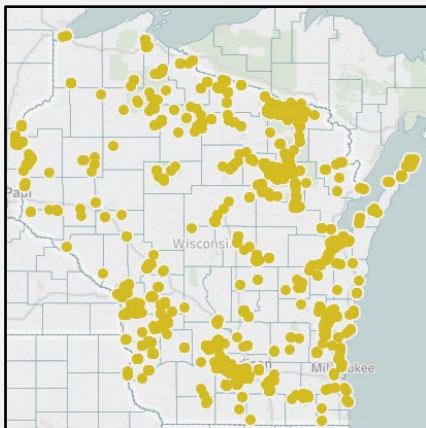
Detectability refers to how easy it is to find and/or identify the species in a given month.





# Garlic Mustard (*Alliaria petiolata*)

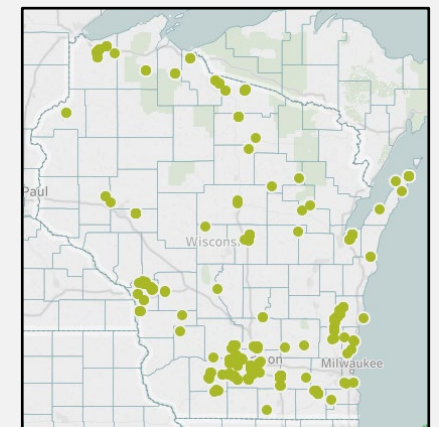
- Biennial
- Grows 2-4 ft tall
- 4-petaled white flowers
- Smells like garlic when crushed





# Dame's Rocket (*Heperis matronalis*)

- Short-lived perennial
- Hairy, toothed leaves
- **4-petaled** flowers from white to purple
- Blooms late spring through summer
- Long, slender seed pods

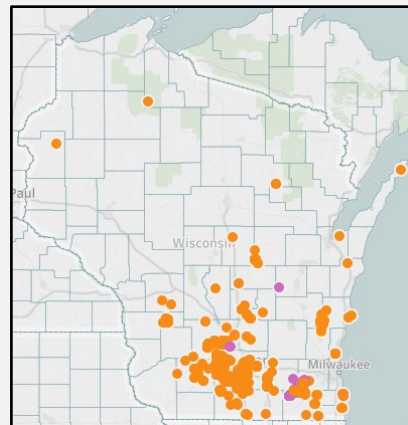




# Japanese Hedgeparsley (*Torilis japonica*)



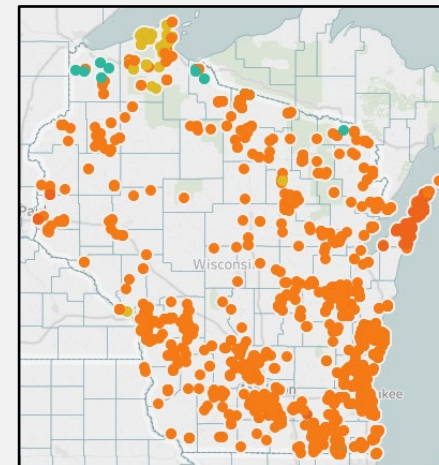
- Biennial
- Grows 2-6 ft tall
- Alternate, fern-like leaves
- Flat-topped umbels of tiny, white flowers bloom July – Aug
- Hooked hairs on fruits





# Japanese Knotweed (*Fallopia japonica*)

- Perennial, bamboo-like
- Arching stems, grow to 10+ ft tall
- Alternate, spade-shaped leaves, 3-4 in wide, 4-6 in long
- Plume-like clusters of tiny green to white flowers, August - September







Nisa Karimi, WI DNR



Peter M. Dziuk, minnesotawildflowers.info



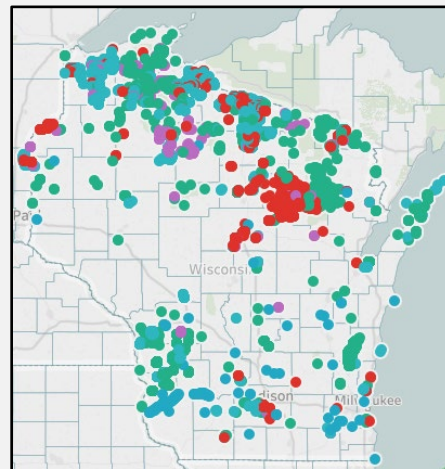
Leslie J. Mehrhoff, University of Connecticut, Bugwood.org





# Bush Honeysuckles (*Lonicera* species)

- Dense, multi-stemmed shrubs
- Grow 6-12' tall
- Opposite, toothless leaves
- Fragrant pairs of flowers at leaf axils
- Shaggy, peeling bark
- Hollow pith







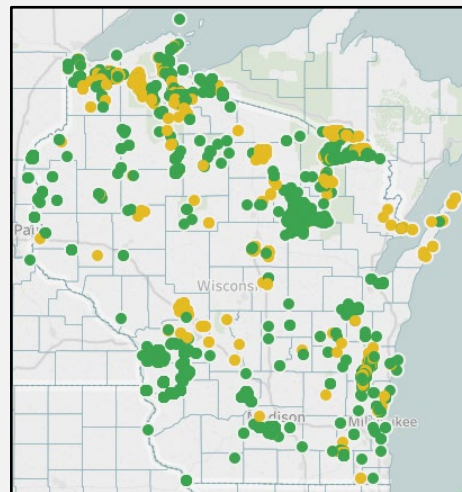
# Buckthorns

## Common Buckthorn (*Rhamnus cathartica*)

- Opposite leaves (mostly)
- 4-petaled flowers (May – June)
- Most aggressive in well-drained soils

## Glossy Buckthorn (*Frangula alnus*)

- Alternate leaves
- 5-petaled flowers (May – frost)
- Most aggressive in wet soils



## Common Buckthorn



## Glossy Buckthorn







# Japanese barberry (*Berberis thunbergii*)

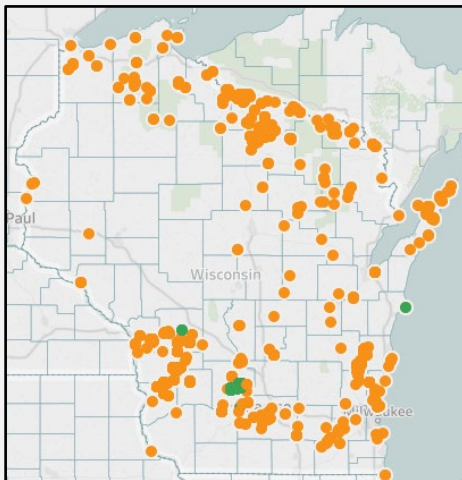
- Dense, spiny shrub
- Typically 2-3' tall, can grow to 6'
- Reddish brown branches, deeply grooved, zig-zag form
- Inner bark fluorescent yellow



Richard Gardner, UMES, Bugwood.org



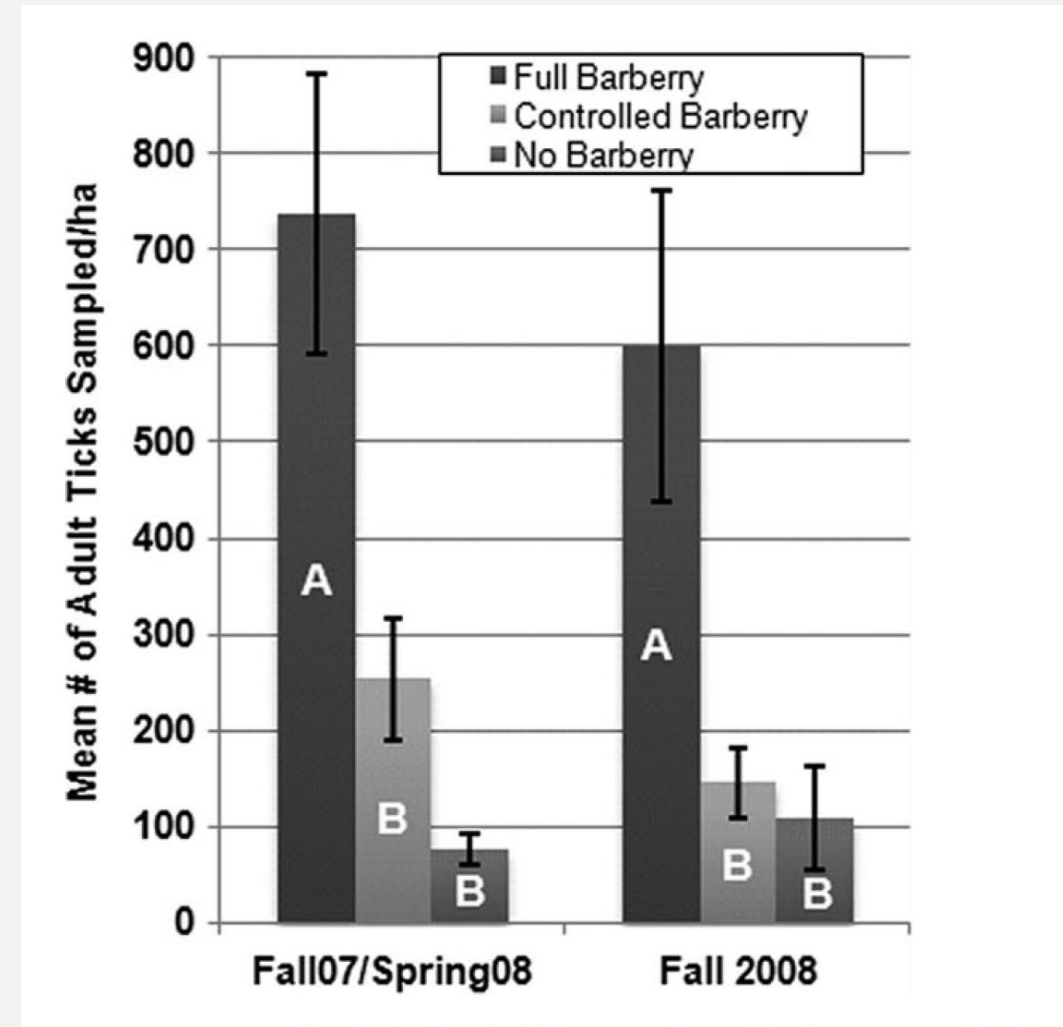
©2007 Gary Fewless



<http://www.health.state.mn.us/divs/idepc/dtopics/tickborne/ticks.html>

# Tick numbers and their relationship to Japanese barberry presence/control

- Treatments evaluated:
  - Full J. barberry populations (>60% cover)
  - Controlled J. barberry (3% cover)
  - No J. barberry (3% cover)
- Sampled over two years



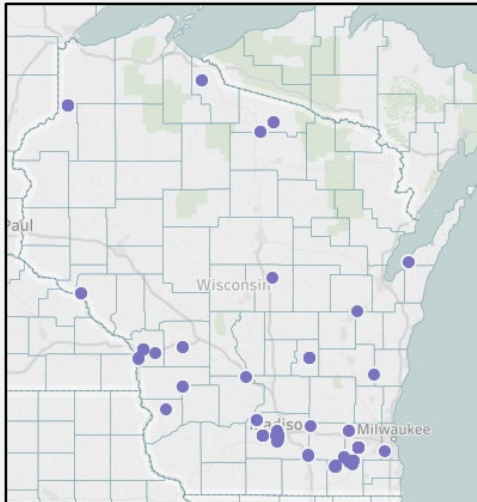
Williams et al. 2009





# Burning Bush (*Euonymus alatus*)

- Shrub, grows up to 20' tall
- Opposite leaves, bright red in autumn
- Distinct corky ridges along stem

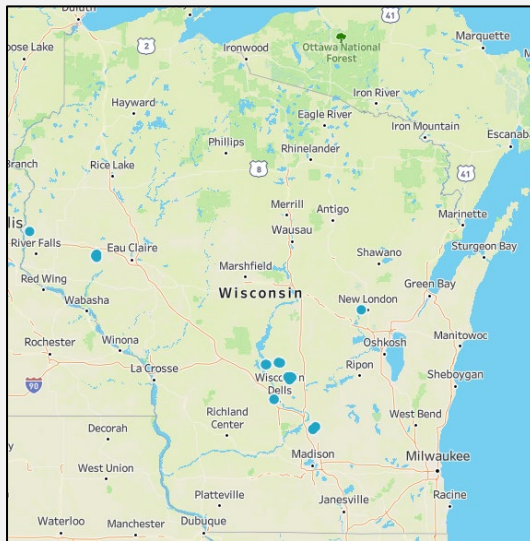






# Amur Cork Tree (*Phellodendron amurense*)

- Corky bark, bright yellow inner bark
- Opposite leaves, pinnately compound, smell citrusy when crushed
- Panicles of fruits on female trees





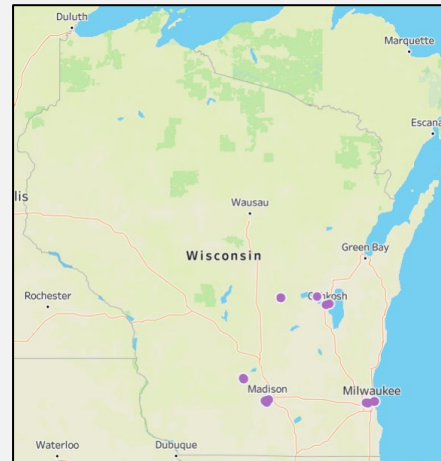


# Tree of Heaven (*Ailanthus altissima*)

- Alternate, compound leaves with 11-25 opposite leaflets
- Dense clusters of yellow-green flowers in late spring; develop into two-winged samaras
- Leaves, male flowers with strong odor
- Preferred host for spotted lanternfly (not yet found in WI)



Jan Samanek, State Phytosanitary Administration, Bugwood.org

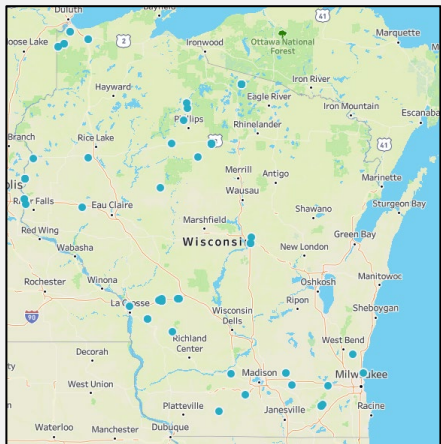


Chuck Barger, University of Georgia, Bugwood.org



# Amur Maple (*Acer ginnala*)

- Deciduous shrub/tree
- Grows 15-20 ft tall
- Opposite leaves with 3 lobes
- Bright red fall foliage



Paul Wray, Iowa State University, Bugwood.org

UGA0008223



Rob Routledge, Sault College, Bugwood.org

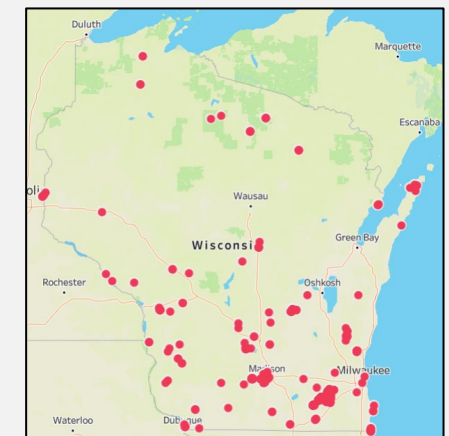
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# Oriental Bittersweet (*Celastrus orbiculatus*)

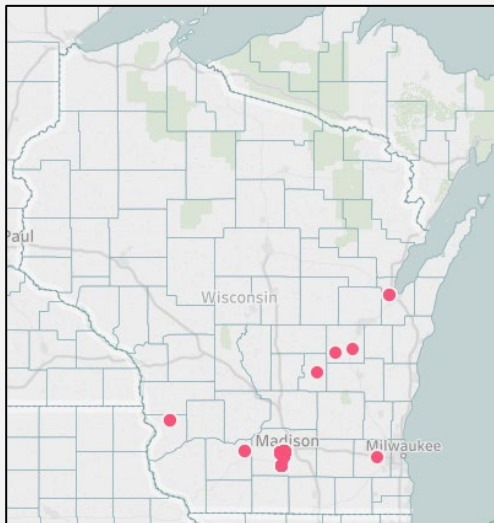
- Perennial woody vine
- Alternate, glossy leaves with pointed tip
- Clusters of flowers/fruits in leaf axils
  - native American bittersweet has clusters at ends of branches
- Orange fruits with yellow-orange capsules



# Porcelain Berry (*Ampelopsis brevipedunculata*)



- Perennial, woody vine
- Grows up to 15 feet in one season
- Young stems hairy
- Similar to native wild grapes



Leslie J. Mehrhoff, University of Connecticut, Bugwood.org





## Porcelain berry

- Branched tendrils
- **White pith**
- Ridged/furrowed bark
- **Fruits pink to purple to blue; white or gray spots; white flesh**



## Wild Grape

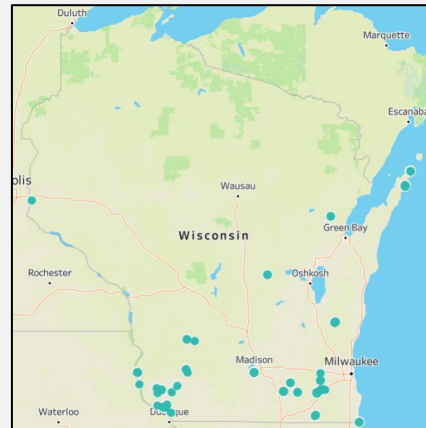
- Unbranched tendrils
- **Brown pith**
- Shredded bark
- **Fruits green, purple, black; watery flesh**





# Black Swallow-wort (*Vincetoxicum nigrum*)

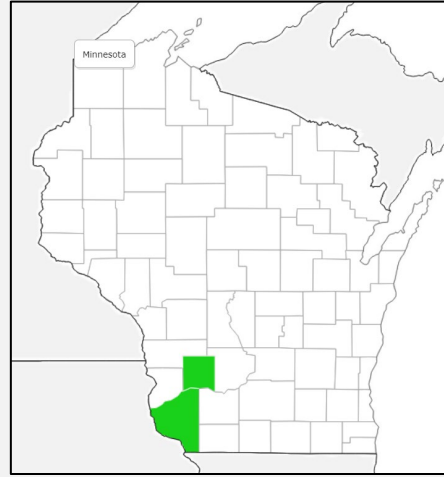
- Perennial, herbaceous vine
- Grow 3-6' long; hairy stems
- Opposite dark green shiny leaves, 2-5" long
- Clusters of 6-10 dark purple flowers with 5 points
- Seed pods similar to milkweed





# Goldencreeper (*Thladiantha dubia*)

- Fast-growing perennial, herbaceous vine
- Grows from tubers, climbs with tendrils
- Hairy leaves
- Blooms July – Sept
- Member of cucumber family



# **Invasive Plant Management**



# Which invasive plants impact your goals?

Difficult to answer as impacts of invasive species are:

- Species specific
- Location specific
- Density specific



# Which invasive plants impact your goals?

## Species to prioritize:

1. Species that increase potential to harm humans
2. Species that have documented ecosystem impacts
  - Reduce forest regeneration, biodiversity, nutrient cycling
3. Species that are just establishing
  - Can easily be eradicated

→ Work with experts to help with prioritization



# Mark's List of invasive plants to keep out of WI forests

## Forest ecosystem changers

- bush honeysuckles\*
- autumn olive
- Japanese barberry\*
- black locust
- common/glossy buckthorn
- garlic mustard
- multiflora rose

## Early detection species

- black swallow-wort
- Japanese hedge parsley
- tree-of-heaven
- burning bush
- Asian bittersweet
- Porcelain berry
- Lesser celandine
- Amur corktree

\*Known to directly or indirectly cause impacts to human health



**Consider resources available and what you want the result to be BEFORE management.....**





# Approach to managing invasive plants

**Step 1:** Plant identification

**Step 2:** Distribution of population

**Step 3:** Select appropriate control tactic(s)

**Step 4:** Apply control method(s)

**Step 5:** Monitor and adapt management

# Many control tactics

- Manipulation of the environment
- Physical/mechanical management
- Prescribed fire
- Biological control
- Herbicide





# What techniques should I be familiar with to control woody species?

- Something to cut down woody species
  - Chainsaw
- Something to pull them out of the ground
  - Weed wrench/pulling implement
- Something to spray herbicide
  - Foliar, Basal bark, Cut stump/surface



# Mark's Tips for invasive plant management planning

1. Monitor for new species entering your lands every year
  - If you find one, evaluate the benefit/risk of doing nothing
  - If you can't identify a new plant, ask an expert
  - Find source populations and minimize spread
2. Manage invasive plants based on your personal goals for the land
  - Keep invasive plants known to impact woods out of your forest
  - For larger problems think about a multi-year approach
3. Utilize experts and science-based publications to assist your needs
  - People will help, just ask!
4. Incorporate invasive plant management into your forest management plan
  - Easy structure to include information



# **Invasive Plant Organizations**

# Local Groups- CISMAs/CWMAs

- Organizations that bring together government, non-profit, private industry, landowners
- Coordinate action/share resources to manage invasive species
- More info at [ipaw.org](http://ipaw.org)

Regional Invasive Plant Groups in Wisconsin  
(Cooperative Weed Management Areas)  
As of January, 2019

**Regional Group Names**





# Statewide Groups- WIFDN and IPAW

## WI First Detector Network:

supports invasive species  
education + citizen science  
volunteer opportunities

[fyi.extension.wisc.edu/wifdn](http://fyi.extension.wisc.edu/wifdn)



## Invasive Plants Assoc. of WI:

supports invasive species  
education + acts as  
umbrella org. for CISMAs

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

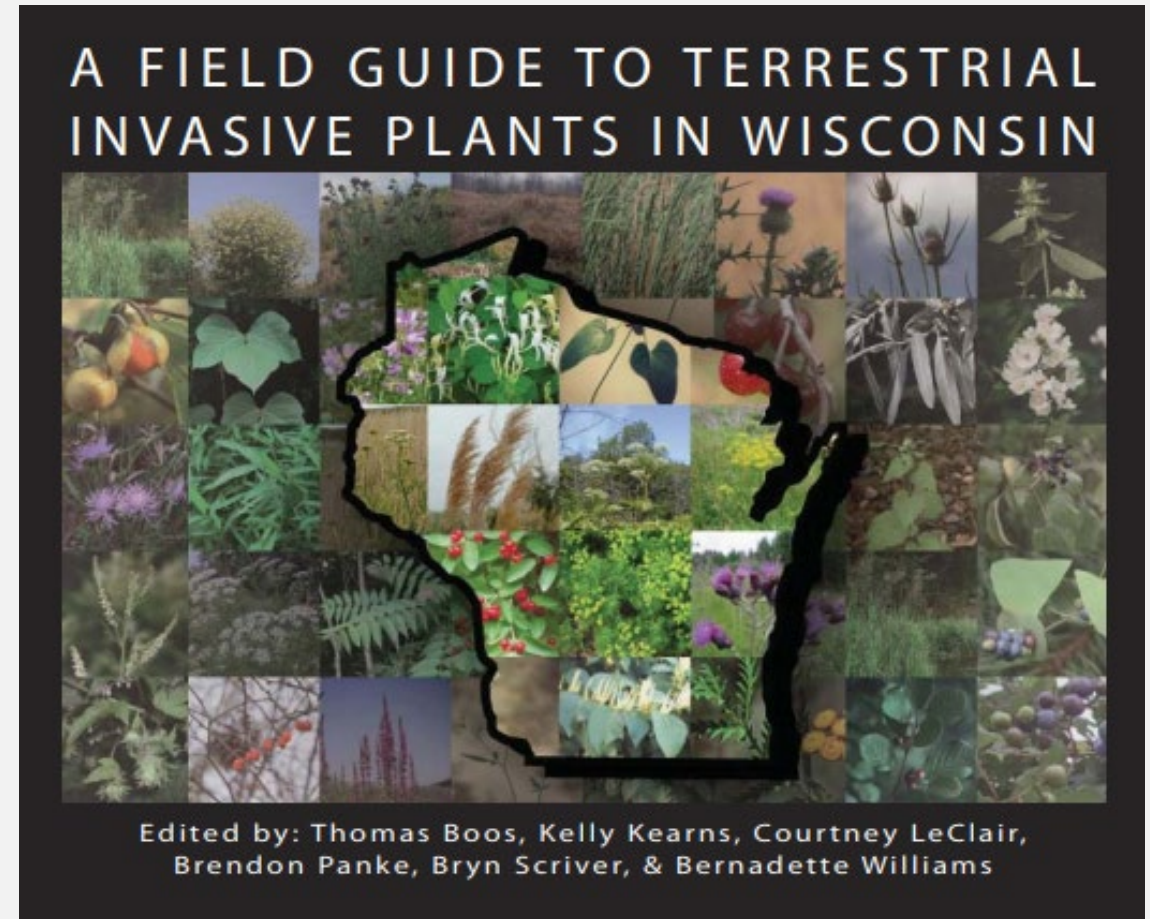


# **Additional Resources**



# Plant I.D. Resources

- WI DNR Terrestrial Invasive Plants Field Guide
- UW Extension fact sheets and I.D. videos
- Wisconsin Weed I.D. ([weedid.wisc.edu](http://weedid.wisc.edu))
- Minnesota Wildflowers advanced search ([MinnesotaWildflowers.info](http://MinnesotaWildflowers.info))



# Mapping Invasive Plants with EDDMapS Website + GLEDN App

- Free database + app for mapping, downloading + sharing data
- WIFDN provides training + support!





# Invasive Plant Research



Renz Weed Science  
COLLEGE OF AGRICULTURAL & LIFE SCIENCES  
UNIVERSITY OF WISCONSIN-MADISON



Extension  
UNIVERSITY OF WISCONSIN-MADISON

YOUR UW



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## WE RESEARCH WEEDS AND INVASIVE PLANTS IN THESE SETTINGS:



ALFALFA



PASTURES



NATURAL AREAS / INVASIVE PLANTS

[RenzWeedScience.cals.wisc.edu](http://RenzWeedScience.cals.wisc.edu)



# Thank you!



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