



# EMERGING INVASIVE PLANTS THREATENING OUR FORESTS

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# Emerging Species

- Oriental Bittersweet
- Japanese Barberry
- Winged Euonymus
- Multiflora Rose
- Autumn Olive
- Japanese Knotweed
- Garden Valerian





# Oriental Bittersweet - *Celastrus orbiculatus*

- Woody, twining vine, up to 60' long & 6" in diameter
- Leaves, alternate, finely toothed, elliptical to ovoid & shiny
- Yellow capsules around red berries develop at leaf nodes
- Found in Duluth, Metro &, SE





# American bittersweet (native)



# Similar Leaves Oriental bittersweet (invasive)

Orange  
capsules



Berries  
at end of  
branch

Leaves  
unroll like  
a scroll



Yellow  
capsules

Berries at  
each leaf  
axil

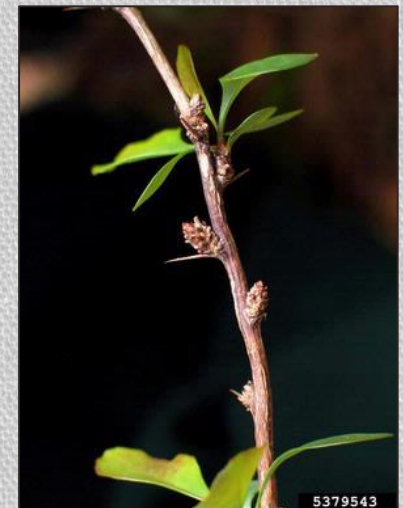


Leaves  
unfold like  
a book



# Japanese Barberry – *Berberis thunbergii*

- Small rounded leaves, in clusters above single spines
- Yellow flowers, in clusters in May
- Red, egg-shaped berries, in pairs
- Seeds dispersed by birds
- Spreads vegetatively - lower branches root freely.
- Naturalized plants may have green rather than purple leaves.





# Japanese Barberry – Continued

## *Winter Characteristics*

- Purple-red fall foliage on multi-stemmed spiny shrub, 3-6' tall
- Arching grooved or angular stems
- .5" spine at each leaf node
- Berries can persist through the winter





# Winger Euonymus – *Euonymus alatus*

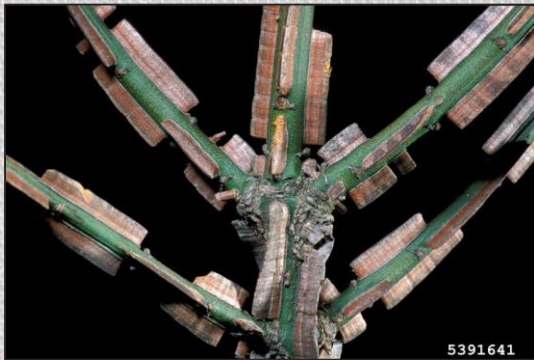
- Also known as ‘burning bush’ or ‘winged spindle’
- Upright, multi-stemmed, 5-10’ tall w/ corky, often winged stems
- Opposite. 1-3” leaves, finely serrate
- Beware of the native Eastern Wahoo, *E. atropurpureus*





# Winger Euonymus – Continued

- Inconspicuous flower, red-purple berries through fall
- Brilliant red fall leaf color





# Multiflora Rose – *Rosa multiflora*

- Perennial shrub, 4–10' tall forming large thickets
- Pinnately compound, alternate leaves, 5–11 oval dark green leaflets, serrated margins, with frilled stipules
- Stems, long & arching, without hairs, having stout curved red/brown thorns throughout



Chris Evans, River to River CW



©2002, Gary Fewless



James H. Miller, USDA Forest Service, Bugwood.org UGA2307116





# Multiflora Rose – Continued



- 5 petaled showy, fragrant white (sometimes pink) flowers in June
- Fruits bright red, .25", visible fall & winter
- Reproduces primarily by seed
- Can sprout from roots & canes touching the ground
- Thorns curve backwards like cats' claws





# Autumn Olive – *Elaeagnus umbellata*

- Perennial shrub or small tree also known as Japanese silverberry or spreading oleaster
- 3.5m tall w/ a dense crown
- Sharp thorns on spur branches
- Alternate leaves, green above, silvery pubescent below w/ wavy margins





# Autumn Olive – Continued

- Fragrant yellow-white flowers at leaf axils, 4-lobed
- Unripe fruit are silvery, turning red dotted w/ silver or brown
- Berries are edible, tart, make good dried fruit





# Knotweeds – *Polygonum* spp

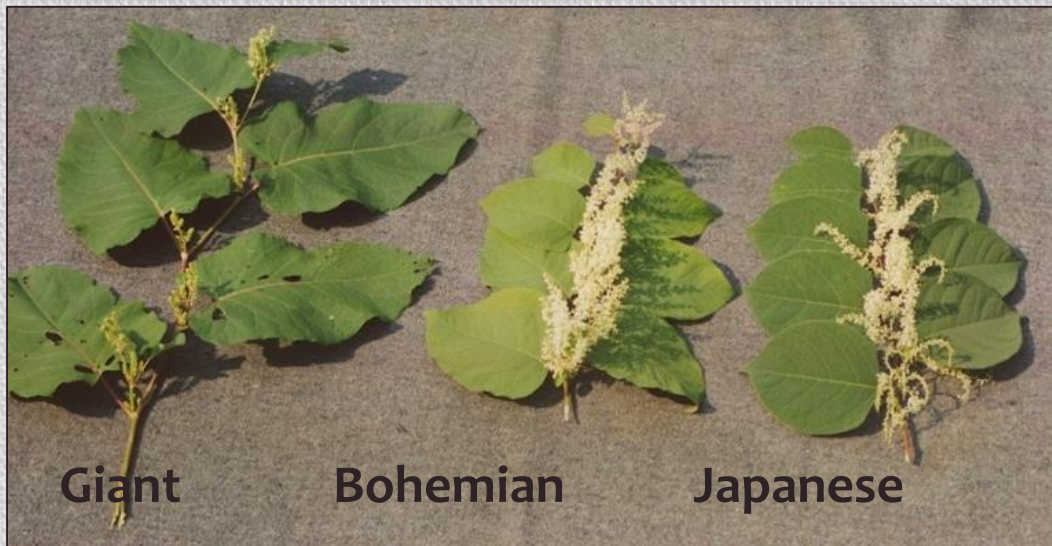
- Japanese 6-9' tall
- Fast growing, hollow, bamboo-like stems
- Large, alternate simple leaves
- Tufts of white flowers in Aug & Sept
- Flower stalks longer than leaf blades
- Spreads by stem & root pieces & rhizomes





# Knotweeds – Continued

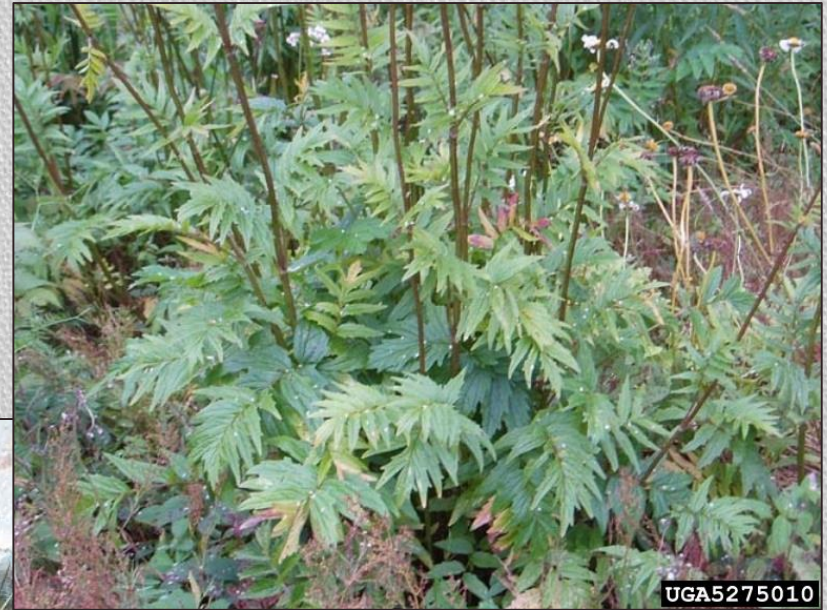
- Giant >12'; Bohemian = Japanese x Giant, more likely to produce viable seed
- Leaves underside hairy on Giant knotweed
- Bohemian leaf midribs have hairs
- Giant flower stalks shorter than leaf blades





# Garden Valerian – *Valeriana officinalis*

- Also known as garden heliotrope
- Herbaceous perennial, 1-4' tall
- Tolerates both dry & wet sites
- Emergences in early spring
- Readily self-seeds





# Garden Valerian – Continued

- Opposite, pinnately compound leaves, hairs on underside
- Pungent, fibrous roots with rhizomes
- Pubescent stems
- Fragrant umbel-like flowers





# Tobacco root – *V. ciliata* or *V. edulis* var. *ciliata*

- Threatened (1984) native, moist fen, meadow & prairie spp
- Long-lived perennial, but spreads only by seed
- 5-petaled whitish flowers May-Sept, 3 stamens & 3-lobed stigma.
- Sepals are distinctive feather-like bristles that expand when seed matures.
- Leaves are thick w/ parallel veins, fringed with marginal hairs





A stylized, dark brown illustration of a plant with several large, oval leaves and a cluster of small, round fruits or berries on thin stems, positioned on the left side of the slide.

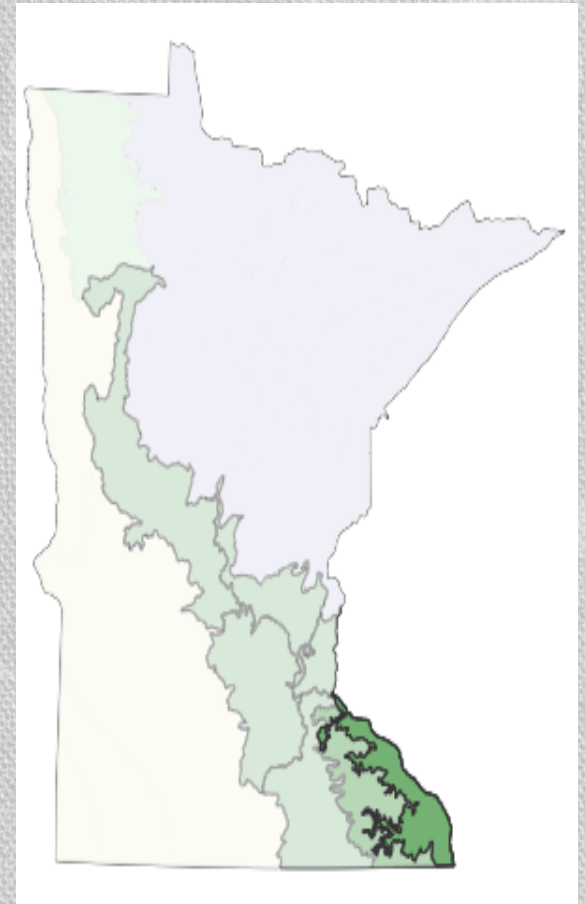
Val Green, MNDNR, Forestry

# EMERGING INVASIVE PLANTS IN SE MN



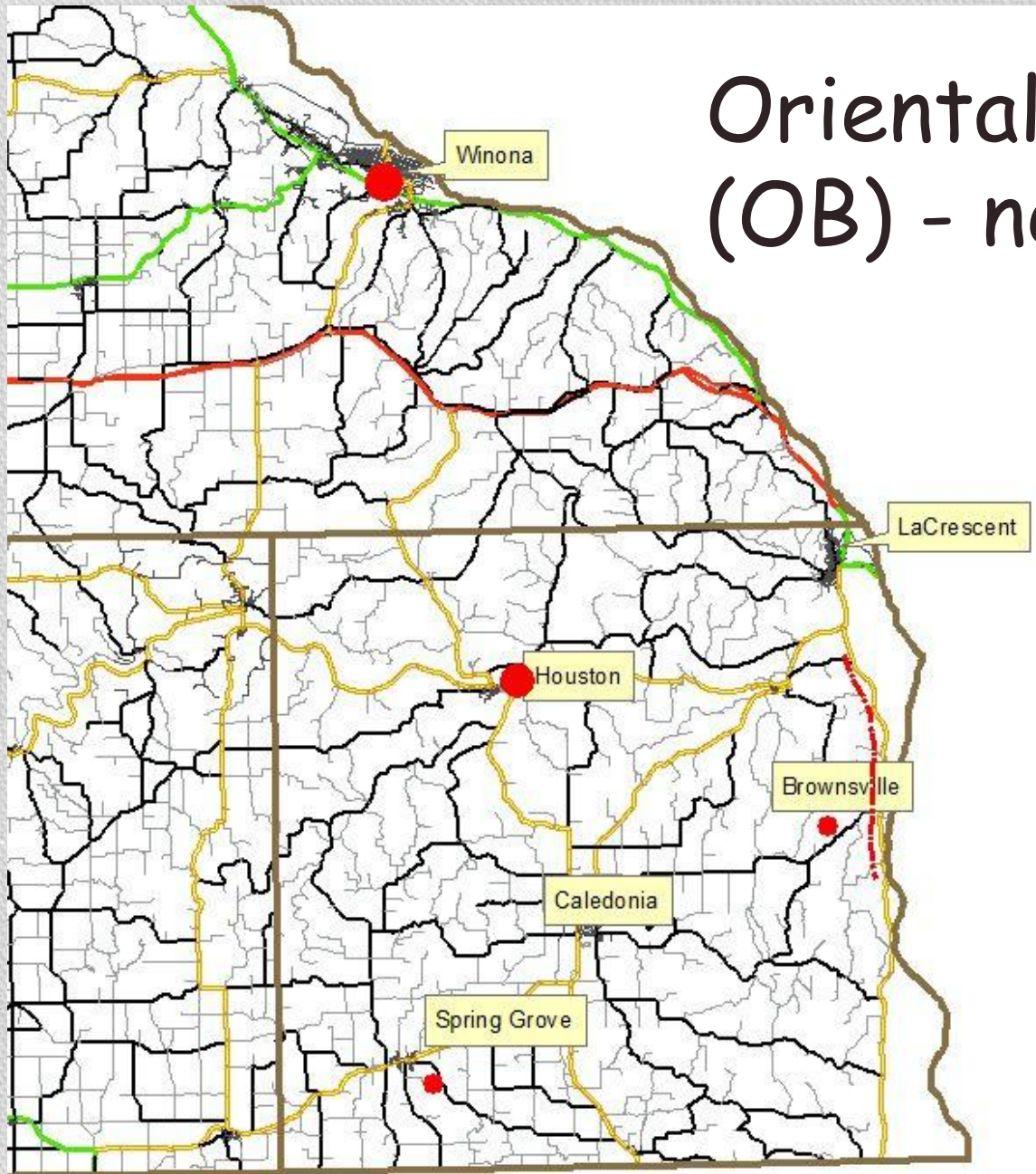
# "Newer" Woody Invasive Exotics in SE MN (Driftless)

- Oriental Bittersweet
- Japanese Knotweed
- Japanese Barberry
- Multiflora Rose





# Oriental Bittersweet (OB) - newest exotic





# OB in Winona





# OB - pine plantation





# Highway 26 (along Mississippi)





# Oriental Bittersweet Control Options

- burns??
- Pull small seedlings; leave no root parts
- Triclopyr (Garlon)  
basal on larger plants  
and foliar on small at  
same time



# Japanese Knotweed

## - Beyond "usual" effects

### **Japanese knotweed invasion is halting house sales as buyers are denied mortgages on blighted properties**

- Homeowners are facing bills of up to £20,000 to remove plant before they can sell
- Weed can grow more than 9ft in just ten weeks and can damage foundations and drains
- Barclays Bank declines mortgage applications unless the knotweed is removed

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By [LARISA BROWN FOR THE DAILY MAIL](#)

**PUBLISHED:** 17:52 EST, 19 July 2013 | **UPDATED:** 20:13 EST, 20 July 2013



# Knotweed-near Hokah



Minn Dept of Ag



# Knotweed at Hokah bridge





# Knotweed NW of Houston





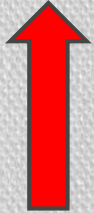
# Japanese Knotweed Control

>3 years

- Mowing/cutting/pulling  
-only if repeated AND  
clippings are collected  
& burned
- ?? Smother with very heavy black plastic
- Cut stem or stem injection-50% glyphosate (Roundup) (IA)
- Foliar: aminopyralid (Milestone) only when flowering or
- Foliar: imazapyr (Arsenal or Polaris); best results Sept before frost or



# Japanese Barberry - Beyond "usual" effects



Barberry higher moisture microclimate increases deer ticks:

<https://www.youtube.com/watch?v=ZA7r2kMO2Z0&feature=youtu.be>



# Barberry-near Brownsville & Hokah





# Barberry near Hokah & New Albin IA





# Multiflora Rose (MFR)

- "Living fence"
- Throughout Houston County and whole SE
- Somewhat less shade intolerant than barberry
- Former pastures



# MFR-many locations





# MFR & Barberry Control Options

- Grazing repeatedly
- Repeated low mowing for years
- Grubbing
- Hot burns
- Basal: Triclopyr (Garlon 4 Ultra)  
\*\*\*\*\*
- Foliar: Metsulfuron methyl 60% (Escort)
- Foliar: aminopyralid + 2,4-D (Grazon)  
\*\*\*\*\*



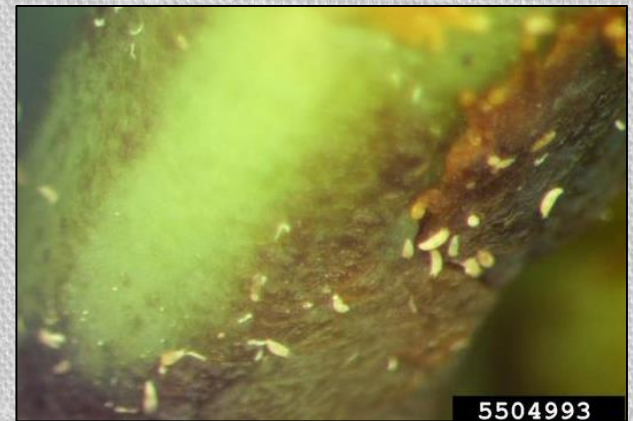
# Mechanical *reduction*





# MFR Biological- rose rosette disease

Caused by a virus carried by  
an eriophyid mite.





# Observed Downfalls

- Goats killing larger cherry and apple trees
- Foliar applications when uptake was poor (powdery mildew)
- Inadvertent spread of seed/pieces
- Damage to non-targets

Get 'Em Early & Small





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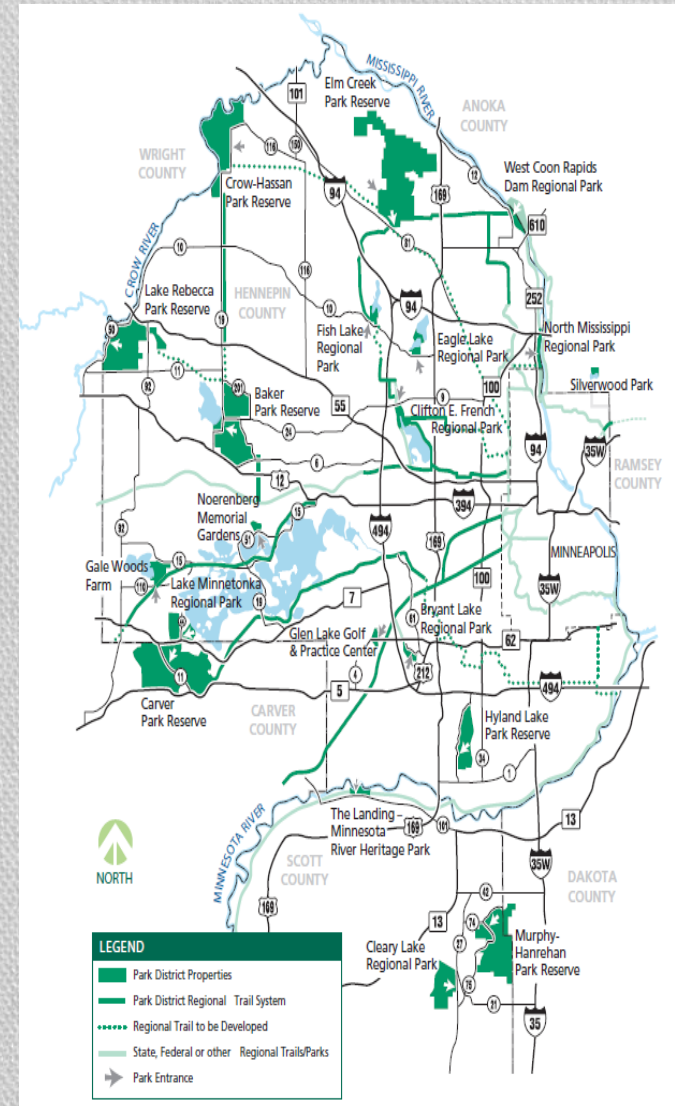
Angela Isackson, Three Rivers  
Park District

# EMERGING INVASIVE PLANTS IN THE METRO AREA OF MN





- Hennepin, Carver, Scott, Ramsey, and Dakota County
- Over 20 Parks (7 Park Reserves) totaling over 27,000 acres
- Invasive Species Coordinator new position started in 2013
  - Dedicated Conservation Corp Crew serves various projects





# Emerging Species

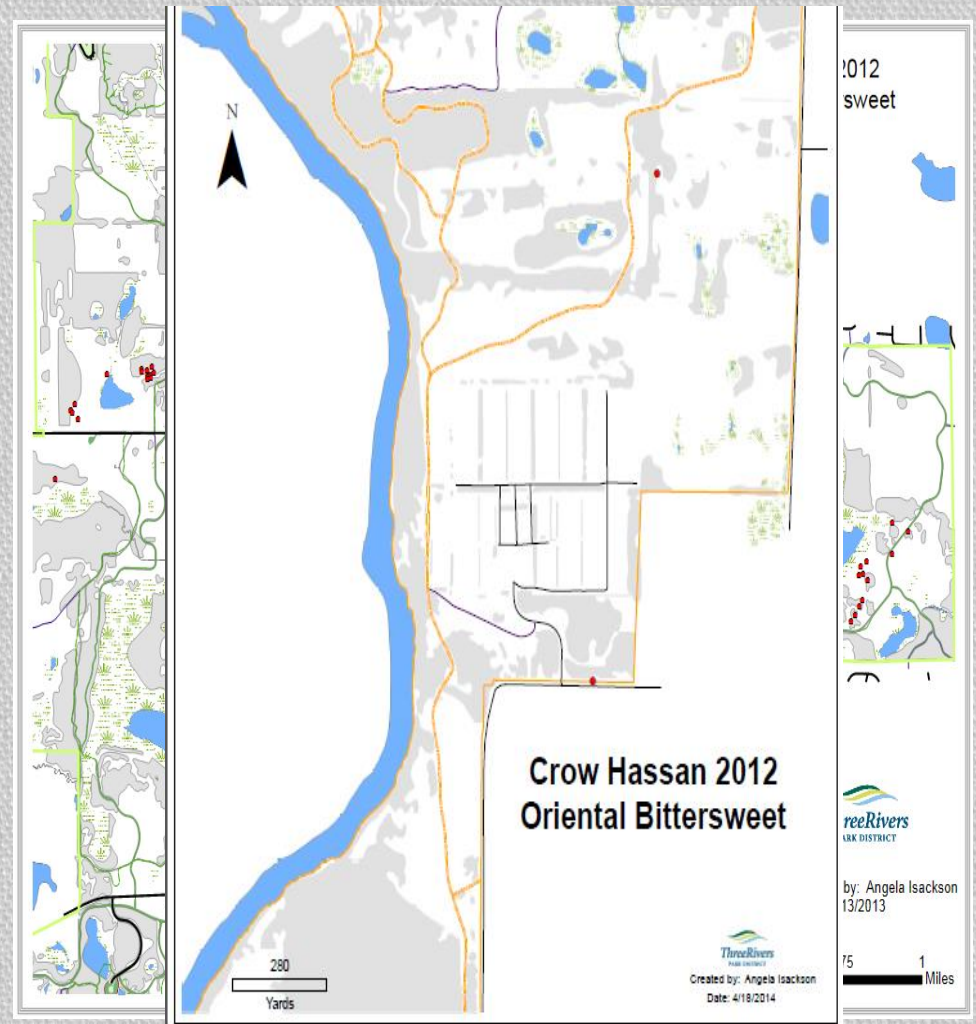
- Oriental Bittersweet
- Japanese Barberry
- Winged Euonymus
- ~~Multiflora Rose~~
- Autumn Olive
- ~~Japanese Knotweed~~
- Garden Valerian



# Oriental Bittersweet

## Initial Find

- Crow Hassan Park Reserve – 2011
- Elm Creek Park Reserve - 2012
- Started with approximately 4 known infestations at 2 parks





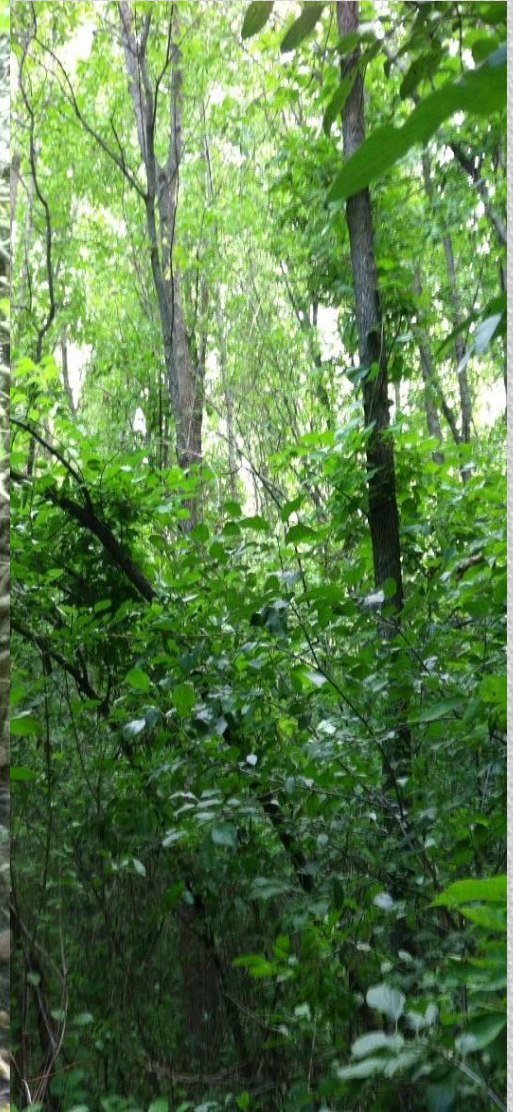
# Oriental Bittersweet

## Results

- Elm Creek – 40 acres
- Carver – 1 acre
- Baker - .5 acres
- Lake Rebecca - .5 acres
- Crow Hassan - .5 acres



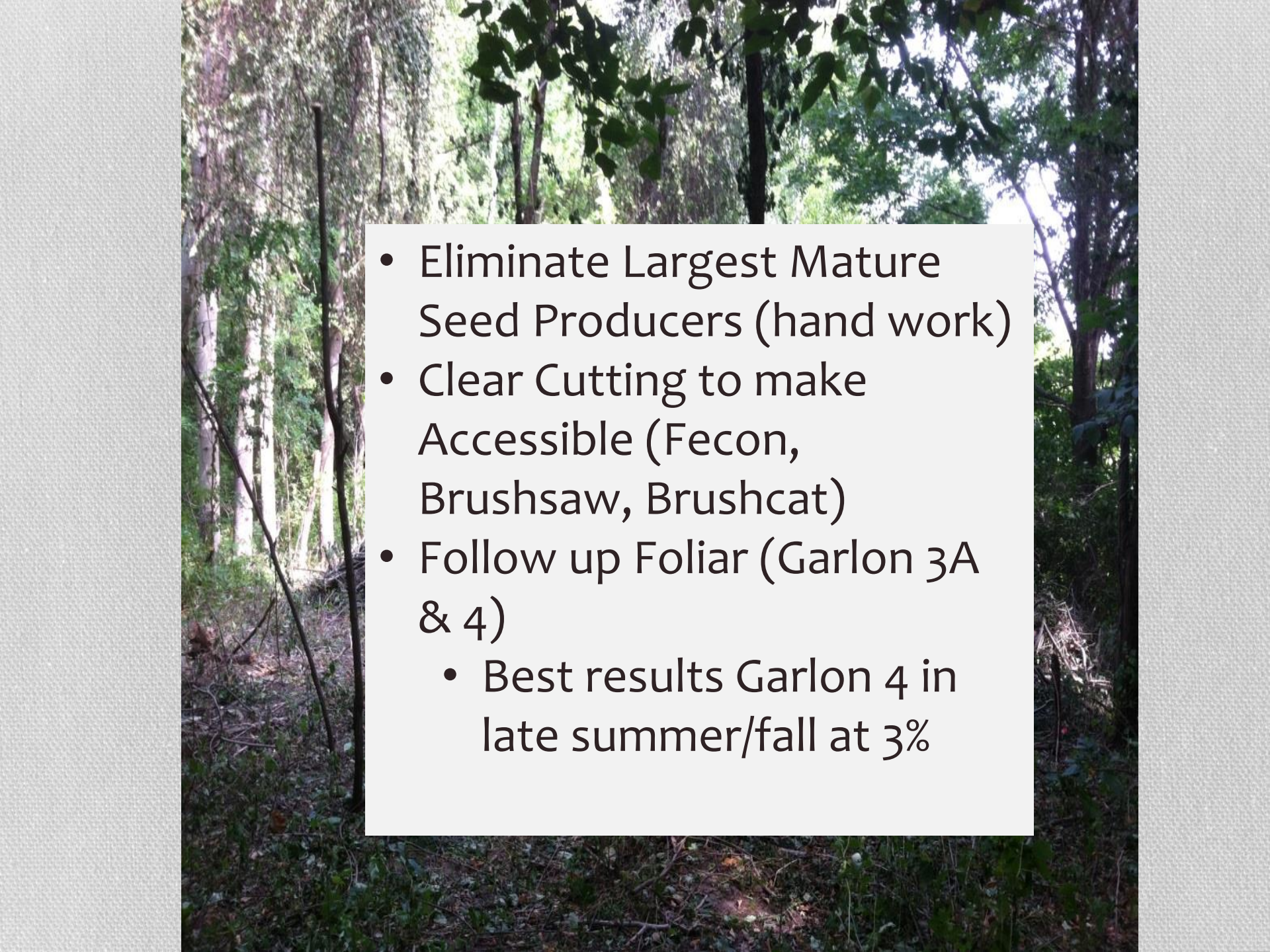










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- Eliminate Largest Mature Seed Producers (hand work)
  - Clear Cutting to make Accessible (Fecon, Brushsaw, Brushcat)
  - Follow up Foliar (Garlon 3A & 4)
    - Best results Garlon 4 in late summer/fall at 3%





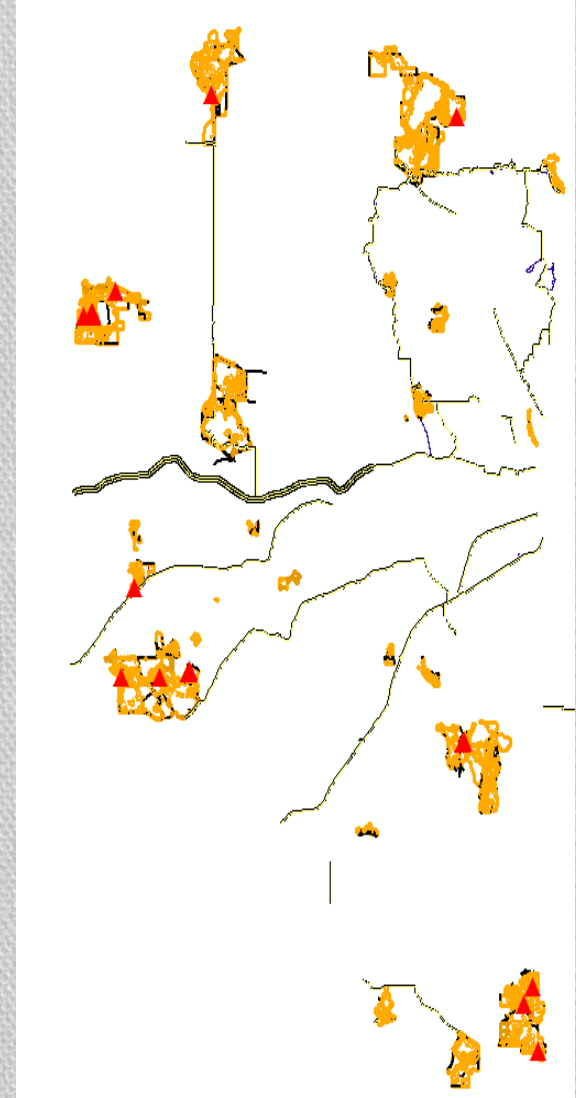


# Future Work Sites





# Japanese Barberry



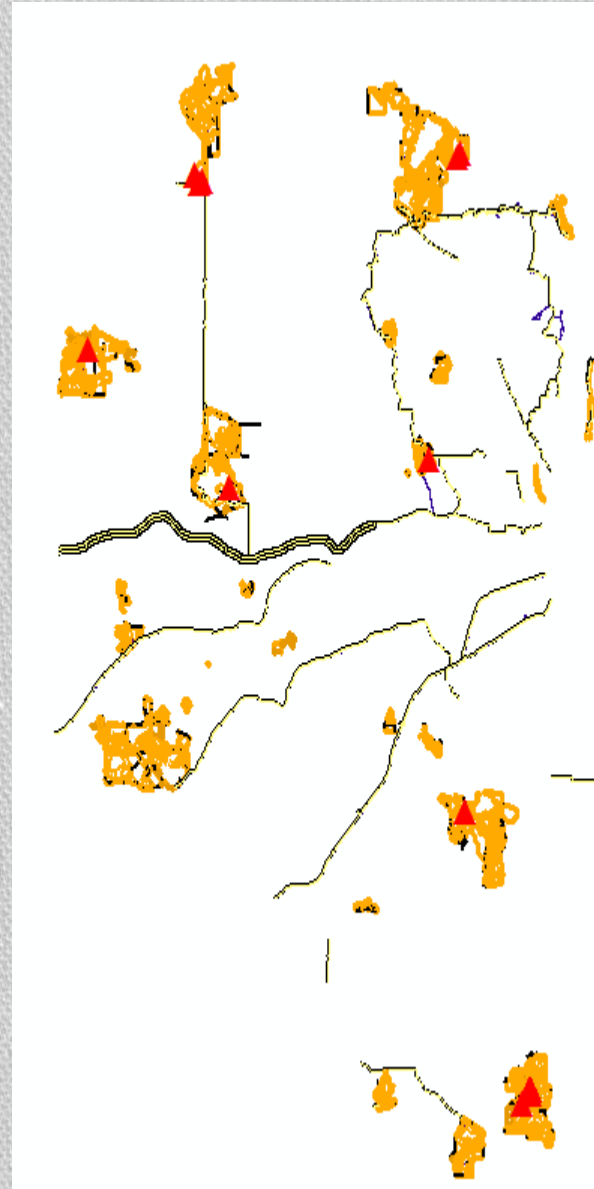




- Homestead Sites
- Seems occasional and innocent at first...
- Cut/stump with Garlon
- Follow up with hand pulling on rain days



# Winged Euonymus







- Homestead Sites
- Seems occasional and innocent at first...
- Cut/stump with Garlon
- Follow up with spot spraying and fire



# Autumn Olive

## Findings

- 5 Parks with confirmed Autumn Olive
- Fast growing and spreading quickly; over 40 acres infested at Crow Hassan Park Reserve
- Promoted as wildlife food in earlier plantings












- Birds spread it, check open early successional areas and under cedar trees
- Nasty to cut, thorns, tends to die back and resprout, loves to grow in prickly ash
- Not as shade tolerant as Buckthorn



A stylized, dark brown illustration of a plant with several large, elongated leaves and a cluster of small, round fruits or berries on thin stems, positioned on the left side of the slide.

Jeffrey Flory, 1854 Treaty  
Authority

# EMERGING INVASIVE PLANTS IN NE MN

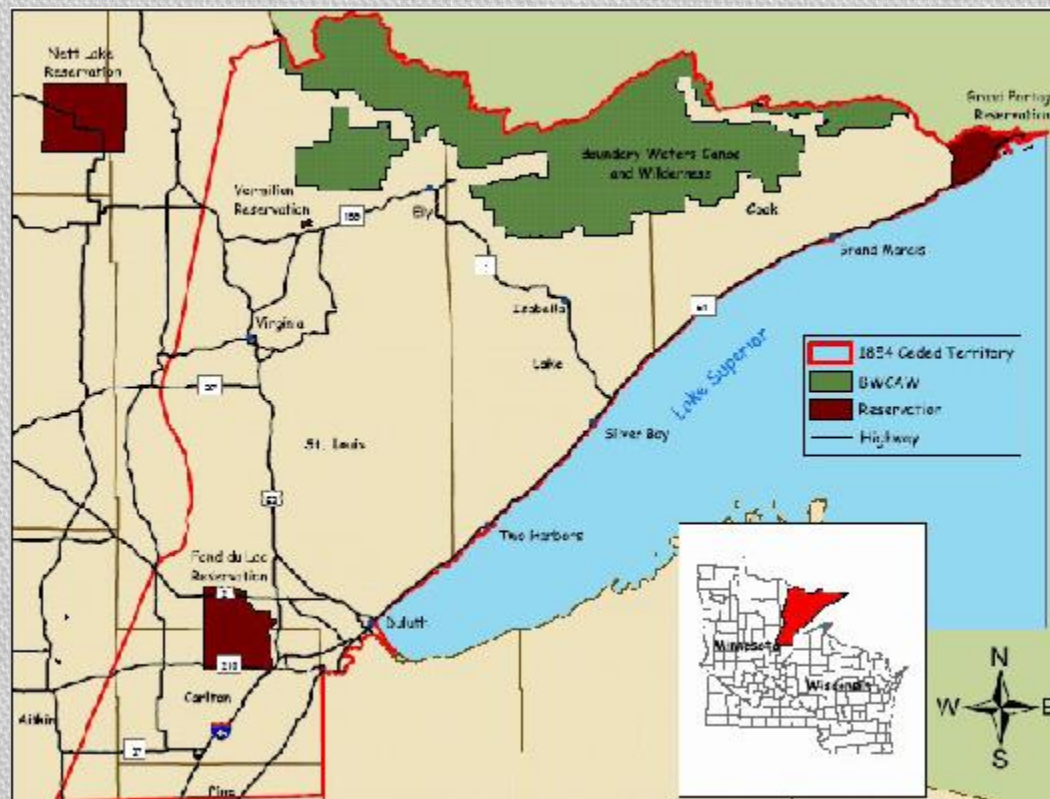


# 1854 CEDED TERRITORY

## MINNESOTA'S ARROWHEAD REGION

What are some of our up-and-coming invasive species?

- Japanese Barberry
- Knotweed species
- Garden Valerian
- Oriental Bittersweet
- Pimpinella saxifraga
- European Highbush Cranberry



5.5 million acres of land within the ceded territory



# Japanese Barberry

- Many escaped cultivation
- Five miles SW of Two Harbors, MN is another story:



- 3 acres of dense, monoculture thickets
- A minimum of 8 acres of low density, possibly more

Jeffrey Flory – taken at private property near Two Harbors, MN on 9/21/2015



# Japanese Barberry - continued

## Treatment Efforts

- 1854: cut and treat or basal bark treat with triclopyr

Lake County Invasives Team and SWCD have a large challenge to overcome:

- Initial effort - foliar sprayed with glyphosate
- Fall of 2015 - crews performed three cuts; high, medium, then a low cut
- Debris left on site
- Contractor removed JB and will restore the woodland habitat
- Will continue work (5 - 7 years)
- LCIT and Lake SWCD conducting outreach



# Knotweeds

## Japanese Knotweed – City of Duluth

- The City of Duluth had 17 documented sightings
- 1854 conducted surveys
- In 2015 – found 96 patches
- So far in 2016 - found another 59 patches
- Mainly invades open habitats
- can grow within woodlands  
(though height is stunted)



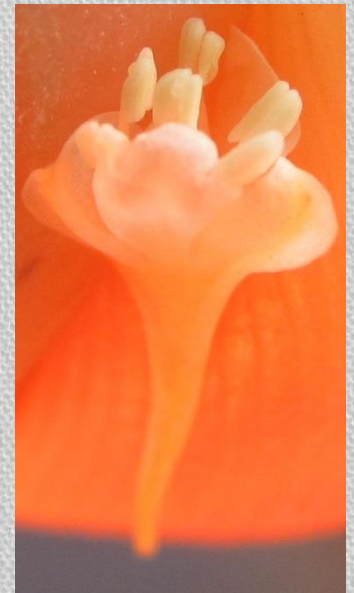
Google Earth – Knotweed patches can be seen by satellite, diameter roughly 50 feet



# Knotweeds - continued

## History

- Theories don't fully explain population numbers
  - Many residences planted Knotweed
  - Flood event in 2012 spread root and stem fragments
  - Bohemian Knotweed (possibly fertile) could explain population
- Minnesota Department of Agriculture conducted survey in 2016
  - Took 40 samples
  - About 7 were Japanese Knotweed
  - Rest are suspected to be Bohemian Knotweed (flowers had anthers)
- Expert will confirm identification
- Seeds might be collected to test for viability



Jeffrey Flory – knotweed anthers, taken in Duluth



# Knotweeds - continued

## Treatment Efforts

- The City of Duluth and their Duluth Invaders and R<sup>2</sup>ED (Rapid Response, Early Detection) Team have been fighting a few patches on public property



Mike Nordin (City of Duluth) – volunteers treating knotweed along Skyline Road



Mike Nordin in this picture, demonstrating the size of the knotweed cane



# Knotweeds - continued

## Treatment Efforts

- They cut the stocks and apply 18 – 20% glyphosate using buckthorn blasters (city policy for their volunteers)



Buckthorn Blaster



Mike Nordin - Treated Knotweed stem



Mike Nordin - Knotweed can re-root where nodes are touching soil



# Knotweeds - continued

## Treatment Efforts

- These efforts have treated patches at varying degrees, some just once, others multiple times (up to 4 – 5 times) and foliar sprayed at the end of the year
- The patches still survive, but are reduced when they resprout



Mike Nordin – volunteers cut and treating knotweed in Duluth

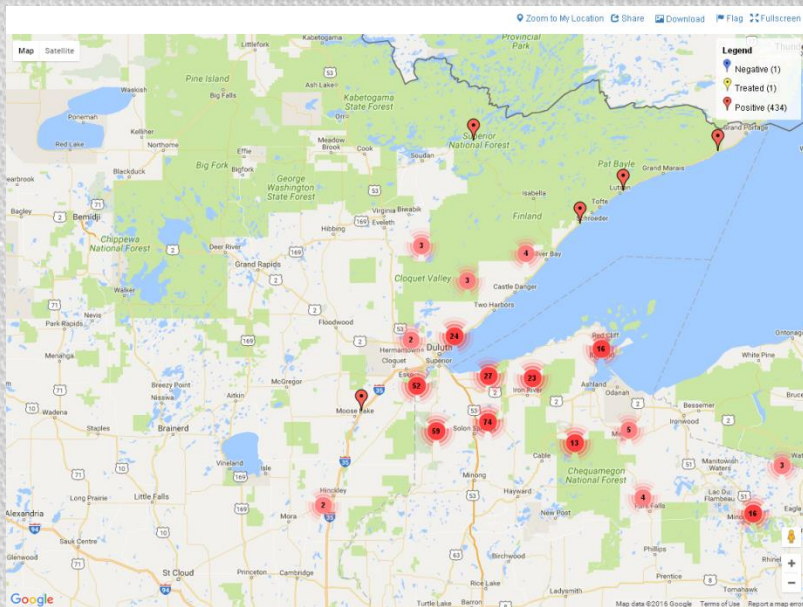


Mike Nordin – volunteers cut and treating knotweed in Duluth



# Garden Valerian

- Duluth appears to be the epicenter in Minnesota
- It has been spreading its fingers along highways
- Lawn mowers and construction are two main vectors
- Others are now finding it in other areas of Minnesota



EDDMapS of Garden Valerian sightings



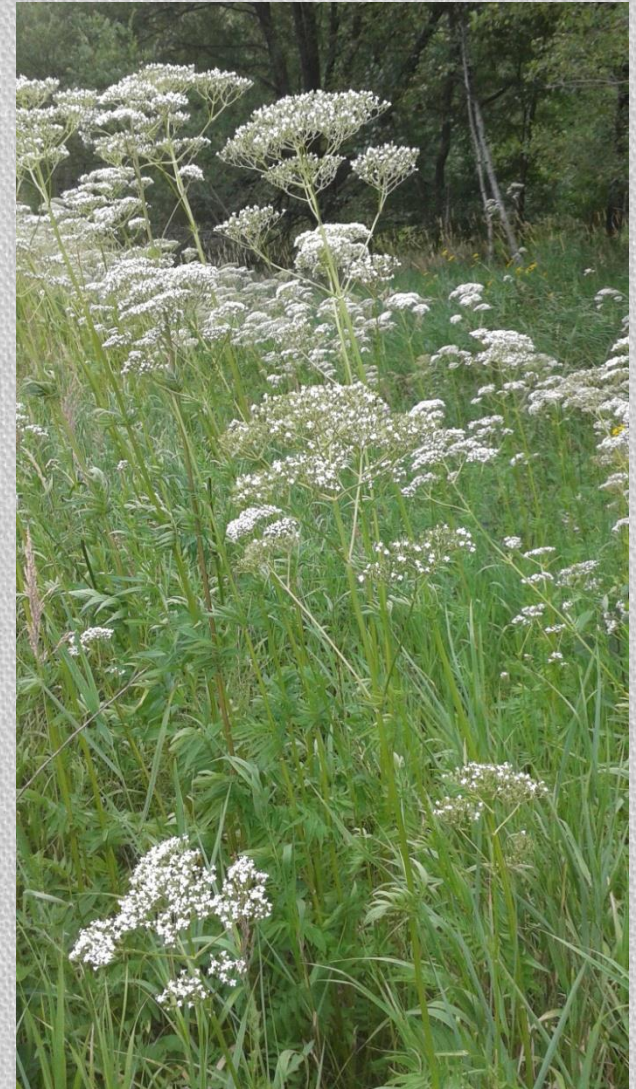
Jeffrey Flory - found growing in Superior National Forest



# Garden Valerian - continued

## Observations:

- Prefers wetlands, but can also grow in:
  - Upland habitats
  - Woodland and forests
    - Stays with basal leaves if too shaded
    - Bolts when canopy opens after storms or declining trees
  - Along roadways and trails
- Competes well against:
  - Reed Canary Grass, Common Tansy, and Invasive Cattails



Jeffrey Flory – dense patch growing along Hwy 53, spreads easily along roadways



# Garden Valerian - continued

## Treatment Efforts

- Not much effort has gone into controlling GV within Duluth
- 1854 has only targeted GV at Moose Mountain SNA (Scientific Natural Area)
- Milestone and Escort did not faze it
- Internet research results
  - WI DNR recommends triclopyr and glyphosate
- Two successful treatments occurred at Moose Mountain SNA with triclopyr



- USFS has successfully treated the two of the known patches in Superior National Forest

Jeffrey Flory – Thick stand of Garden Valerian along Highway 61 on July 31<sup>st</sup>, 2015



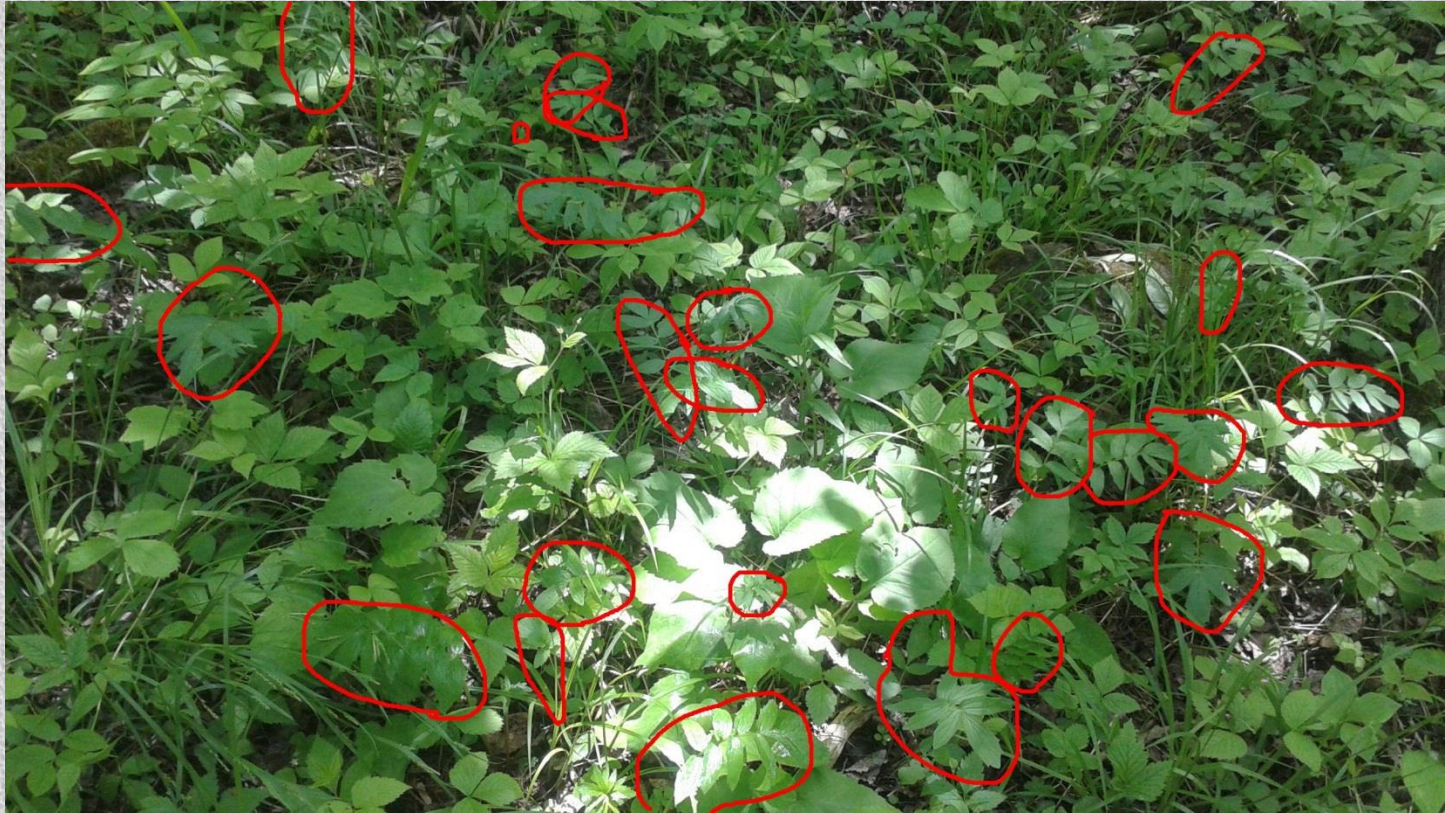
Infestation in a Woodland: How many Garden Valerian individuals do you think are in this picture?



Jeffrey Flory – June 7<sup>th</sup>, 2016 at Moose Mountain SNA



## Garden Valerian Infestation in a Woodland:



There are 25 individual Garden Valerians within this picture



# Oriental Bittersweet

- Thought to be too far north for it to survive our cold winters
- MN DOT found a large patch within Duluth in 2015
- Another two patches found nearby in 2016
- City employee found it on their friend's property
  - In the process of having it treated and area scouted
- Found growing on a building nearby Tower, MN
  - Treated – scouting will occur this winter



Jeffrey Flory – Oriental Bittersweet individuals, near Tower, treated on August 9<sup>th</sup>, 2016



A stylized, dark brown illustration of a plant with several large, oval leaves and a cluster of small, round fruits or berries on thin stems, positioned on the left side of the slide.

Discussions

# EMERGING INVASIVE PLANTS IN YOUR AREA OF THE STATE