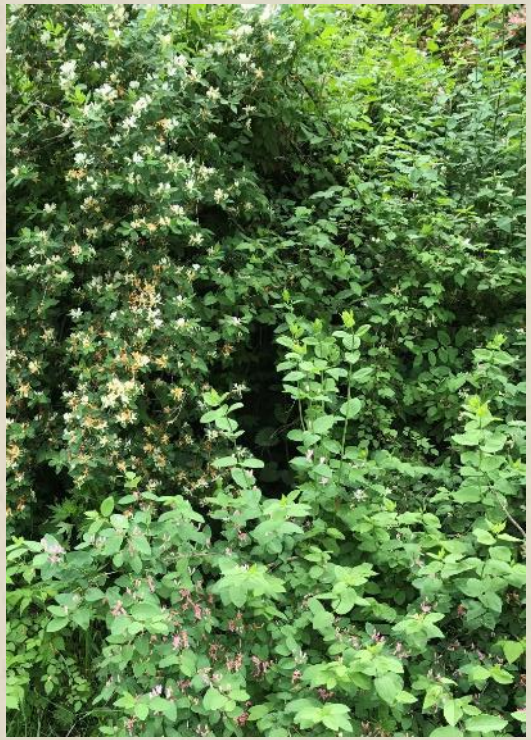
DEVELOPING PLANS TO MANAGE INVASIVE PLANTS ON YOUR LAND



THE UNIVERSITY of WISCONSIN MADISON

MARK RENZ UNIVERSITY OF WISCONSIN-MADISON

EXTENSION WEED SPECIALIST

UW Extension

WHAT ARE YOUR GOAL FOR YOUR WOODS?

Survey of private woodland owners in Kickapoo valley

Answers that averaged to **be important-very important**….

CONNECTION WITH LAND

- Being close to nature
- Solitude
- Privacy
- Retreat from everyday life

PERSONAL USE of LAND

- Recreation
- Personal use of forest products

HOW MANY DIFFERENT INVASIVE PLANTS ARE ON YOUR PROPERTY?

1. < 5 species
2. 6-10 species
3. > 10 species
4. I don't know

WHICH INVASIVE PLANTS IMPACT YOUR GOALS?

Difficult to answer as impacts of invasive species are

- Species specific
- Location specific
- Density specific

WE DON'T KNOW A LOT ABOUT THE IMPACTS OF SOME SPECIES……

JAPANESE HEDGEPARSLEY

DAME'S ROCKET

WHICH INVASIVE PLANTS IMPACT YOUR GOALS?

Ones I would 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

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

STEP 1: PLANT IDENTIFICATION

- Management techniques are usually **species specific**

Black locust

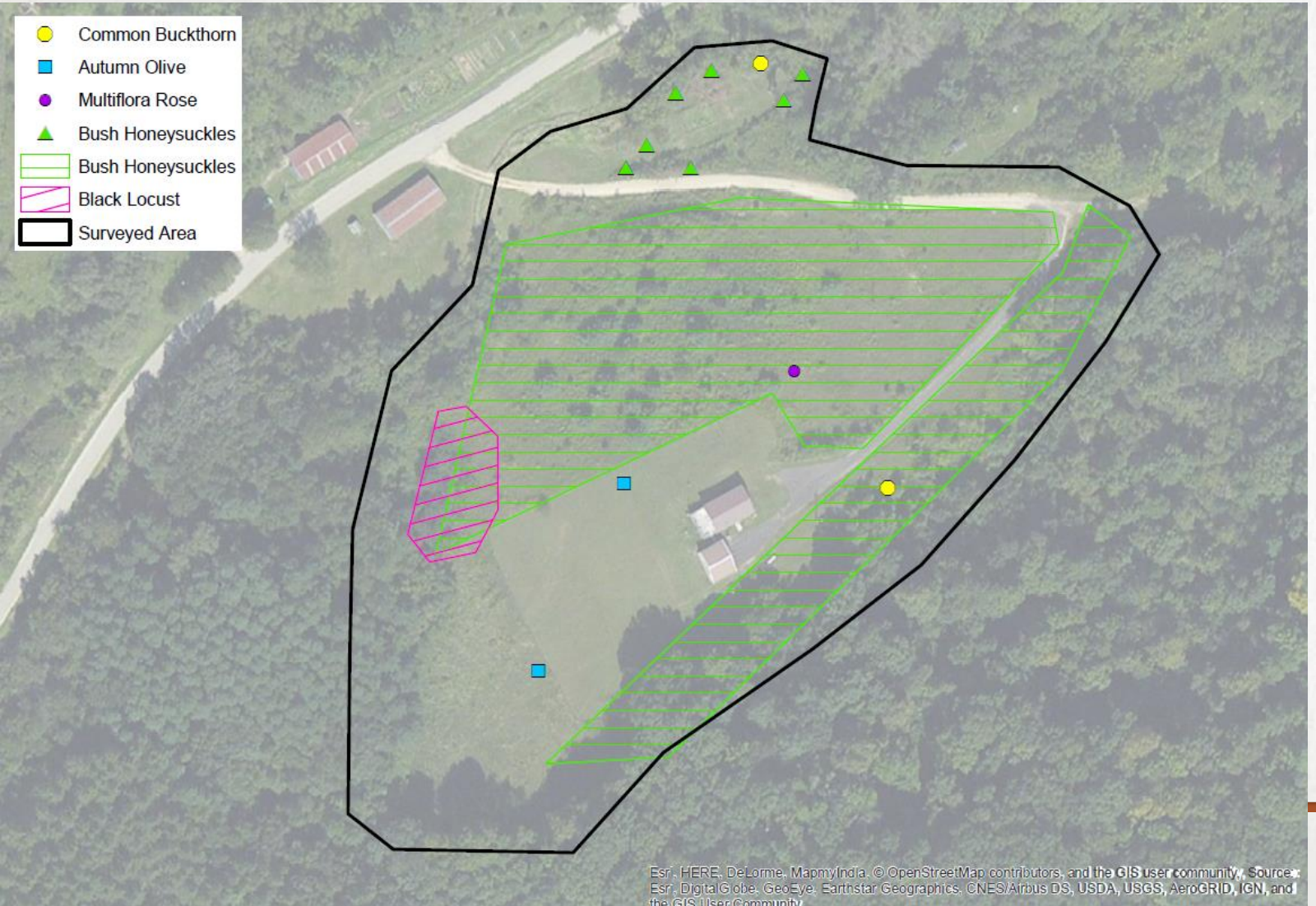
Callery pear

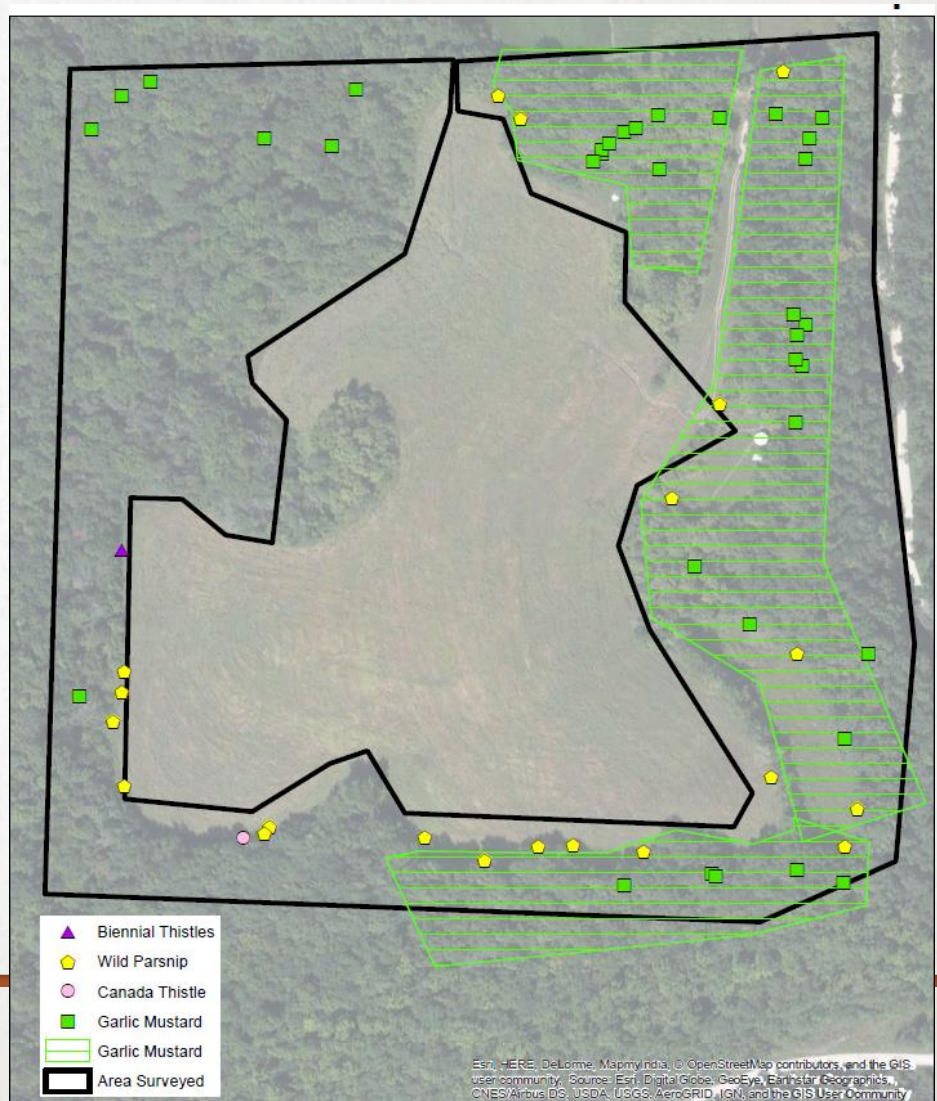
STEP 2: DISTRIBUTION OF POPULATION

Critical for selection of management techniques

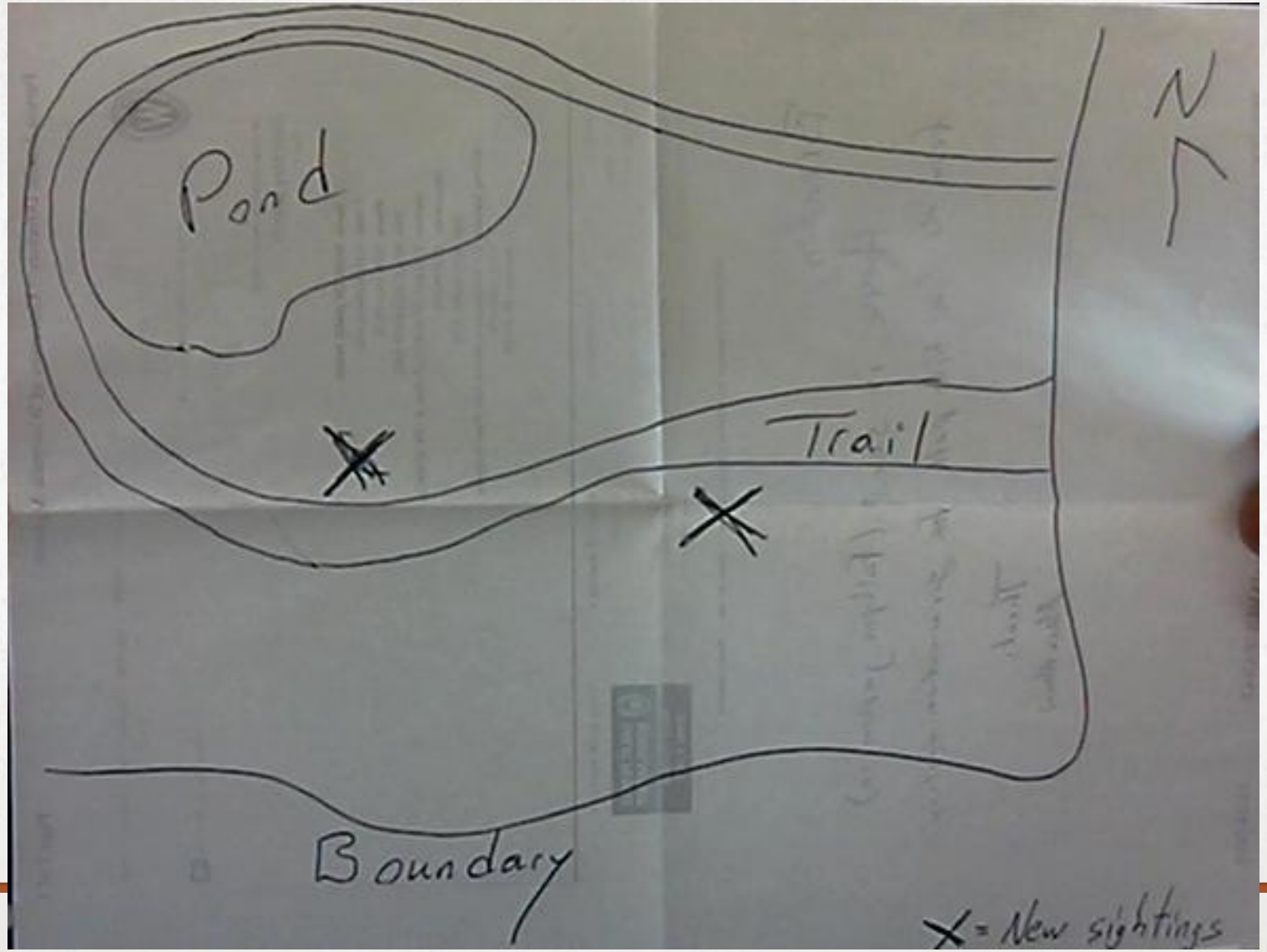
- Where is it on your property
- Where did it come from?

DEVELOPING A MAP IS CRITICAL!



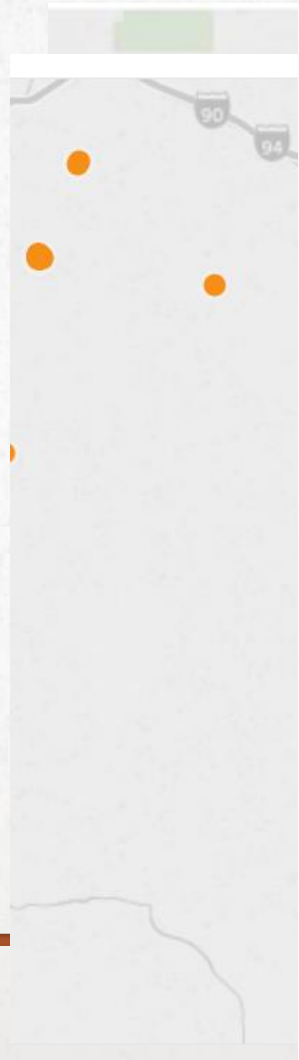


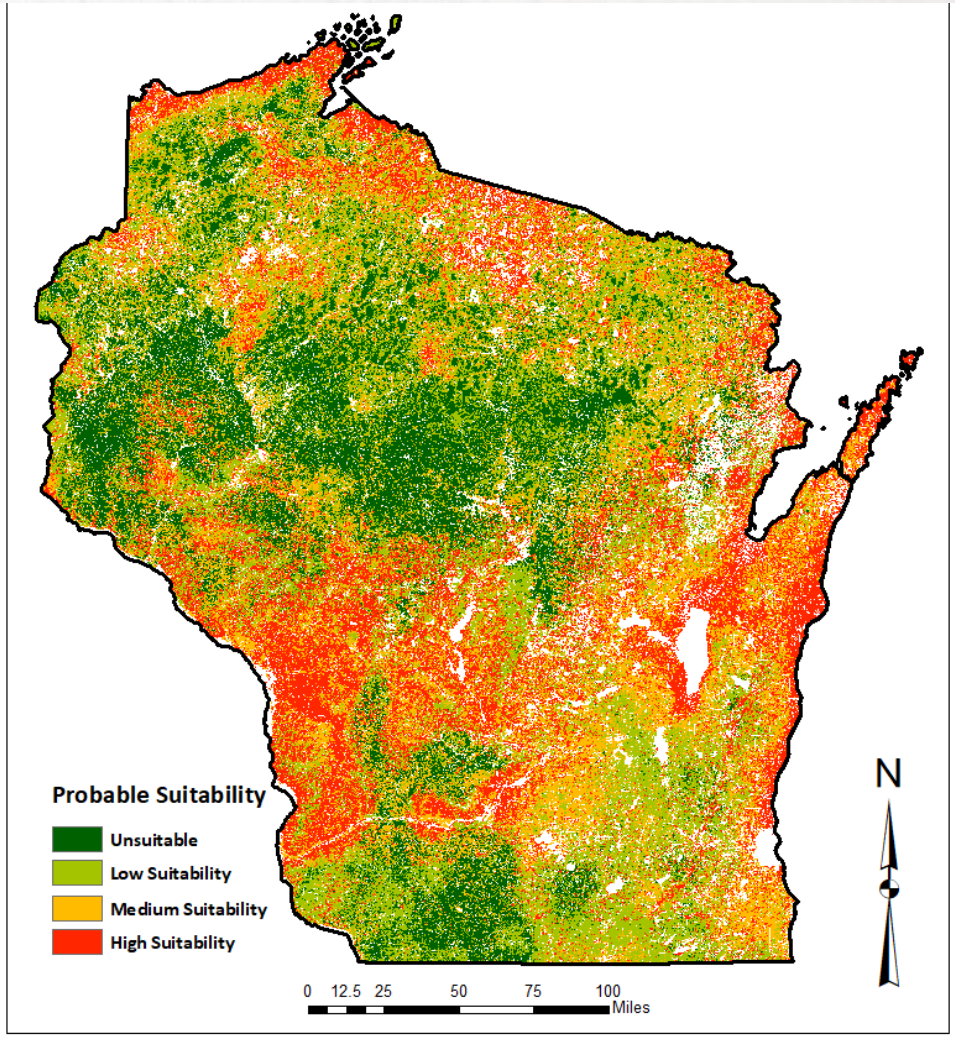
IT DOESN'T NEED TO BE HIGH TECH!



TRY TO LEARN ABOUT OTHER INVASIVES NEARBY WITH POTENTIAL TO ARRIVE AND IMPACT LANDS

- We have developed tools that display currently known distribution of invasive plants in WI
  - WISTIPP viewer
  - https://fyi.uwex.edu/wifdn/wistipp-viewer/
- Developed predictive models to predict suitable habitat





USE THIS INFORMATION TO PRIORITIZE CONTROL

Before you begin think about

1. Where are high priority plants growing?
   - What control methods are an option here?
2. Level of effectiveness that is acceptable and
3. Timeframe that is needed to obtain the desired result
4. Resources required
   - Personal time, $$$$, equipment

THIS IS DIFFICULT! CONSULT EXPERTS FOR HELP!

Mgmt. priority	Species	Number of points	Number of polygons	Approx. area impacted (acres)	Abundance
High	Autumn olive (*Elaeagnus umbellata*)	1	0	-	Few individual plants
High	Biennial thistle (*Cirsium sp./ Carduus sp.*)	3	0	0.2	Scattered plants
High	Canada thistle (*Cirsium arvense*)	3	0	-	Scattered plants
Medium	Reed canary grass (*Phalaris arundinacea*)	4	0	1.5	Scattered dense patches
Medium	Purple crown vetch (*Securigera varia*)	5	1	0.5	Scattered dense patches
Lower	Bush honeysuckles (*Lonicera sp.*)	20	0	2.8	Scattered plants
Lower	Japanese barberry (*Berberis thunbergii*)	1	12	3.5	Scattered plants
Monitor	Multiflora rose (*Rosa multiflora*)	-	-	-	Absent, but present nearby
Monitor	European buckthorn (*Rhamnus cathartica*)	-	-	-	Absent, but present nearby

STEP 3: SELECT APPROPRIATE CONTROL TACTIC

- Evaluate options based on info from Step 1 and 2

- Search **trusted sources** for control recommendations
  - Look for this information:
    - Detailed instructions on how to implement
    - Estimate of how effective it is and for how long
    - Cost to do yourself or hire someone to do
    - Does using this method impact desired plant species

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 with a herbicide
  - Foliar, Basal bark, Cut stump/surface

FACTSHEETS ON

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Brandon Panke and Mark Renz

A3924-11

Japanese knotweed

(Polygonum cuspidatum)

Invasive plants can thrive and aggressively spread beyond their natural range, disrupting ecosystems. The *Management of Invasive Plants in Wisconsin* series explains how to identify invasive plants and provides common management options. Management methods recommend specific timings for treatment, as well as expected effectiveness. For more information, go to: fyi.uwex.edu/weedsci/category/invasive-plants-of-wisconsin.

Japanese knotweed is an herbaceous perennial, growing up to 10' tall. Hollow, reddish, arching, bamboo-like stems are smooth and stout, and they can persist after plant dies back each year. The base of the stem above each joint is swollen and surrounded by a membranous sheath (ocrea).

Legal classification in Wisconsin: Restricted

Leaves: Alternate, egg-shaped to almost triangular, 4–6" long, 3–4" wide. Dark green on upper surface and pale green on lower surface.

Flowers: Bloom in late summer. Flowers are numerous, highly branched, tiny, creamy white or greenish, and found where the leaf attaches to the stem (axils), near the tips of stems.

Fruits and seeds: Small, winged, triangular fruits carry very small, shiny seeds.

Roots: Plants arising from seed have a taproot up to 6' deep. Stout rhizomes can reach 65' or more from parent plants and give rise to new stalks. Plants arising from seed and rhizome also have fibrous roots.

Similar species: Giant knotweed (*P. sachalinense*) is also invasive, but grows up to 13' tall with larger leaves. The two species are known to hybridize.

Ecological threat:

- Invades upland and lowland sites that are disturbed and undisturbed.
- Poses a significant threat to riparian areas, where it can rapidly spread.
- It tolerates shade, high temperatures, high salinity, and drought.
- It can be transported to new sites as a contaminant in fill dirt or on equipment. During floods, it spreads downstream by shoot fragments, rhizomes, or occasionally by seeds. Escapes from neglected gardens and discarded cuttings are common routes of dispersal from urban areas.
- Although reported to not produce viable seed, several studies have shown that populations of knotweed in the United States can produce viable seed that readily germinate and survive in field conditions.

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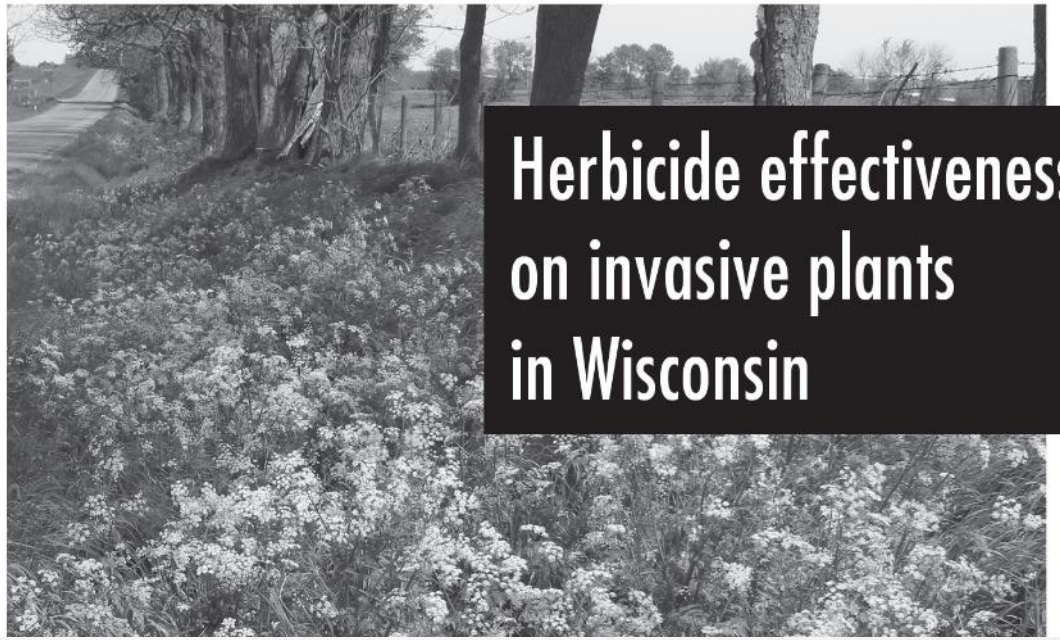

Herbicide effectiveness on invasive plants in Wisconsin

Herbicide effectiveness on invasive plants in Wisconsin (A3893)

Commercial name	Common name (active ingredient)	Burdock	Canada goldenrod	Chinese lespedeza	Common tansy	Crown vetch	Curly dock	Dames rocket	Field bindweed	Garlic mustard	Giant hogweed	Giant ragweed	Hawkweeds	Hill mustard	Japanese hedge parsley	Japanese knotweed	Knapweed spp.
Banvel	dicamba	G	F/G	P	G	G	F/G	G	F/G	F	P/F	F/G	F/G	—	—	F/G	F/G
Butyrac	2,4-DB	—	F/G	—	—	—	F	N	N	—	—	—	—	—	—	—	—
Chaparral	aminopyralid + metsulfuron	G/E	G/E	F/G	G/E	G/E	G/E	G	—	G/E	G	G	G/E	G	G	G/E	E
Cimarron Max	metsulfuron + 2,4-D + dicamba	G/E	G/E	G	G	G	G/E	—	F/G	—	—	F	—	G/E	—	—	F/G
Cimarron Plus	metsulfuron + chlorsulfuron	G/E	G/E	—	E	G	—	—	—	—	—	—	—	—	—	—	—
Crossbow	2,4-D + triclopyr	G/E	F/G	G	F/G	G	G/E	—	F/G	—	—	G/E	—	G	—	—	F/G
Curtail	2,4-D + clopyralid	G	F	—	G	G	F	—	—	—	—	G	F/G	—	—	—	G
Escort	metsulfuron	G/E	G/E	F/G	G	G	G/E	G	P/F	G/E	G	P	—	E	E	—	F
Forefront	2,4-D + aminopyralid	G/E	F/G	P	F/G	E	G/E	—	—	—	—	E	E	—	—	—	E
Fusilade	fluazifop	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Garlon	triclopyr	G/E	F/G	G/E	P	G/E	F/G	G	F	G	G	G/E	—	G	G	F/G	P/F

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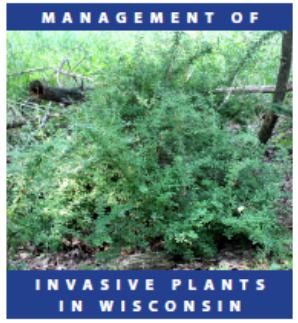
DETAILED CONTROL INFORMATION



A3924-34

Brendon Panke and Mark Renz

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Japanese barberry
(Berberis thunbergii)

Japanese barberry is a round, dense, spiny shrub, typically 2–3' tall, though it may grow up to 6' tall and 6' wide. The branches are reddish brown and deeply grooved with a single, sharp spine at each node. The wood beneath the bark is yellow. It spreads vegetatively through branches that root freely when they touch the ground.

Legal classification in Wisconsin: All wild plants are restricted. Select varieties/hybrids are also restricted. Consult Wisconsin's invasive species rule (NR 40) for details.

Leaves: Alternate, 0.5–1.5" long, entire, and shaped liked a spatula with a narrow base and wide end (spatulate). Color varies depending on the cultivar, but includes green, bluish-green, or dark reddish-purple. Leaves are arranged in clusters above a spine.

Flowers: Mid-spring. Yellow, umbrella-shaped, 0.25" across with 6 petals. Flowers are found along the stem individually or in clusters of 2–4.

Fruits and seeds: Bright-red, oblong berries, 0.3" long. Fruit are found on narrow stalks along the stem individually or in clusters of 2–4. Fruit mature in mid-summer and can persist on shrub into winter.

Roots: Shallow root system. When scratched, the inner layer of the root is yellow.

Similar species: European barberry (*Berberis vulgaris*) is another introduced species that is sometimes invasive. European barberry spines occur in sets of 3, while Japanese barberry spines occur singly.

Ecological threat:

- Invades open and closed canopy forests, woodlands, oak savannas, wetlands, pasture, and meadows. Grows more vigorously on well-drained soils.
- Seeds are readily dispersed by birds.
- Sites infested with Japanese barberry have significantly more deer ticks (*Ixodes scapularis*) than sites where Japanese barberry control efforts have taken place or where barberry is not present.

Non-chemical control

Removal

Effectiveness in season: 90–100%
Season after treatment: 70–90%

Pulling or digging up small- to medium-sized barberry any time of the year is an effective individual plant control strategy if soil conditions are amenable. Remove the root crown, as Japanese barberry resprouts from that area. Small bushes can be pulled by hand and larger bushes can be pulled using a leverage tool. Digging up soil surrounding larger bushes can facilitate plant removal. If fruiting, avoid movement unless material can be transported without spreading fruit to other locations.

Detailed info on

1. Identification
2. Methods
3. Effectiveness
4. Warnings

Mowing

Effectiveness in season: 50–70%
Season after treatment: < 50%

Mow or cut when flowering but prior to fruit production. Mow or cut plants as close to the ground as possible. Mowing or cutting will need to be repeated for a number of years to reduce established populations. Mowing resprouting barberry after initial removal of a plant can prevent reestablishment of the resprouting plant.

Prescribed burning

Effectiveness in season: 50–70%
Season after treatment: < 50%

Spring burns can kill germinating seedlings and suppress aboveground growth of established plants, depending on fire intensity. After fire, established plants will quickly resprout and reinvade areas. Cutting barberry in spring, followed by a summer burn is the most effective burning regime. Burns must be repeated annually for 2–5 years to suppress established populations. A hand-held propane torch can be effective for treating seedlings or barberry plants that are less than 4" in diameter.

Chemical control

Foliar

Apply directly to individual plants or broadcast across an infested area. Broadcasted foliar applications are typically the most cost-effective treatment in dense infestations. Use lower rates on smaller plants and less dense populations and higher rates on larger plants and denser populations. Absorption of herbicide can be limited with this species, resulting in reduced effectiveness. Including a surfactant at 0.25–0.5% can alleviate any potential reduction. If infestations are mixed with desirable vegetation, applications of herbicide without soil activity in the early spring or late fall can reduce injury to desirable plants, as barberry leafs out earlier and drops leaves later than most desirable vegetation.

dicamba + 2,4-D*

Effectiveness in season: 70–90%
Season after treatment: 70–90%

Common name: Outlaw

Rate:
broadcast: 28–44 fl oz/A (dicamba: 0.2–0.4 lb a.e./A + 2,4-D: 0.3–0.5 lb a.e./A)
spot: 0.8% (dicamba: 0.01 lb a.e./gal + 2,4-D: 0.01 lb a.e./gal)

Timing: Apply when target species is actively growing and fully leafed out. While plant is fruiting is the most effective treatment time.

Caution: Do not apply directly to water or to areas where surface water is present. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Overspray or drift to desirable plants should be avoided, as even minute quantities of the spray may cause severe injury to plants. Rates > 16 oz/A (0.5 lb a.e./A) may cause stunting and discoloration of sensitive grasses, such as smooth brome.

glyphosate*

Effectiveness in season: 70–90%
Season after treatment: 50–70%

Common name: Roundup

Rate:
broadcast: 1.5–3 lb a.e./A
spot: For a 3 lb a.e./gal product. 1–2% (0.03–0.06 lb a.e./gal)

Timing: Apply when target species is actively growing and fully leafed out. While plant is fruiting is the most effective treatment time.

Caution: Use product labeled for aquatic use if potential exists for solution to contact surface waters. Applications can result in bare ground as glyphosate is not selective. Overspray or drift to desirable plants should be avoided, as even minute quantities of the spray may cause severe injury to plants.

metsulfuron*

Effectiveness in season: 70–90%
Season after treatment: 70–90%

Common name: Escort

Rate:
broadcast: 1.0–2.0 oz/A (0.6–1.2 oz a.i./A)
spot: 0.04 oz/gal (0.02 oz a.i./gal)

Timing: Apply when target species is actively growing and fully leafed out.

Caution: Do not apply directly to water or to areas where surface water is present. Remains in the soil for months depending on application rate. Overspray or drift to desirable plants should be avoided as even minute quantities of the spray may cause severe injury to plants.

triclopyr*

Effectiveness in season: 70–90%
Season after treatment: 70–90%

Common name: Element 4

Rate:
broadcast: 16–32 fl oz/A (0.5–1.0 lb a.e./A)
spot: 1–2% (0.04–0.08 lb a.e./gal)

Timing: Apply when target species is actively growing and fully leafed out. While plant is fruiting is the most effective treatment time.

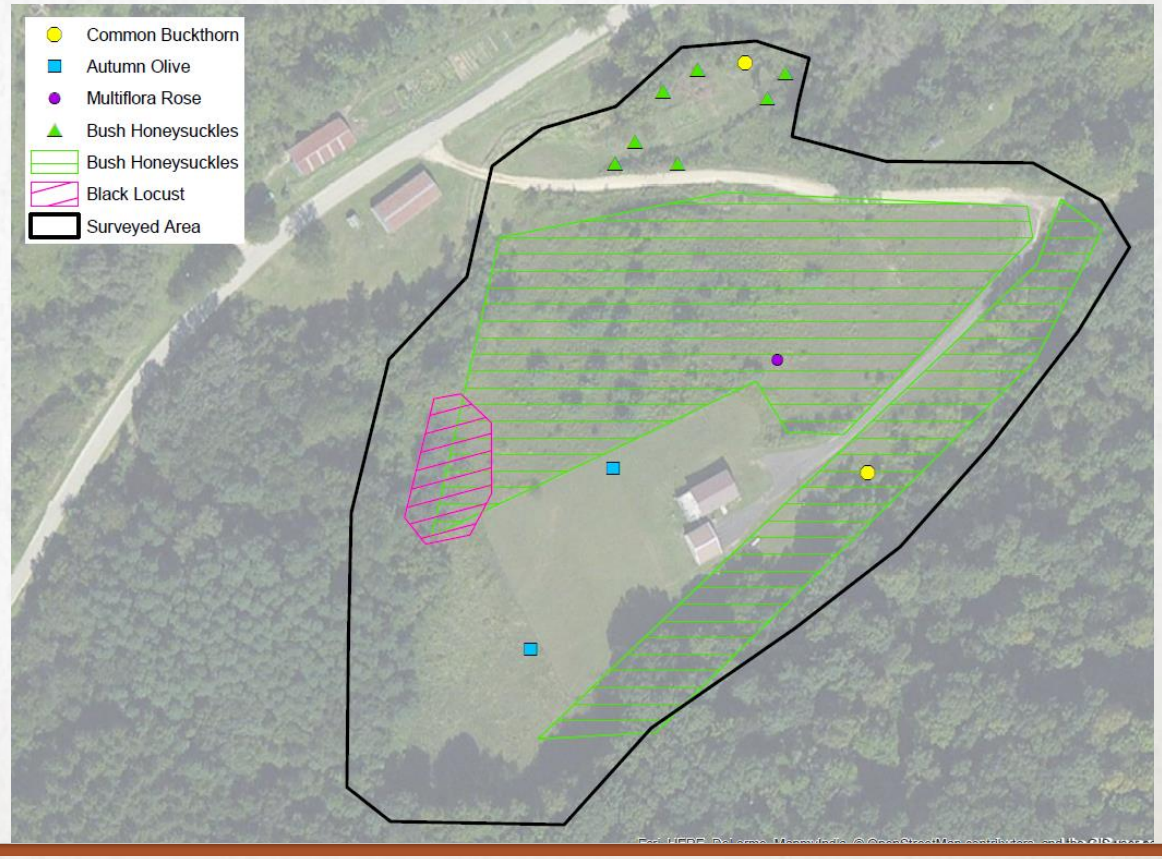
Caution: Use product labeled for aquatic use if potential exists for solution to contact surface waters. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Overspray or drift to desirable plants should be avoided as even minute quantities of the spray may cause severe injury to plants.

STEP 4: APPLY CONTROL METHOD(S)

- Follow the directions provided
  - Pay close attention to details
    - **What timing** is needed to conduct to maximize control?
    - Can I minimize non-target impacts if I apply at a different timing?
    - What restrictions are associated with the method(s)?

STEP 4: APPLY CONTROL METHOD(S)

- What if I have too much to treat in a year?
  - Be strategic
  - Year 1
    - Treat leading new infestations
  - Year 2
    - treat escapes
    - treat further into population



STEP 5: MONITOR AND ADAPT MANAGEMENT

- Periodically assess success
- What to assess
  - Level of control
  - Injury to non-target plants
- Alter management to current conditions to optimize effort/success

AN EXAMPLE


Burning Bush
Japanese Barberry
Common Buckthorn
Multiflora Rose
Bush Honeysuckles
Bush Honeysuckles
Autumn Olive
Autumn Olive
Area Surveyed

High priority

- species with high impact/spread potential
- species that are uncommon

Medium priority

- species with high impact/spread potential
- species that are isolated but present in higher density

Low priority

- Widespread
- Limited impact to woods

Monitor

- species absent but nearby

Mgmt. priority	Species	Number of points	Number of polygons	Approx. area impacted (acres)	Abundance
High	Burning bush (*Euonymus alatus*)	2	0	-	Few individual plants
High	Japanese barberry (*Berberis thunbergii*)	2	0	-	Few individual plants
High	European buckthorn (*Rhamnus cathartica*)	2	0	-	Few individual plants
High	Reed canary grass (*Phalaris arundinacea*)	1	0	-	Few individual plants
Medium	Multiflora rose (*Rosa multiflora*)	19	0	2	Scattered plants Scattered dense patches
Medium	Bush honeysuckles (*Lonicera sp.*)	10	1	7	Scattered plants
Lower	Wild parsnip (*Pastinaca sativa*)	4	1	14.5	Scattered plants
Lower	Canada thistle (*Cirsium arvense*)	0	2	16	Scattered plants Scattered dense patches
Lower	Autumn olive (*Elaeagnus umbellata*)	9	2	20	Scattered plants
Lower	Biennial thistle (*Cirsium sp./ Carduus sp.*)	0	1	22	Scattered plants Scattered dense patches
Monitor	Oriental bittersweet (*Celastrus orbiculatus*)	-	-	-	Absent, but present nearby
Monitor	Garlic mustard (*Alliaria petiolata*)	-	-	-	Absent, but present nearby
Monitor	Purple crown vetch (*Securigera varia*)	-	-	-	Absent, but present nearby

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 swallowwort
- 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

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

THANKS FOR THE TIME AND GOOD LUCK!

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Extension Weed Specialist