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

Invasive Plant Management

Creating and implementing a management plan

2021 Wisconsin Woodland Owner Conference

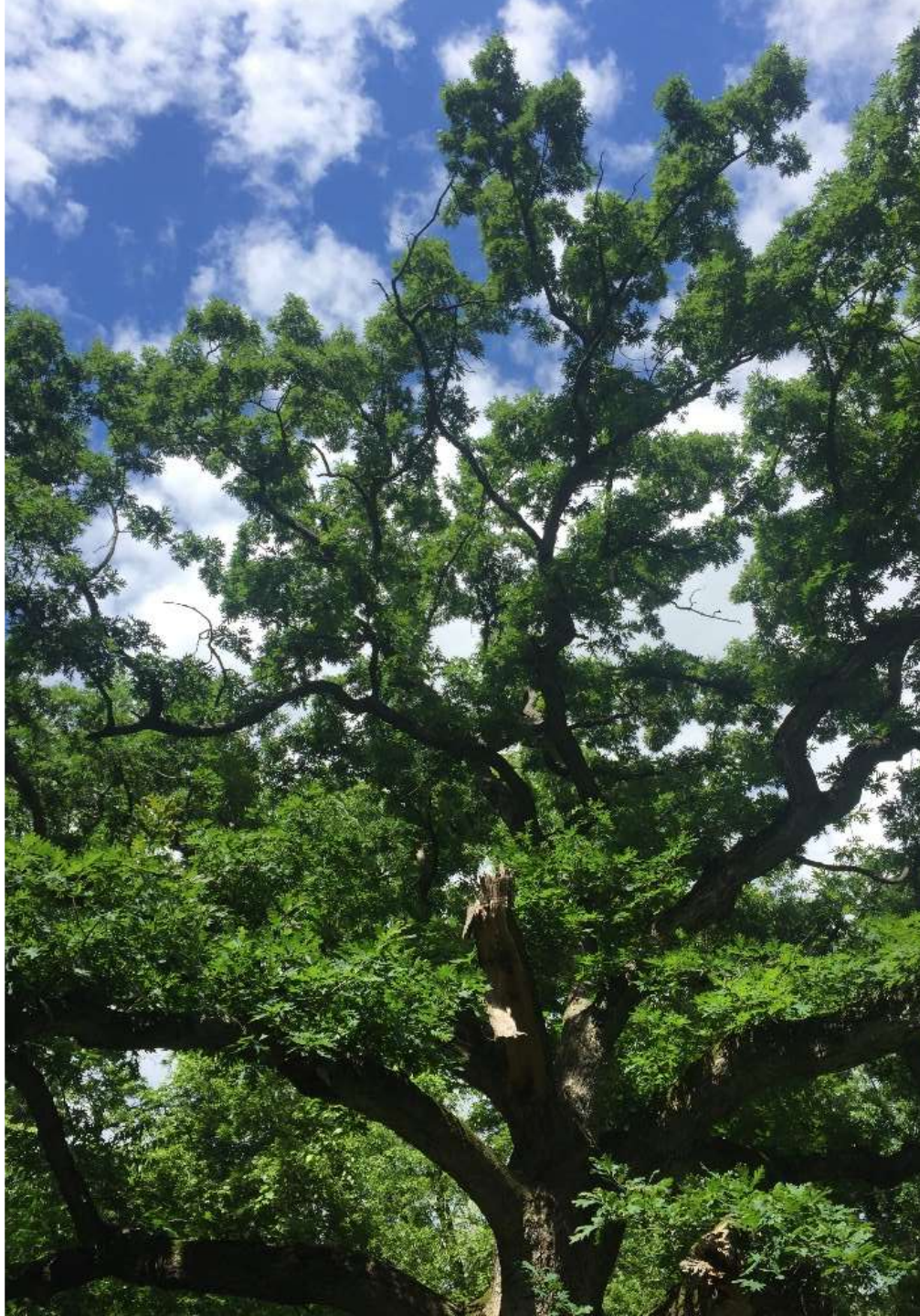
Mark Renz
Extension Weed Specialist
mrenz@wisc.edu

Leo Roth
Research Specialist
nlroth2@wisc.edu

WOODLAND GOALS

Woodland owner survey in Kickapoo Valley

- Being close to nature
- Solitude
- Privacy
- Retreat from everyday life
- Recreation
- Personal use of forest products



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

INVASIVE PLANTS MAY IMPACT THOSE GOALS

Impacts are species-specific

- Reduce tree seedling regeneration – buckthorn and honeysuckle
- tick habitat - Japanese barberry and honeysuckle
- Inhibit native plant germination (allelopathy) – garlic mustard
- Unclear impacts - Japanese hedge parsley, dame's rocket, etc.

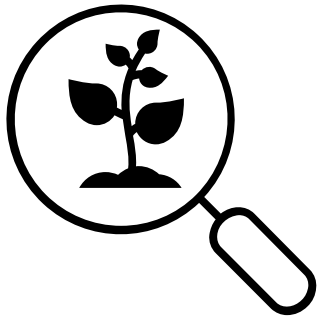
HOW TO PRIORITIZE MANAGEMENT

- It’s difficult!
  - 1 vs 1,000 shrubs
  - What are the impacts on your forest management goals?

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

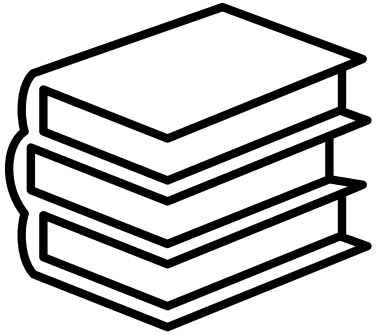
INVASIVE PLANT MANAGEMENT

Five step approach (adaptive management)

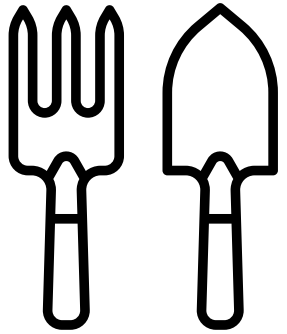


IDENTIFY

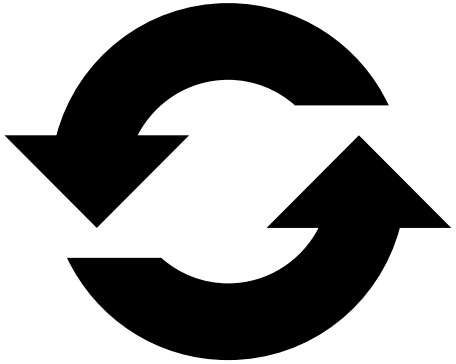
RECORD



RESEARCH

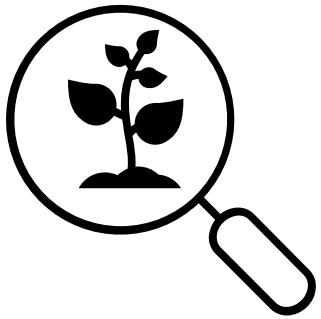


CONTROL



ADAPT

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



PLANT IDENTIFICATION

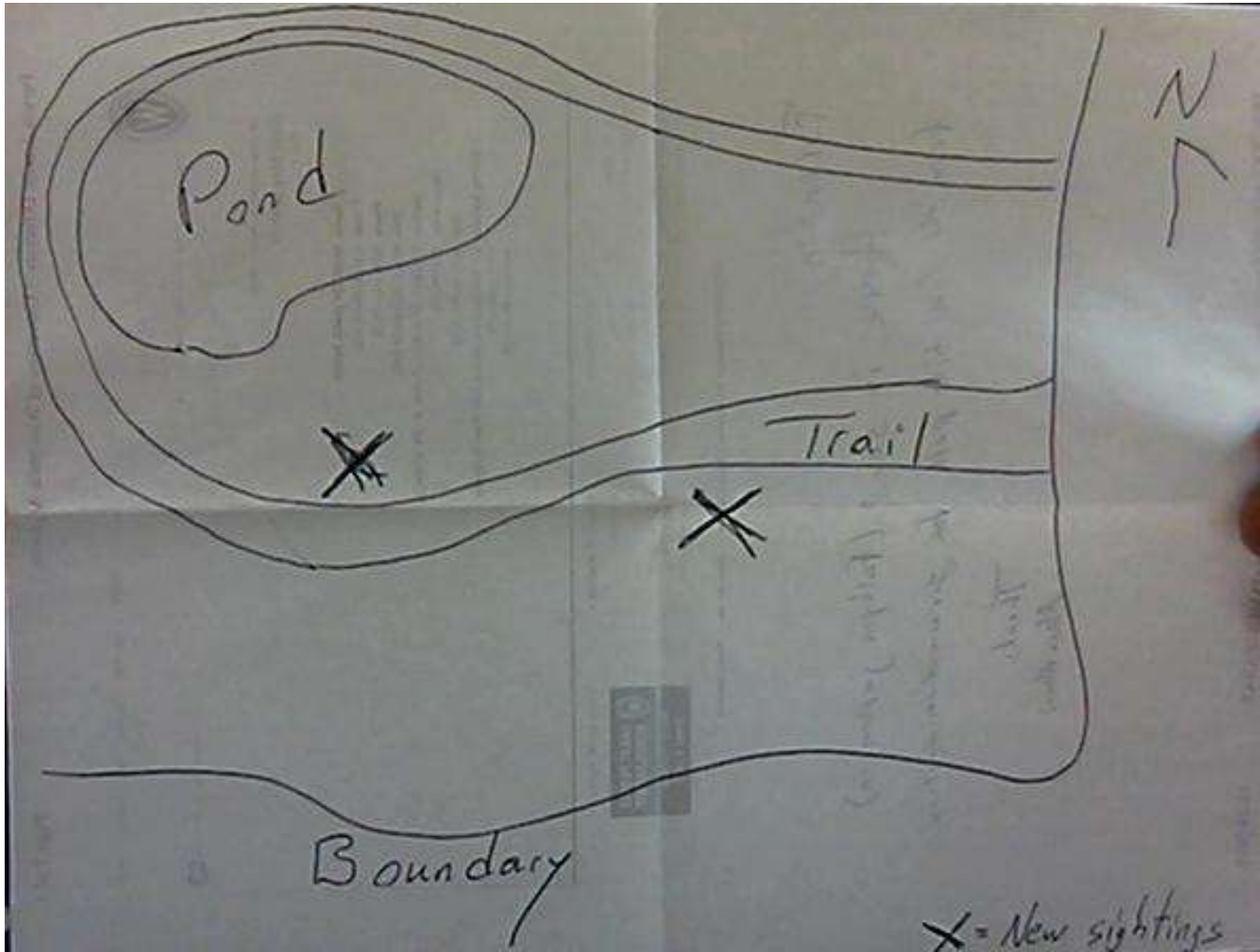
Many resources exist – Management is species specific

Books	Websites	People
Wildflowers of Wisconsin – Emmet & Judziewicz	Renz Weed Science & WI invasive plant ID resource	Renz Lab staff
Weeds of the Northern U.S. and Canada – Royer & Dickinson	Wisflora – UW Herbarium	WDNR staff – local foresters, endangered resources bureau
Weeds of the Northeast – Uva, Neal, DiTomaso	Minnesota Wildflowers	UW Extension county agents
Field Guide to Invasive Plants in Wisconsin – WDNR	Illinois Wildflowers	Local CWMAs & CISMAs
	Missouri Plants	County Land Conservationists

RECORD

Map populations

- Where are the plants?
- Where are they coming from?
- When were they found?

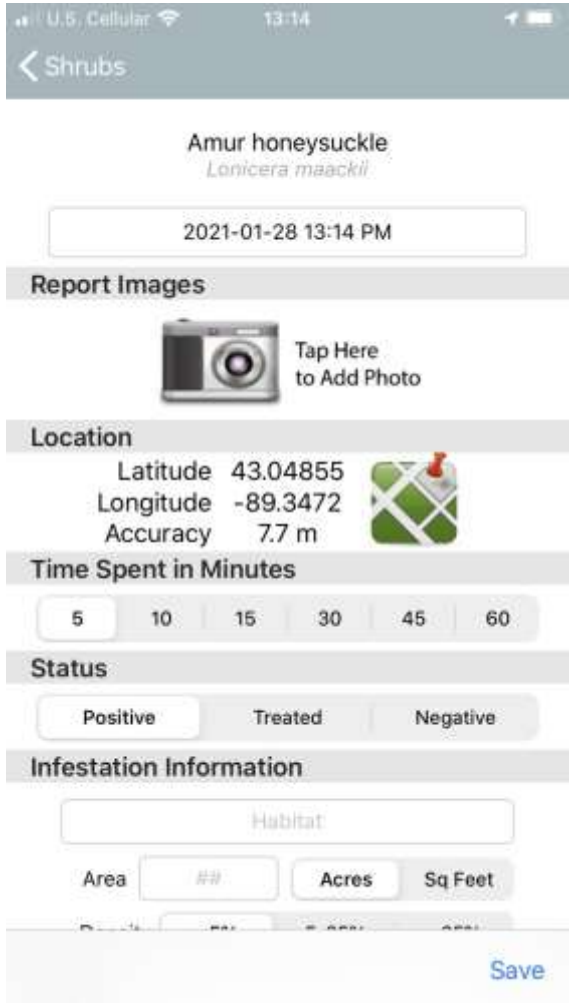


Renz Weed Science
COLLEGE OF AGRICULTURAL & LIFE SCIENCES
UNIVERSITY OF WISCONSIN-MADISON

RECORD

Keep & submit records

- Lots of mapping options
  - Mobile
    - GLEDN
  - Desktop
    - Google Earth, WISTIPP Viewer
    - Pen and paper!
  - Ask us for help if interested



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

RECORD

Maps support management

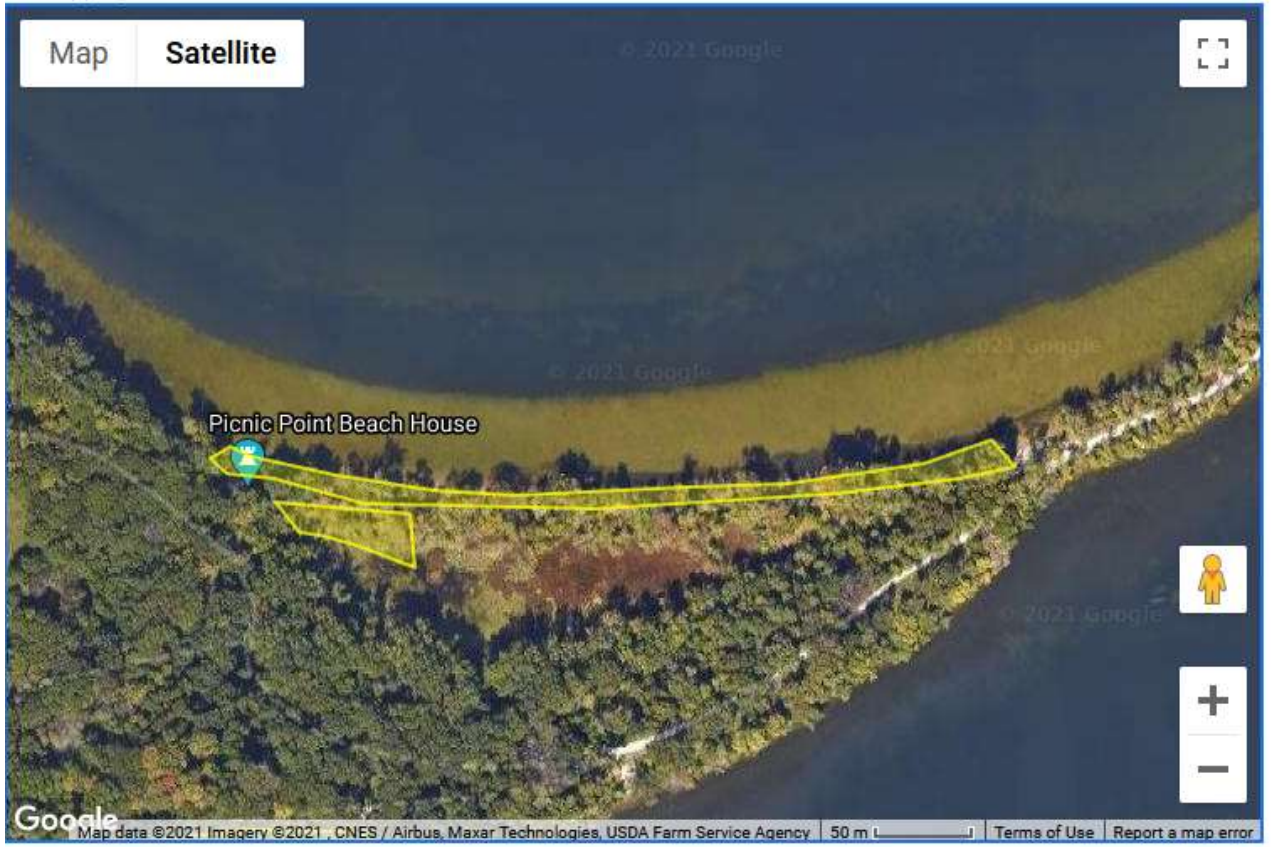
- Maps help locate priority management areas

- Maps help develop a plan
  - How many resources are required (time, people, money)?
  - What does the management need to accomplish?

Type	Brand Name	Total Solution	units	Rate	units	% Solution	Surfactant	Dye	Mix Amount	units
pesticide	AquaNeat	2.583	gal			1	A-90	Blue		

Mappings

No mappings



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

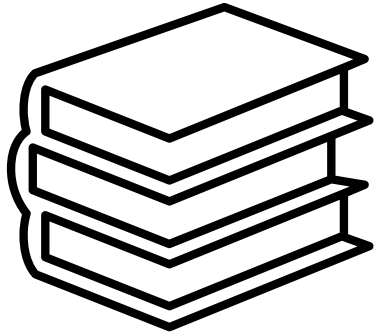
RECORD

Prioritization is tough!

- Consider:
  - Your goals
  - Location
  - Abundance
  - Hazard
- Ask an expert!

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

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



RESEARCH

Gather & evaluate information

- Consider options based on plants identified and mapped
- Lots of management options exist
- **Management is species specific**

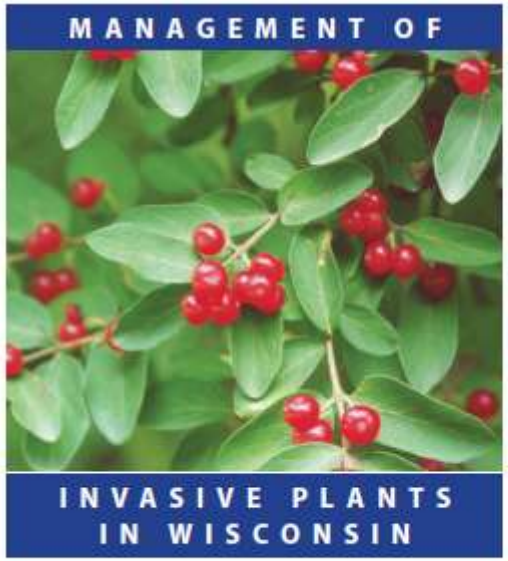
Renz Weed Science
COLLEGE OF AGRICULTURAL & LIFE SCIENCES
UNIVERSITY OF WISCONSIN–MADISON

RESEARCH

Select appropriate management technique(s)

- Use **trusted sources** for recommendations

- Key Details:
  - How to implement
  - Effectiveness
  - Cost (do it yourself or contractor)
  - Special issues
    - Restrictions, impacts to other plants



A3924-03

Bush honeysuckles

(Lonicera spp.)

dicamba*

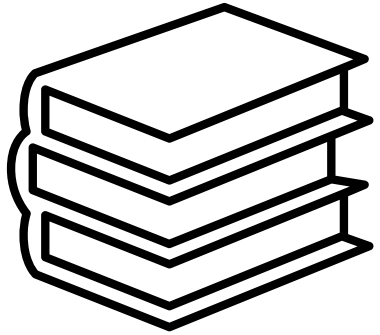
Effectiveness in season: 50–70%
Season after treatment: < 50%

Common name: Banvel

Rate:
broadcast: 16–32 fl oz/A (0.5–1.0 lb a.e./A)
spot: Equivalent to broadcast rates.

Timing: Apply to regrowth following mowing.

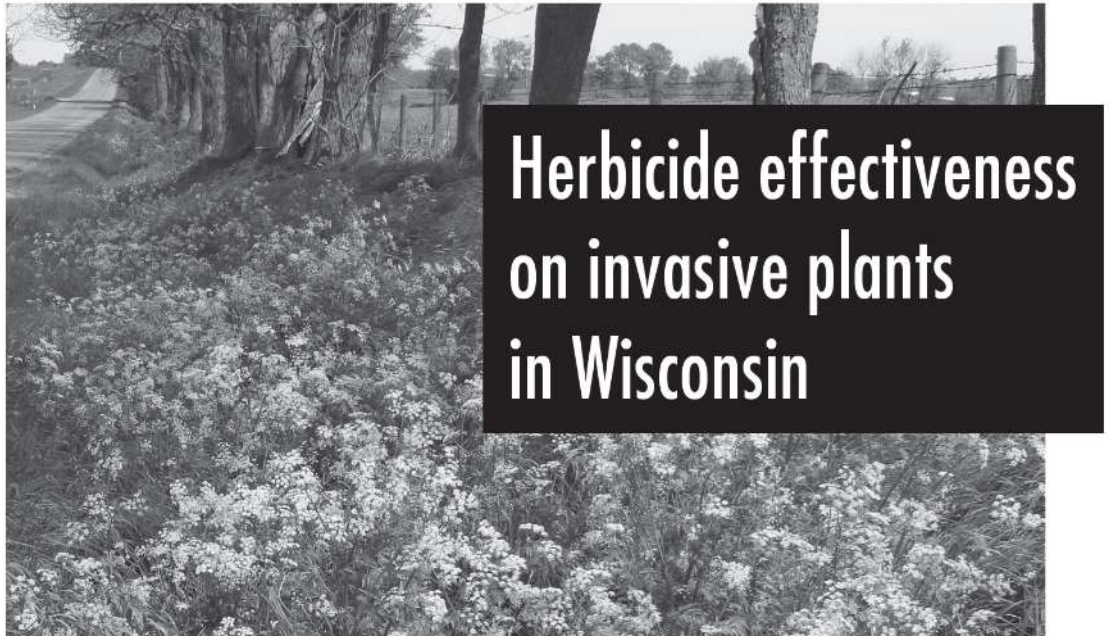
Caution: Do not apply directly to water or to areas where surface water is present. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Overspray or drift to desirable plants should be avoided, since even minute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



RESEARCH

More resources

- RenzWeedScience.cals.wisc.edu has lots of info
  - Invasive plant management factsheets
  - Herbicide effectiveness table
  - Research results
- Ask local experts
- Look for factsheets from neighboring state if you can't find info



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

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

CONTROL

Implement management method(s)

- Follow provided directions!
  - Herbicide labels
  - Factsheets
- Key details
  - Optimal timing
  - Restrictions
  - Off-target injury

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

CONTROL

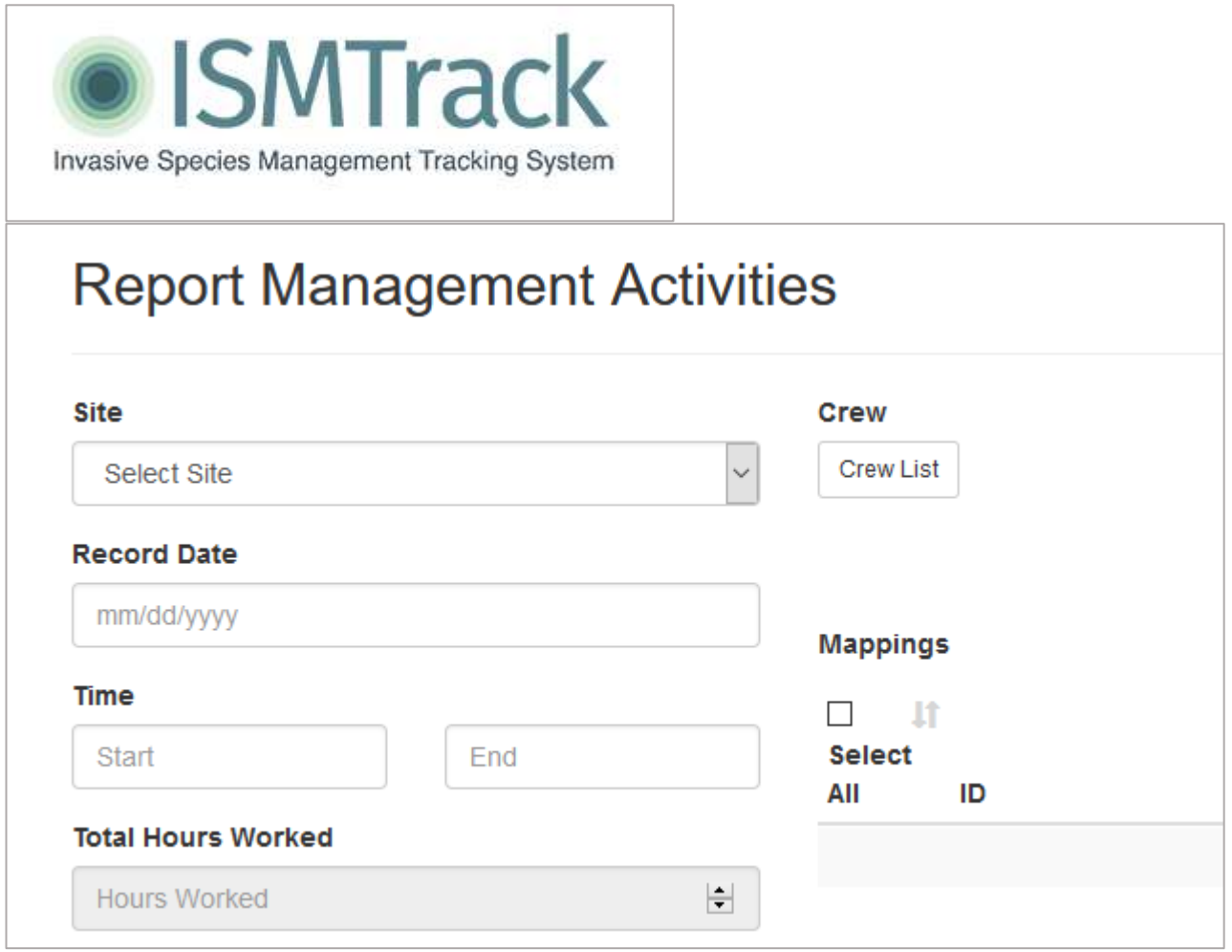
Common woodland management methods

- Something to cut or pull woody plants
  - Chainsaw / weed wrench
- Something to apply herbicide
  - Backpack sprayer / hand sprayer
- Knowledge of herbicide application techniques
  - Foliar
  - Basal bark
  - Cut stump / surface

CONTROL

Monitor progress

- Keep track of methods
  - Locations managed
  - Techniques used
  - Time spent
  - $ used

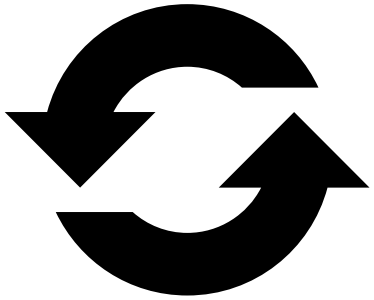


ADAPT

Assess outcomes

- Evaluation metrics:
  - Control of invasive plants
  - Injury to non-target plants

- How to measure success?
  - Photos before & after management

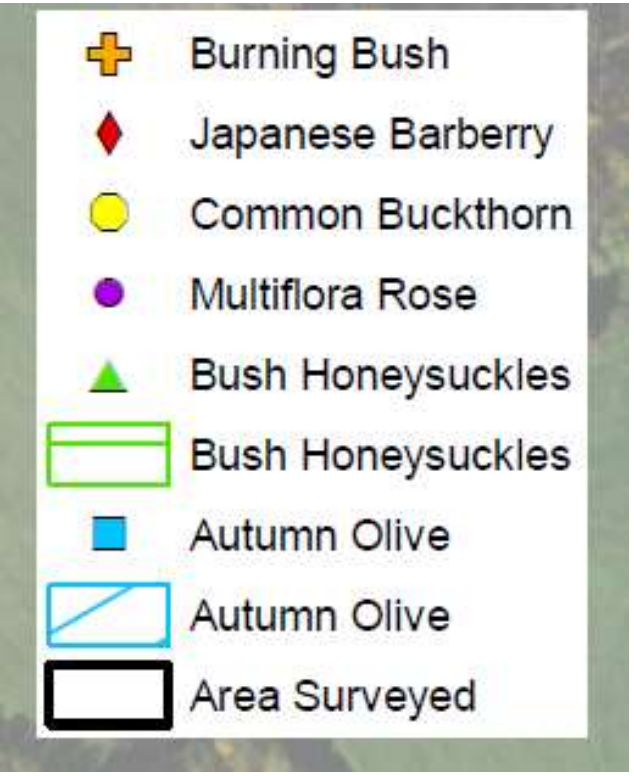


ADAPT

Update management plan with lessons learned

- What worked? What didn't?
- Management is multi-year process
- Don't get discouraged!
  - Set achievable goals based on your priorities

EXAMPLE



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

PRIORITIZATION REVISITED

Priority Factors
Frequency (how expensive to manage)
Impact (harm caused to forest goals)
Source Populations (can I eradicate?)

Priority level	Frequency	Impact	Source Population
High	low	high	can manage
Medium	medium	medium	can manage
Low	high	low/unknown	cannot manage
Monitor	not on my property	high	nearby

RENZ LAB'S LIST of SPECIES to MONITOR & MANAGE

High woodland impact; widespread throughout WI

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

*known to impact human health directly or indirectly

High woodland impact; uncommon in WI

- tree of heaven
- burning bush
- porcelain berry
- common bittersweet
- lesser celandine / fig buttercup
- Amur corktree
- golden creeper
- Japanese stiltgrass

MANAGEMENT PLANNING TIPS

- Incorporate invasive plant management in your forest management plan
- Manage invasive plants based on your personal goals for the land
- Monitor yearly for new species entering your lands
  - If new species found, evaluate the benefit/risk of doing nothing
  - If you can't identify a new plant, ask an expert
  - Find source populations and minimize spread
- Utilize experts and science-based publications
  - People will help, just ask!

QUESTIONS?

Website:
RenzWeedScience.cals.wisc.edu

Mark Renz
Extension Weed Specialist
mrenz@wisc.edu

Leo Roth
Research Specialist
nlroth2@wisc.edu

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