How to Select Landscape Management Treatments in an IPM Framework

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The city of Madison has diverse landscapes with diverse goals

Vegetation is managed to meet these goals

IPM from a weed management perspective

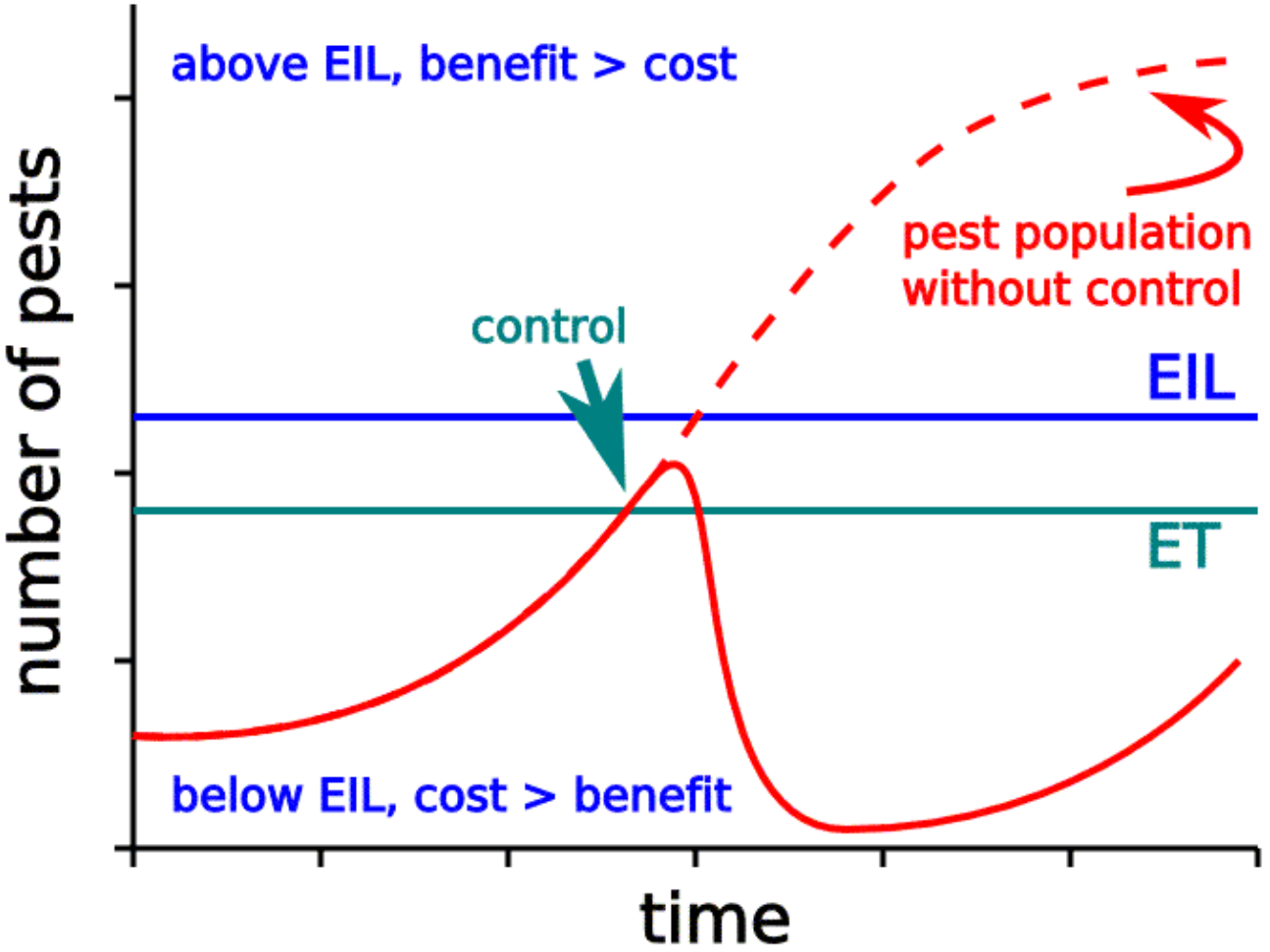
- To implement IPM you need to know
  - The goals of the land (use)
  - understanding of the biology and ecology of the weed species

- With this information can search for and select the most effective, efficient (cost/labor), and environmentally sound methods

How is integrated weed management different

- Threshold concept often not valid (non-agricultural lands)

- Goal often eradication
  - Preserve/improve environmental health
  - Protect human health
  - Obtain the desirable results (cosmetics)
  - Preventing further spread (good neighbor)



How do you select management methods?

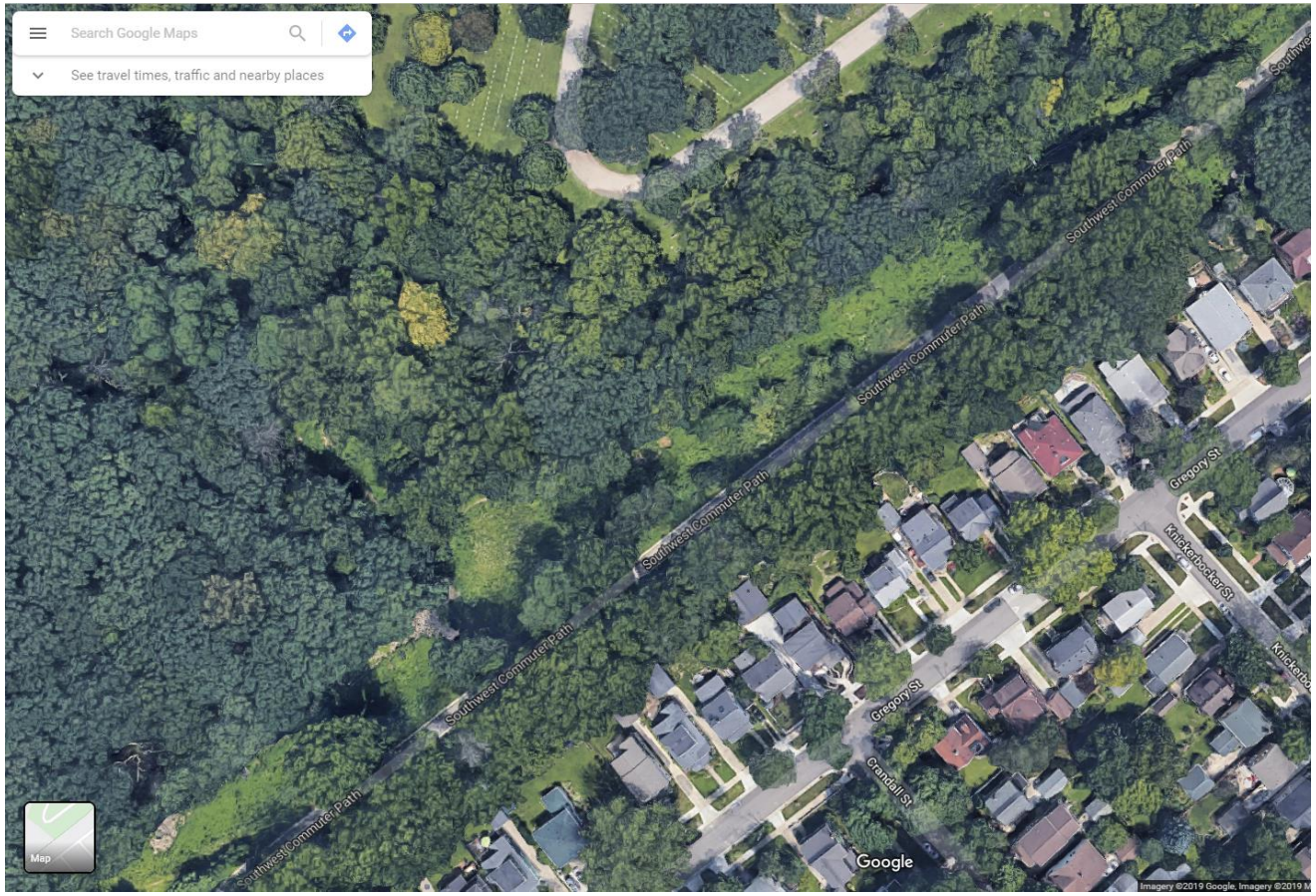
- Need to consider based on stated goals/land management objectives

- Evaluate control techniques that improve stated goals
  - Effectiveness
  - Costs of treatment and repeated treatments
  - Negative consequences from applications

- Who makes the decision?
  - Staff with knowledge of
    - goals/objectives of land in question
    - Control techniques

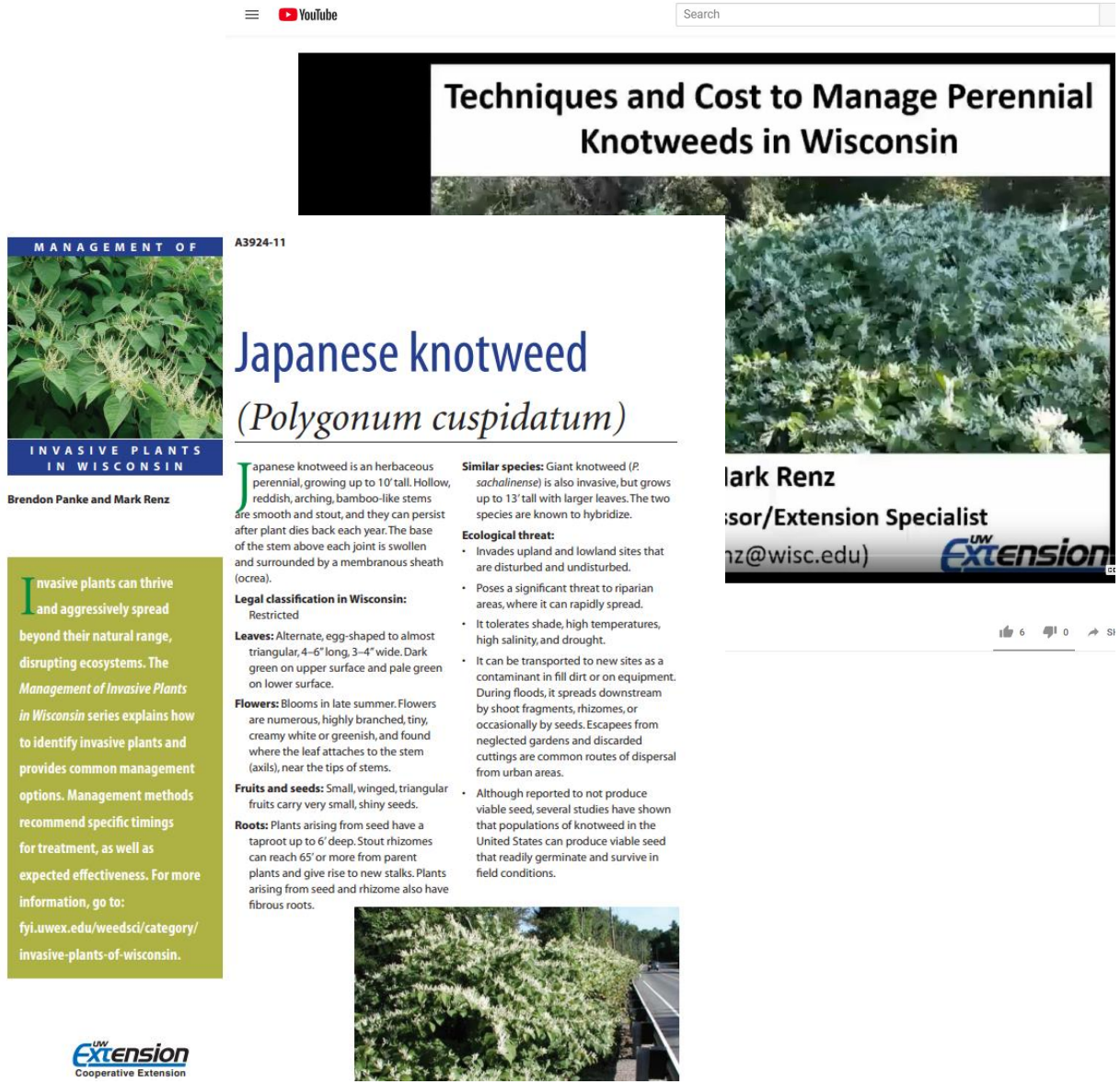
Example #1 Japanese/bohemian knotweed on bike path

- What is the goal of the vegetation surrounding the southwest path?
- How does Japanese knotweed impact these goals?
- Regulations?
- What are management methods available?



Management for bohemian knotweed

- Excavation
  - PRO: effective, allows for restoration
  - CON: high disturbance, cost
- Smothering/plastic mulch
  - PRO: effective, easy to install
  - CON: not realistic on a large scale, mulch must remain for 5 years.
- Herbicides
  - PRO: Effective, cheap relative to other management
  - CON: will need to restore after management

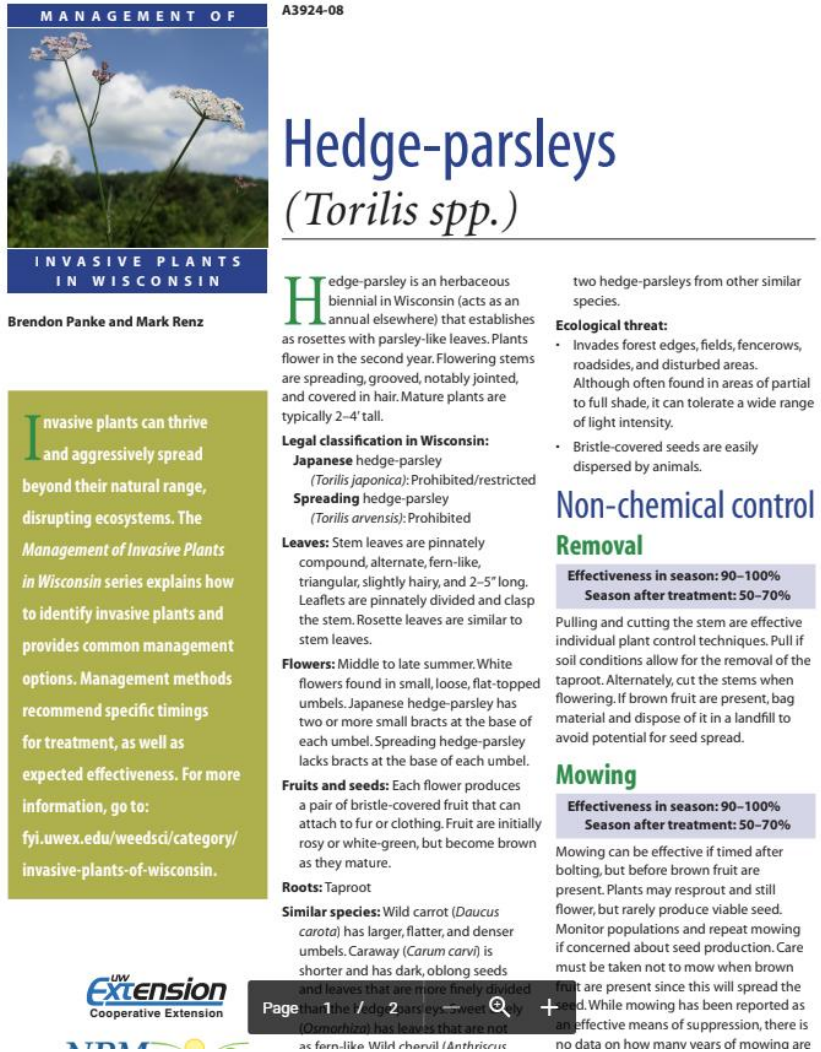


Example #2 Japanese hedge parsley near zoo

- What is the goal of the this area?
- How does Japanese hedgeparsley impact these goals?
- Regulations?
- What are management methods available?

Management for Japanese hedge parsley

- Hand-pulling
  - PRO: effective, minimal damage to desirables
  - CON: time consuming, causes soil disturbance results in future invasions
- Mowing
  - PRO: effective, if timed right
  - CON: may harm other desirables
- Herbicides
  - PRO: Effective, cheap relative to other management
  - CON: may harm forbs/pollinators



MANAGEMENT OF

INVASIVE PLANTS IN WISCONSIN

A3924-08

Brendon Panke and Mark Renz

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.

Hedge-parsleys (*Torilis spp.*)

Hedge-parsley is an herbaceous biennial in Wisconsin (acts as an annual elsewhere) that establishes as rosettes with parsley-like leaves. Plants flower in the second year. Flowering stems are spreading, grooved, notably jointed, and covered in hair. Mature plants are typically 2–4' tall.

Legal classification in Wisconsin:
Japanese hedge-parsley (*Torilis japonica*): Prohibited/restricted
Spreading hedge-parsley (*Torilis arvensis*): Prohibited

Leaves: Stem leaves are pinnately compound, alternate, fern-like, triangular, slightly hairy, and 2–5" long. Leaflets are pinnately divided and clasp the stem. Rosette leaves are similar to stem leaves.

Flowers: Middle to late summer. White flowers found in small, loose, flat-topped umbels. Japanese hedge-parsley has two or more small bracts at the base of each umbel. Spreading hedge-parsley lacks bracts at the base of each umbel.

Fruits and seeds: Each flower produces a pair of bristle-covered fruit that can attach to fur or clothing. Fruit are initially rosy or white-green, but become brown as they mature.

Roots: Taproot

Similar species: Wild carrot (*Daucus carota*) has larger, flatter, and denser umbels. Caraway (*Carum carvi*) is shorter and has dark, oblong seeds and leaves that are more finely divided than the [illegible] (*Osmorhiza*) has leaves that are not as fern-like. Wild chervil (*Anthriscus*

two hedge-parsleys from other similar species.

Ecological threat:
- Invades forest edges, fields, fencerows, roadsides, and disturbed areas. Although often found in areas of partial to full shade, it can tolerate a wide range of light intensity.
- Bristle-covered seeds are easily dispersed by animals.

Non-chemical control

Removal

Effectiveness in season: 90–100%
Season after treatment: 50–70%

Pulling and cutting the stem are effective individual plant control techniques. Pull if soil conditions allow for the removal of the taproot. Alternately, cut the stems when flowering. If brown fruit are present, bag material and dispose of it in a landfill to avoid potential for seed spread.

Mowing

Effectiveness in season: 90–100%
Season after treatment: 50–70%

Mowing can be effective if timed after bolting, but before brown fruit are present. Plants may resprout and still flower, but rarely produce viable seed. Monitor populations and repeat mowing if concerned about seed production. Care must be taken not to mow when brown fruit are present since this will spread the seed. While mowing has been reported as an effective means of suppression, there is no data on how many years of mowing are

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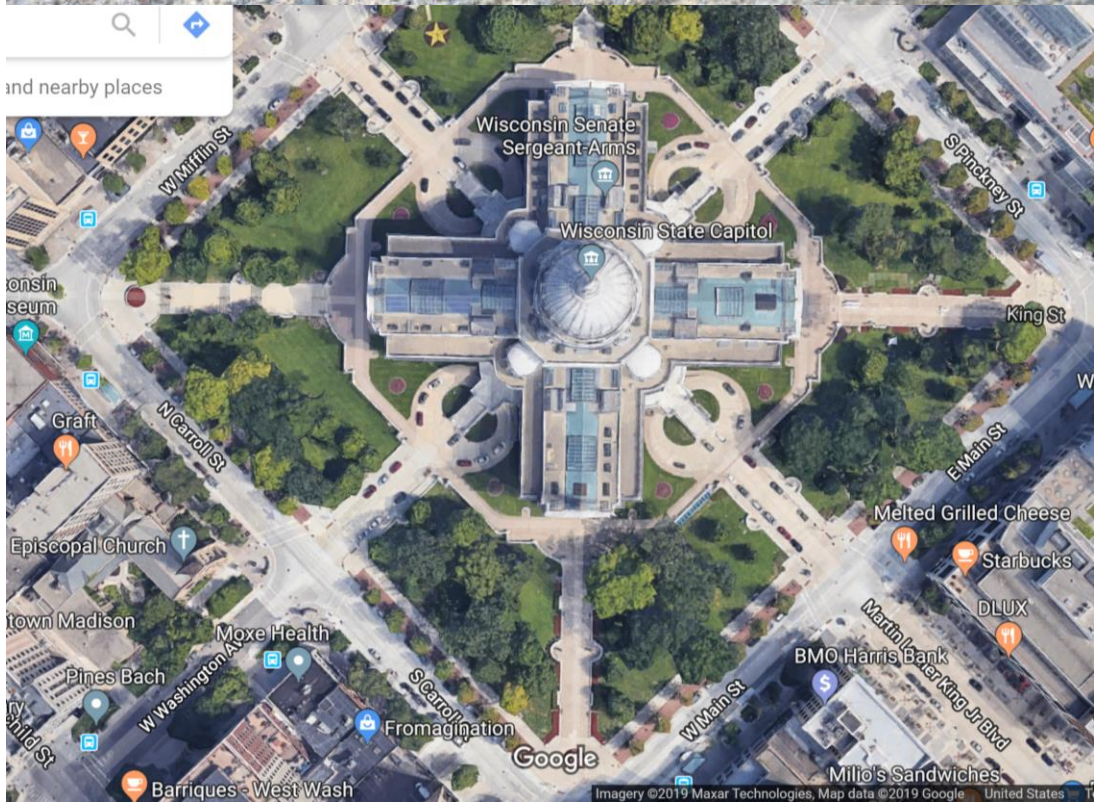
Example #3 common ragweed state capital

- What is the goal of the this area?
- How does common ragweed impact these goals?
- Regulations?
- What are management methods available?



Management of Common ragweed and other annuals

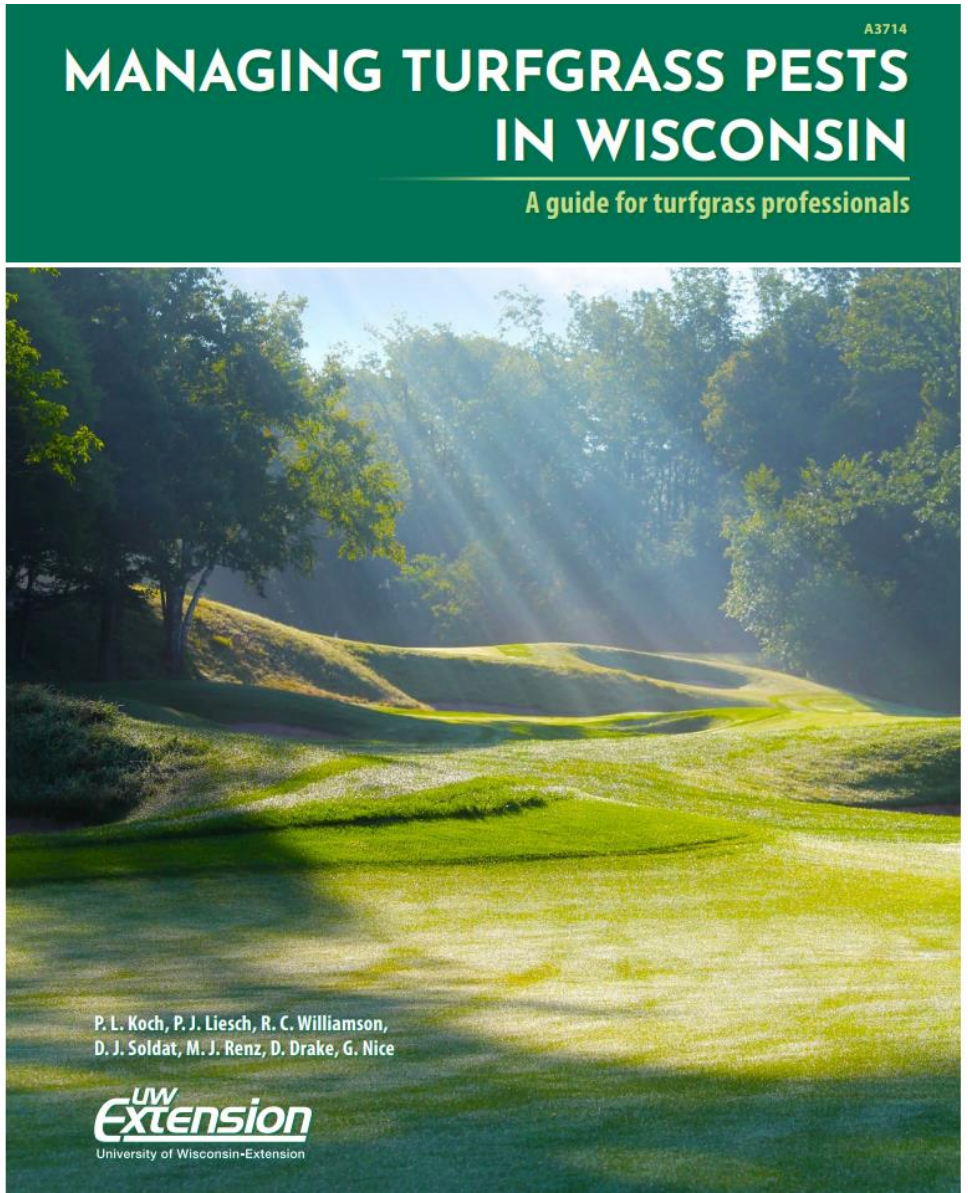
- Hand removal
  - PRO: effective
  - CON: time consuming
- Herbicide
  - PRO: effective, minimal disturbance
  - CON: cost, exposure
- Heat/Steam
  - PRO: effective, non-herbicide
  - CON: purchase cost, labor

Controlling dandelions in brittingham park turf

- What is the goal of the this area?
- How do dandelions impact these goals?
- Regulations?
- What are management methods available?

Management of Dandelions

- Hand removal
  - PRO: effective?
  - CON: time consuming, causes soil disturbance
- Herbicide
  - PRO: effective, minimal disturbance
  - CON: cost, exposure
- Fertilization
  - PRO: early greenup
  - CON: application near water body



Documenting selection process

chose to use glyphosate to control garlic mustard in the wooded areas

- Evaluated effectiveness
  - Consulted UW extension factsheet that rated it effective
- How applied to limit impact
  - Made application in early spring before most other species germinated
  - Spot treated, so limited herbicide use/exposure
  - Sign area to avoid public exposure
- Other methods evaluated
  - Hand pulling (didn’t have people, didn’t want to disturb soil increase other weeds)
  - Other herbicides, could have used others but more expensive, residual activity

Benefits of a clear plan and communication

- Douglas County ordinance :illegal to apply pesticides on public lands
- County forests/woodlands are being over-run by invasive shrubs
  - Bush honeysuckle
  - Buckthorn
- Attempting to control with grazing (goats),
  - spending $2,000 per/acre year each year for over three years with limited success.
- We were contacted to compare other options
  - Foliar and basal bark herbicide applications

Communicated results

- Applied Garlon 4 (triclopyr) to 15,000 ft2 of the woods.
  - used 3.9 fl oz across both areas (small amount).
- estimated cost for application : $76/A for the foliar and $91/A for cut surface.
  - Compare to the $2,000 per acre cost (annually for grazing)
- Measuring impact of methods on target and non-target species
  - treated plants were killed, but new seedlings are establishing from nearby untreated areas
  - No impact to plant cover or # of species 3 or 12 months after treatment

Summary

- Vegetation will continue to require management to meet the desired goals
- An adaptive plan should be developed that focuses on utilizing resources efficiently to meet the objectives
- A range of tools are available for prevention and management
  - The biology, effectiveness, cost, and environmental impacts all need to be considered when making the decision
- Staff with knowledge of land and tools should be empowered to document the decision making process
  - Information is available to assist in this process