Stantec

Town of Wilson

Invasive Species Management Overview

Agenda

1. Invasive Species Overview
2. Identification & Control Strategies
   - Woody Species
   - Herbaceous Species
3. Adaptive Management Strategies

Stantec At A Glance

1954
Stantec founded

$4B
Market Cap ($CAD)

22,000+
Employees globally

STN
Traded on NYSE & TSX

6
Continents we operate in

350
Locations worldwide

Stantec Environmental Services

3,000+
Employees

200+
Locations

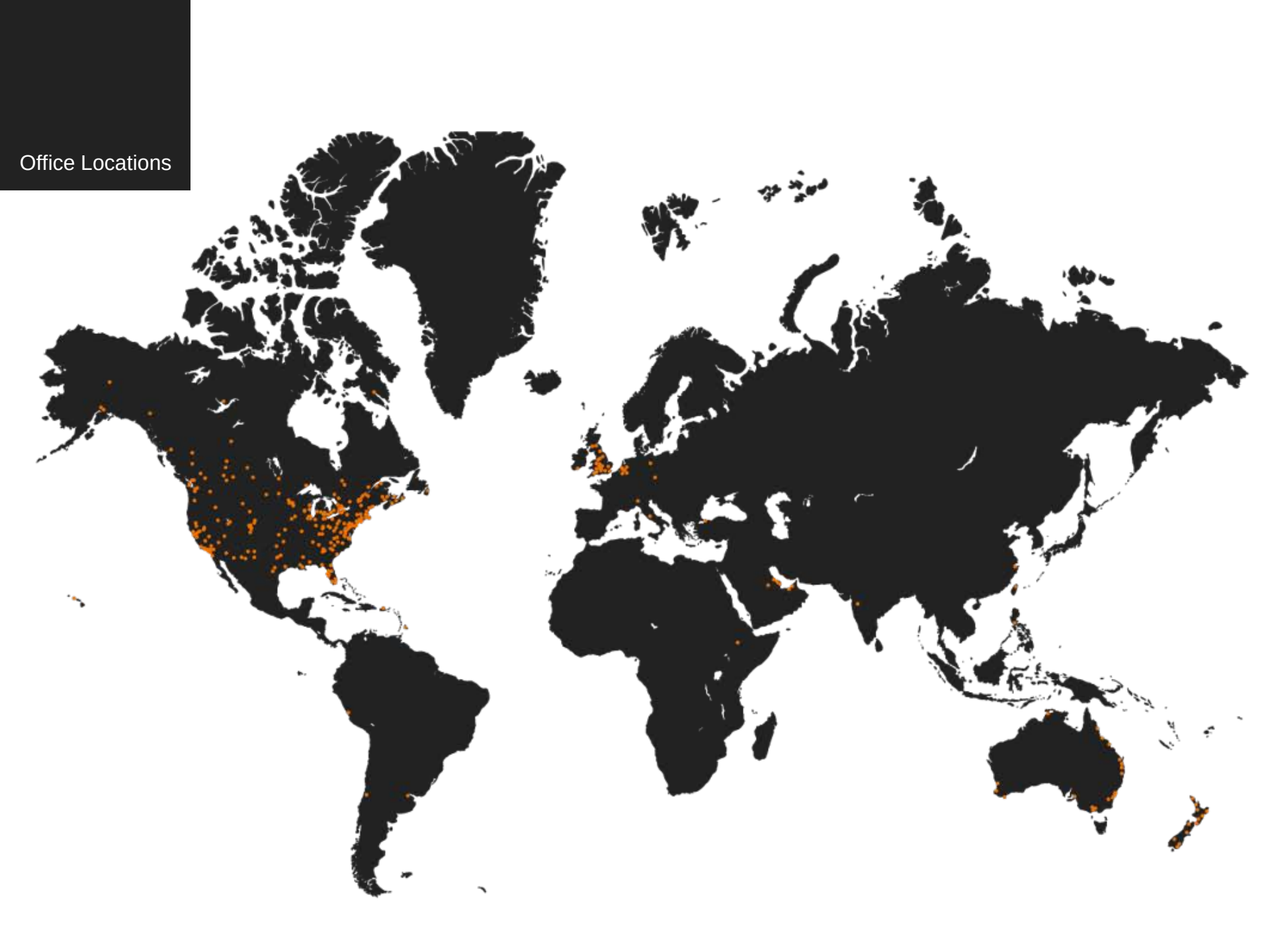
10K+
Active Projects

350+
Subject Matter Experts

20+
Technical Specialists

25
ES BCs across North America

Office Locations



Town of Wilson

Invasive Species Overview

Invasive Species – *what are they?*

A non-native species that causes harm

- Environment
- Economy
- Human, animal, or plant health

- Very aggressive – take over native communities
- Thrive on disturbance
- Often spread by humans unintentionally

Town of Wilson

Identification & Control Strategies: Woody Species

AUTUMN OLIVE

- Large deciduous shrub with silvery foliage. Autumn olive grows up to 20’ tall. Twigs are covered by small silvery scales.
- **Ecological threat:**
  - Autumn olive invades open and forested natural areas, as well as roadsides and agricultural fields.
  - It thrives in high light conditions where it can produce numerous fruits.

AUTUMN OLIVE

COMMON BUCKTHORN

- Tall understory shrub or small tree up to 20-25’ tall, often with several stems arising from the base, and spreading crown. (Caution: native plums and cherries have a similar bark). Cut bark exposes yellow sapwood and orange heartwood. Twigs often end in stout thorns.
- **Ecological threat**
  - Invades oak forests, riparian woods, savannas, prairies, old fields, and roadsides. It thrives particularly on well-drained soils.
  - Common buckthorn has a broad environmental tolerance. It leafs out very early and retains its leaves late into the growing season, giving them a longer growing season than native plants.
  - Creates dense shade, eliminating regeneration of tree seedlings and understory species.
  - Allelopathic; produces chemical compounds that inhibit the growth of other vegetation.

COMMON BUCKTHORN

COMMON BUCKTHORN

COMMON BUCKTHORN

GLOSSY BUCKTHORN

- Tall understory shrub or small tree grows up to 20’ tall, often with several stems arising from the base, and spreading crown. (Caution: native plums and cherries have a similar bark. Also easily confused with Alder species). Cut bark or branch exposes yellow-orange inner bark.
- **Ecological threat:**
  - Invades wetlands including acidic bogs, calcareous fens and sedge meadows. It also grows well in a variety of upland habitats and tolerates full sun to deep shade.
  - It can form dense, even-aged thickets, reducing light availability for understory species and preventing native tree regeneration.

GLOSSY BUCKTHORN

EURASIAN BUSH HONEYSUCKLES

- Dense, multi-stemmed deciduous shrubs that is 6-12’ tall. Young stems are slightly hairy and light brown while older stems may have shaggy, peeling bark and are often hollow between the nodes.
- **Ecological threat:**
  - Invade a broad range of habitats, including forest edges, open woods, fens, bogs, lakeshores, roadsides, pastures and old fields.
  - Honeysuckles alter habitats by decreasing light availability, depleting soil moisture and nutrients.
  - Eurasian bush honeysuckles have been widely planted as ornamentals and for wildlife habitat.

EURASIAN BUSH HONEYSUCKLES

EURASIAN BUSH HONEYSUCKLES

MULTIFLORA ROSE

- Thorny, thicket-forming shrub with wide, arching or climbing canes and stiff, curved thorns. Can reach 10-15’ tall and 9-13’ wide. Typically, more spreading than erect.
- **Ecological threat:**
  - Multiflora rose invades open woodlands, forest edges, old fields, roadsides, savannas and prairies. It can tolerate a wide range of soil and environmental conditions and full or partial sun. It does best on well-drained soils.
  - It is extremely prolific and can form impenetrable thickets that exclude native plant species.

MULTIFLORA ROSE

Native Rose

MULTIFLORA ROSE

JAPANESE BARBERRY

- A low-growing (2-3’ tall), dense, spiny shrub with small oval green leaves that turn reddish-brown in fall. Plants have single sharp spines at each node and small, bright red, oblong berries.
- **Ecological threat:**
  - Shade tolerant, drought-resistant, and adaptable to a variety of open and wooded habitats, wetlands, old fields and disturbed areas.
  - It forms dense stands in natural habitats, dominating the forest understory by shading out native plants and changing foraging habits of wildlife.
  - Research shows infested forests have higher rates of Lyme disease-carrying ticks.
  - Prefers well-drained soils and sunny habitats but will survive and produce fruit in even heavily shaded environments.
  - Widely planted as ornamentals.

JAPANESE BARBERRY

JAPANESE BARBERRY

Woody Invasive Control Strategies

Hand Clearing

- Cut/Drop – treat stumps with herbicide
  - Herbicide: Garlon4 Ultra
  - Herbicide: Glyphosate
    - **Need to use Glyphosate to control Honeysuckle**
- Use cut material to make habitat piles, or burn cut material
- Slower going; Involves manual labor and poses difficult working conditions.

Mechanical Forestry Clearing

- Fecon or Mulcher head attached to equipment
  - Faster, dramatic change.
- Access constraints, no initial herbicide control - requires re-sprout control

Woody Invasive Control Strategies (cont.)

Foliar Re-Sprout Control

- Broadcast or Spot Herbicide
- Approach depends on site conditions
  - Herbicide: Garlon 3A
  - Herbicide: Glyphosate
    - **Need to use Glyphosate to control Honeysuckle**

Prescribed Burning

- Controlled fire can kill seedlings and promote native growth
- Majority of woody species are highly susceptible to fire

Town of Wilson Project Sites

Stantec is working with the Town of Wilson at **Henry Mueller Conservancy** and **Balzer Wilderness Park**

- ✓ Implementing control techniques
- ✓ Targeting re-sprout control in the 2023 growing season
- ✓ Targeting invasive removal in the 2023 dormant season
- ✓ Performing a combination of Hand and Mechanical Forestry Clearing

Town of Wilson

Identification & Control Strategies: Herbaceous Species

JAPANESE KNOTWEED

- Japanese knotweed is an herbaceous perennial that forms large colonies of erect, arching stems (resembling bamboo). Stems are round, smooth and hollow with reddish-brown blotches. Plants reach up to 10’ and the dead stalks remain standing through the winter
- **Ecological threat:**
  - New infestations of Japanese knotweed often occur when soil contaminated with rhizomes is transported or when rhizomes are washed downstream during flooding.
  - It poses a significant threat to riparian areas where it prevents streamside tree regeneration and increases soil erosion.
  - Plants contain allelopathic compounds (chemicals toxic to surrounding vegetation).

JAPANESE KNOTWEED

JAPANESE KNOTWEED

Japanese Knotweed Control

- Spot or broadcast Herbicide Application
  - Glyphosate or Milestone
- Mowing/Burning
- Use all 3 techniques for best results (Mow, Apply Herbicide, Burn thatch)

INVASIVE PHRAGMITES

INVASIVE PHRAGMITES

- Invasive phragmites or common reed is a tall, perennial grass that aggressively colonizes and forms dense stands in freshwater wetlands.
- **Ecological threat:**
  - Invasive phragmites can be found along shorelines of lakes, exposed lake beds, marshes, streams, swamps, rivers, roadside ditches, heavily disturbed sites and other low, wet areas
  - Invasive phragmites harms the environment by reducing wildlife habitats, decreasing plant diversity, and altering water levels by trapping sediments. Tend to form extremely dense monocultures.
  - Invasive phragmites has a dense root/rhizome system, up to 7ft deep. Spreads through underground and above ground runners that can be over 10ft long. Can be up to 15ft tall.

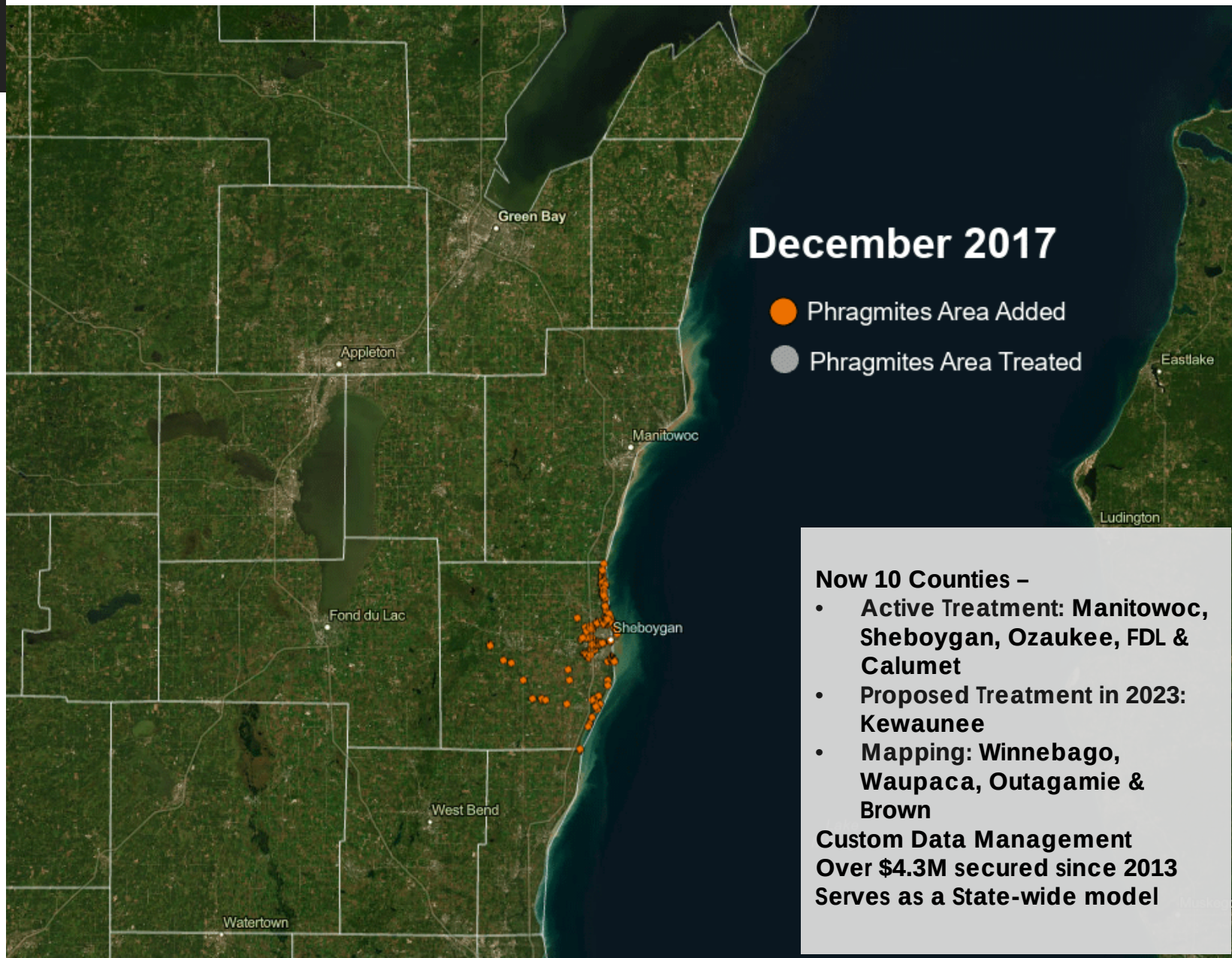
Invasive Phragmites Deep-Dive:
Distinguishing Between Native vs. Non-Native

Characteristic	Native	Invasive
Stem color	Stem nodes are shiny and reddish-purple	Stem nodes are tan-green, dull and rigid
Leaf color	Lighter, yellow-green	Dark blue-green
Rhizome	Yellow	White to light yellow
Growth habit	Co-occurs with other plants	Tend towards mature, dense, monotypic stands
Other	Leaf sheaths fall off during the winter, leaving bare stems standing in the spring	Leaf sheaths do not fall off, litter from the previous year has remnant leaves.

Collaborative Phragmites Control Program

- **Project Purpose: protect and enhance the resiliency of the Great Lakes region by supporting an innovative, grass-roots effort to manage problematic invasive species.**
- **Initiated in 2012**
- **Non-profit Partners – Glacierland & LNRP**
- **Collaborative team of non-profits, municipalities, consultant and landowners**
- **Hundreds of acres treated annually**
- **Ongoing public outreach/education**

Collaborative Phragmites Control Program



Now 10 Counties –

- **Active Treatment: Manitowoc, Sheboygan, Ozaukee, FDL & Calumet**
- **Proposed Treatment in 2023: Kewaunee**
- **Mapping: Winnebago, Waupaca, Outagamie & Brown**

Custom Data Management
Over $4.3M secured since 2013
Serves as a State-wide model

Roles and Responsibilities

- Partner Non-profits
  - Grant administration
  - Staff Support (interns)
  - Education and Outreach
  - Fundraising
- Stantec's role:
  - GIS data management
  - Mapping oversight
  - Education/outreach
  - Partner development
  - Treatment
  - Monitoring
  - Landowner POC

Municipality	Acres Treated				
	2018	2019	2020	2021	2022
Manitowoc County	327.8	489.5	635.2	374.2	240.5
Sheboygan County	26.4	86.2	103.1	147.3	30.4
Ozaukee County		0.36	48.5	33.6	32.1
Fond du Lac County		52.7		55.9	105.2
Calumet County		19.2		57.5	126.0
TOTAL:	**354.2**	**647.96**	**786.8**	**668.5**	**534.2**

http://bit.ly/InvasiveWebMap

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CANADA THISTLE

- Herbaceous perennial, 2-6.5’ tall with upright, grooved stems that branch near the top of the plant. The stems are hairy.
- **Ecological threat:**
  - It invades areas such as prairies, savannas, glades, dunes, streambanks, sedge meadows and forest openings. It also invades croplands, pastures, lawns, gardens, roadsides, ditches and waste sites.
  - Once it has established it spreads quickly, forming monocultures.

CANADA THISTLE

CANADA THISTLE

COMMON TEASEL

- Herbaceous perennial. Grows as a basal rosette for at least one year. Forms a prickly, angled flowering stalk, 2-6’ tall, typically in the second or third year.
- **Ecological threat:**
  - Invades open areas, prairies, savannas, and sedge meadows, as well as roadsides and disturbed areas.
  - Rapid range expansion of cut-leaved teasel has been observed in several midwestern states.

COMMON TEASEL

COMMON TEASEL

Canada Thistle/Teasel Control

- Spot or broadcast Herbicide Application
  - Transline or 24D (Broadleaf Selective)
- Mowing
  - Prolongs treatment window
  - Prevents seed dispersal/production

GARLIC MUSTARD

- Herbaceous biennial with stems 2-4’ tall. First-year plants form a basal rosette that remains green through the winter. Second-year plants produce one to several flowering stems.
- **Ecological threat:**
  - It Invades high-quality upland and floodplain forests and savannas, as well as disturbed areas, such as yards and roadsides. It is sometimes found in full sun, though most often grows in areas with some shade, and does not do well in acidic soils.
  - Native herbaceous cover has been shown to decline at sites invaded by garlic mustard.

GARLIC MUSTARD

DAME'S ROCKET

- Showy, short-lived perennial or biennial, 3-4' tall. Flowering stalks emerge in spring.
- **Ecological threat:**
  - Invades moist and mesic woodlands, on woodland edges, along roadsides and in open areas.
  - Dame's rocket is thought by many to be a native wildflower
  - It quickly escapes cultivation because of its prolific seed set.

DAME'S ROCKET

Garlic Mustard/Dames Rocket Control

- Spot or broadcast Herbicide Application
  - Garlon 3A (Broadleaf Selective)
  - Target early spring for control
- Mowing
  - Prolongs treatment window
  - Prevents seed dispersal/production
- Hand Pulling

PURPLE LOOSESTRIFE

- Wetland perennial, three to seven feet tall, with up to 50 stems topped with purple flower spikes. One main leader stem, but many side branches often make the plant look bushy
- **Ecological threat**
  - Prefers moist soils and shallow waters where it competes with native wetland plants. It will adjust to varying light conditions and water levels.
  - Has been widely planted as an ornamental where it escapes to nearby waterways.
  - Native Winged Loosestrife lookalike.

PURPLE LOOSESTRIFE

Purple Loosestrife Control

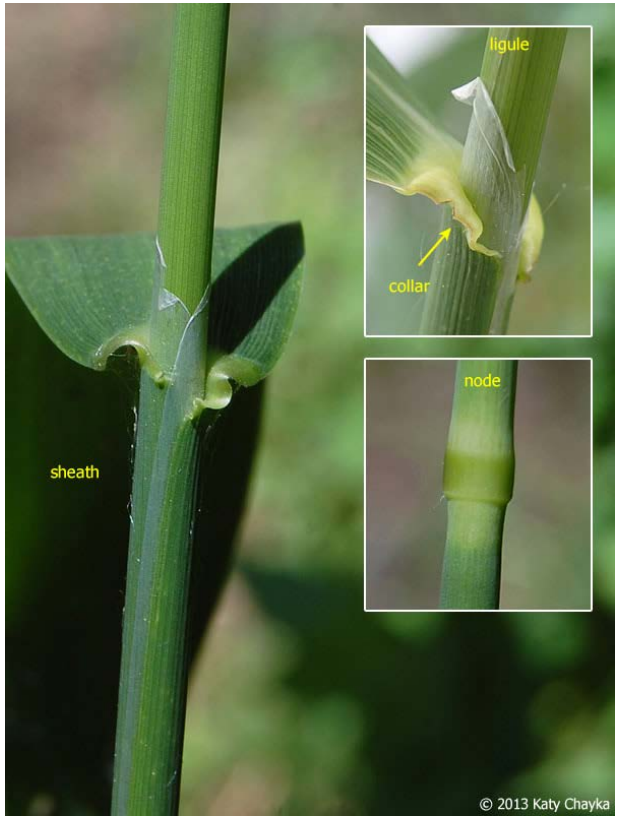
- Spot or broadcast Herbicide Application
  - Garlon 3A (Broadleaf Selective)
  - Glyphosate (Non-Selective, Aquatic Approved)
- Hand Pulling
  - Large taproot attached, but effective method in low density populations
- Biocontrol – contact WDNR

REED CANARY GRASS

- Reed canary grass is 2-9 foot tall. The stem is hairless and stands erect. One of the first grasses to sprout in the spring.
- **Ecological threat:**
  - It forms dense, persistent monospecific stands in wetlands, moist meadows, and riparian areas that outcompete desirable native plants.
  - Reed canary grass dominates a significant number of wetlands in the Midwest

REED CANARY GRASS

REED CANARY GRASS



Reed Canary Control

- Spot or broadcast Herbicide Application
  - Clethodim (Grass Selective)
  - Glyphosate (Non-Selective, Aquatic Approved)
  - Target early spring for control
- Mowing
  - Prolongs treatment window
  - Prevents seed dispersal/production
- Burning
  - Removes thatch
  - Flush seed bed – make control methods easier and drain seedbank

WILD PARSNIP

- Herbaceous, monocarpic perennial. Grows as a rosette with upright leaves, persisting for at least one year. Flowering stems are stout, hollow, grooved and up to 5' tall.
- **Ecological threat:**
  - Invades prairies, oak savannas and fens as well as roadsides, old fields, and pastures.
  - Broad habitat tolerance; grows in dry, mesic, or wet habitats, but it does not grow in shaded areas.
- **CAUTION:** When sap contacts skin in the presence of sunlight, it can cause severe rashes, blisters, and discoloration of the skin (phytophotodermatitis). Wear gloves, long sleeves and long pants when handling.

WILD PARSNIP

Wild Parsnip Control

- Spot or broadcast Herbicide Application
  - 2,4-D (Broadleaf Selective)
- Digging
  - Use shovel to cut taproot below surface 1-3” below surface
    - Can be successful in low density populations
    - Use extreme caution using this method.

Town of Wilson

Adaptive Management Strategies

Summary of Restoration Techniques

- Mechanical Clearing
- Hand Clearing
- Herbicide Application
- Hand Pulling/Digging
- Prescribed Burning
- Management Mowing
- Native Seed or Tree Planting

REMEMBER:

- Control techniques are **Restoration techniques**
- The ***more strategies*** you can use, the ***greater your success***

Additonal Resources

- https://sewisc.org/invasives
- https://dnr.wisconsin.gov/topic/Invasives/RegulatedSpecies
- https://dnr.wisconsin.gov/topic/Invasives