Fish Creek Park – Invasive Species Walk-through
June 29, 2017

Highest Priority Species:

Reed Canary Grass – *found mainly along the Creek itself as well as the oxbow. A more thorough inventory will be conducted later this summer.*

Ligule of reed canary grass - shown by gently pulling the leaves away from the stem.

Reed canary grass is a perennial, cool-season, rhizomatous (grows interconnected root system underground) in the grass family. It is native to Eurasia. Its creeping rhizomes (like roots) form a thick sod layer, which can exclude other plants and make reed canary grass difficult to eradicate. Reed canary grass most commonly occurs in wetlands, wet ditches, along roadsides, and in river floodplains. Although it prefers seasonally or continually wet habitats, it has been identified in dry uplands and can tolerate prolonged periods of drought. The upright stems of reed canary grass can grow up to six feet tall and the leaf blades are up to 1.5' long and 2cm wide. The stems or reed canary grass are hollow and the plant has prominent, membranous ligules (shown in the picture below and a great trait to identify from other grasses). It's seed head or inflorescence is compact and resembles a single spike when immature, but as the season winds on it will become open and spreading. These seed heads will also be pale green to dark purple in color early on and then will become straw colored when the seeds have developed.

Reed canary grass is the double-whammy when it comes to spreading. It can reproduce both vegetatively by its rhizomes and by rhizome fragments, as well as by its abundantly produced seed. Though it probably has a relatively low establish rate from seeds, each seed head can produce approximately 600 seeds (so even if only 1% is viable, it means six new plants could be produced from each individual seed head). In reoccurring populations of reed canary grass are likely emerging from the rhizomes. The seeds can be dispersed in animal fur, on human clothing, or on recreational vehicles; however, the most common means by which it spreads is likely by water.

Control of Reed Canary Grass

There is no immediate one-year "fix" to return an area with reed canary grass into a native plant community, but you can accomplish a lot in 2-3 years. Continued monitoring and follow-up should be done for 5-10 years after it appears to be controlled.

Isolated plants or small patches of reed canary grass can successfully be removed by digging out and removing the entire root mass. You would want to be sure to remove all rhizomes and root, as small fragments can re-sprout. Properly dispose of plant material since both rhizomes and stems can develop new roots if kept in contact with moist ground. Remember also that digging results in the disturbance of the ground – so keep an eye out for other invaders that may take advantage of this!

Mowing or cutting by itself will not kill reed canary grass. In fact, if reed canary grass is mowed only once or twice per year, it can stimulate the plant to produce more stems. Continued mowing (5x or more per year) for five to ten years has been shown to manage reed canary grass. Mowing can be used in combination with another control method as described below. Additionally, mowing prior to or at the onset of flowering can eliminate seed set for that year.

Reed canary grass can be successfully controlled with the proper use of herbicide. Small stands or clumps may be killed with one or two applications, but large infestations will likely require multiple years of application to be effective. If the reed canary grass would be growing in an area that is wet (meaning your socks would get wet if you were standing in them), only aquatic approved herbicides are allowed (e.g. Rodeo, Aquaneat tradenames). As with all herbicide use, be sure to read and follow all label instructions and to abide by all state regulations. Glyphosate (e.g. Roud-up, Rodeo®, among others) applied at approximately 3% active ingredient works well. You would not want to use a mix stronger than 5% active ingredient at most. Glyphosate is a non-selective herbicide that kills or injures nearly all plant species that it encounters. It is also the active ingredient in the commonly used herbicide Round-up®, which along with others is not labeled for aquatic use, so be aware of where you are applying. Depending on the size of the infestation of reed canary grass will dictate the method used – I would recommend a hand-wick method or spot spray method for the small areas we identified. The hand-wick method (aka "glove of death") involves placing a cotton glove over a chemical resistant glove that goes well up the arm. Then use a small sprayer to wet the cotton glove and hand-swipe or -wick the chemical onto the plant being careful not to come in contact with other vegetation. A spot spray method means using the spray and the mist the herbicide on the reed canary grass foliage directly – which increases the chance for herbicide to drift onto other vegetation through the air. The herbicide should be applied to the foliage during the growing season – typically in early summer (June) or in the late fall (just prior to wintertime die-back and after many of our native plants have begun to die back for the season). These are the times when reed canary grass is most actively moving carbohydrates (along with the herbicide) down to the root system of the plant.

Typical stand of reed canary grass in flower.

You may also combine an herbicide treatment with another control treatment for best results. One way you can do this is to eliminate the aboveground dead litter through cutting or mowing and then allowing the new reed canary grass stems and leaves to regrow up to boot height. This helps obtain better herbicide coverage and reduces total herbicide use, since you are spraying only living, green reed canary grass that is 12" tall versus 6' tall and mixed with old dead leaves. You would want to cut during the winter or spring, not when the plant has seed heads developed on green stems.

Calculating a percent mix for herbicides:

(***X*** oz. herbicide)(% active ingredient in the herbicide) = (oz. of mix needed)(% active ingredient desired) – solve for ***X***

Example

Label for packaged herbicide solution reads that that is 41% glyphosate and you would like a 2% glyphosate mixture. You would like to mix 1 gallon (128 oz.) of herbicide.

(X oz. herbicide)(0.41%) = (128 oz.)(0.02%)

0.41X = 2.56

X = 6.2 oz. of packaged herbicide solution

in 122 oz. of water will yield a 20% glyphosate mix.

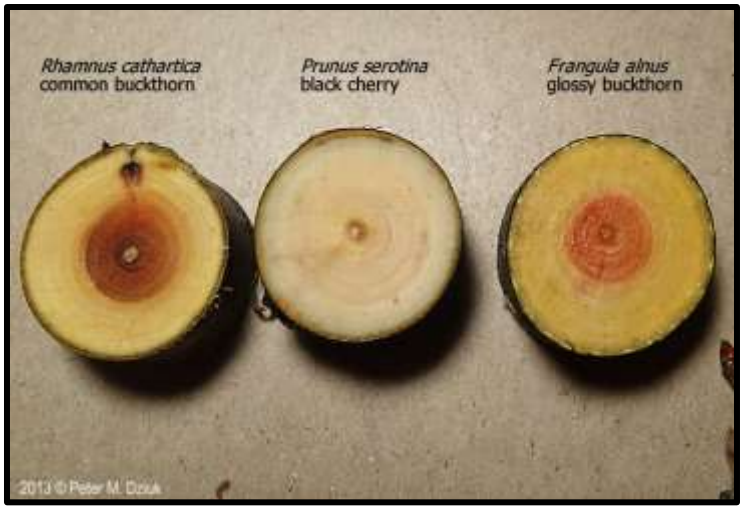
<u>Woody Invasive Shrubs</u> – *found throughout the Park in varying densities. Of these species, Japanese barberry is most abundant, however all can be controlled in the same manner.*

Japanese Barberry – A low-growing (2-3' tall) dense, spiny shrub with small oval green leaves that will turn reddish in the fall. Plants will have sharp spines where the leaves meet the stem and will produce small, birght red, oblong berries. Commonly planted as an ornamental or landscaping plant, Japanese barberry is both shade tolerant and drought resistant which makes it adaptable to a variety of habitat. It can form dense stands in natural areas, ultimately shading out the native plants and changing foraging habits of wildlife. Research has also shown areas infested with barberry to have higher rates of Lyme disease carrying ticks. Besides spread by seed, it can also spread vegetatively through horizontal branches that root freely when they touch the ground.

Non-native Bush Honeysuckle – There are four species of honeysuckle listed as invasive in Wisconsin. These species invade a broad range of habitats and alter them by decreasing light availability, depleting soil moisture and nutrients, and possibly releasing chemicals that inhibit the growth of native plants. To identify, look for red/orange berries, leaves opposite one another coming off the stem, and leaves without "teeth" (smooth along the edges). When in doubt, the stems are hollow in the very middle if you cut a more mature stem.

Glossy Buckthorn – Tall understory shrub or small tree that grows up to 20' tall, often with several stems arising from the base. The bark is gray to brown with prominent white or light-colored lenticels (linear raised markings). It should be noted that native plums and cherries also have a similar bark. If you cut the bark or a branch it will expose a bright orange/yellow inner bark that can aide in identification. The leaves have a simple edge to them and are mostly alternate one another on the stem (versus two leaves being directly across from one another). The leaves have prominent veins in them that come straight out from the mid-rib of the leaf and curve only slightly toward the tip. The leaves will stay green into the fall, which can also help with identification. Glossy buckthorn will produce abundant clusters or round, pea-sized fruit. The fruit will ripen to a red or dark purple in late summer. This shrub can form tall, even-aged tickets, reducing the light available for other plant species and preventing native tree regeneration.

Common Buckthorn – This is tall understory shrub that can grow up to 20-25 feet tall, often with several stems arising from the base. Like glossy buckthorn (described on following page), common buckthorn has prominent light-colored lenticels (raised linear marks on the stem). Be aware that some of the native plum and cherries also have similar bark! If you cut the bark of buckthorn it will expose yellow sapwood and orange heartwood. The twigs will often end in stout thorns. The leaves have prominent veins curving toward the top and will have tiny teeth along their edge. Common buckthorn will leaf out very early in the spring and hold its leaves late in the fall. This shrub can create dense shade and eliminate the regeneration of tree seedlings and other native species. It also produces chemical compounds that inhibit the growth of other vegetation.



Control of Woody Invasive Shrubs

Manual Removal – Cutting these invasive shrubs will initially encourage the roots to sprout new shoots. Cutting or mowing removes above-ground growth of established plants and prevents additional seed production, but rarely kills plants. Established plants persist after cutting or mowing for many years. Pairing mowing with another technique (such as foliar spray of herbicide) increases the effectiveness. Cutting before seed is produced in summer and again after the plant has re-sprouted in fall will reduce the vigor or re-sprouts the following year, but it will not kill the plants. If seeds are present when removed, avoid movement off-site unless material can be transported in a way that will not spread the fruit to another location in between. Burning material, piling and covering with a tarp, or landfilling branches with berries are all acceptable options.

Pulling small seedlings of honeysuckle, autumn olive, barberry, or glossy buckthorn is an option typically if the soil is moist and the stems have a diameter of less than a quarter inch. Larger plants may be pulled using a weed wrench, although it disrupts the surrounding soil, which can uproot native plants nearby and hinder the recovery of the site. For infestations over an acre in size, a weed wrench may exhaust your energy before the plants are controlled.

Herbicides for Woody Invasive Shrubs

The only time of the year that is not ideal for treating these species with herbicide would be in the early spring when the sap is flowing upward since you want the herbicide to be pulled down into the roots of the shrub. The active ingredient Glyphosate (trade names: Rodeo, RoundUp, Cornerstone, Accord, RazorPro, etc.) is most effective in late summer through late fall. Glyphosate is a non-restrictive use herbicide, so anyone can purchase and use it. Unlike some herbicides, glyphosate is not selective, meaning it will kill or damage any plants that it contacts. Be careful not to spray other plants when using this chemical. One example of a glyphosate product is:

- Round up Super Concentrate (EPA # 71995-25) 50% glyphosate; sold at hardware stores in 16oz container (approx $30-45)

You would want to dilute the mix to make it closer to a 20-25% glyphosate mix, since you don't want to "top kill" the plant and cause the herbicide to not get to the root system.

The active ingredient Triclopyr (trade names: Garlon, Tahoe, Remedy, etc.) can be used year-round to control woody shrubs also. Triclopyr is also a non-restrictive use herbicide. It is selective - meaning it will only kill certain types of plants, but has very little impact on other plants. A few examples of triclopyr products are:

- Garlon 3A (EPA # 62719-40) 44.4% triclopyr; sold in 2.5-gallon containers (large quantity!) from Forestry Suppliers online at www.forestry-suppliers.com (approx. $240)
- Ortho Max Poison Ivy & Tough Brush Killer (EPA # 239-2491) 8% triclopyr; sold at Hardware stores in 16- or 32-oz. containers.

You would want to dilute the triclopyr to about 12.5% for woody invasive species. The calculation to dilute triclopyr or any other herbicide can be found on Page 2 of this document.

Using Herbicides – The Cut Stump Method for the Control of Woody Invasive Shrubs

You will need: Loppers or bow saw (depending on size of the shrub), rubber or chemical gloves, long sleeves and plants, sturdy shoes, an herbicide spray bottle with appropriate herbicide mix, liquid dye (such as food coloring or Rit dye), and safety glasses.

Step 1 – Herbicide mixing: Wearing appropriate safe wear, pour the herbicide into a spray bottle. For glyphosate, dilute 1:1 with water (to produce a mixture that is at least 20% glyphosate). Add enough dye so you will be able to tell where you have treated. Label the bottle with a piece of tape, indicating the chemical, how it was diluted, and when it was mixed. Be cautious when diluting and if possible, mix over an impervious surface - any spills on grass or other plants will kill them.

Step 2 - Treatment: On a day where it will be free of rain for at least 1 hour after treatment, cut the stem of the plant 2-3 inches above the soil. Wearing rubber gloves, spray immediately with herbicide mixture. You will only need to spray the cut surface of the plant stem and overspray will harm surrounding plants.

Step 3 - Timing: You must wait at least 7 days before re-cutting, mowing or disturbing treated stems. The herbicide needs time to move into the roots for an effective kill.

Step 4 - Disposal: Small seedlings (without flowers or fruit) can be pulled and left with the roots exposed to dry out - **once fully dead and dried** they can be composted or left on site. Larger plant material (without fruits or seeds) can be chipped and used as mulch on site, but only added to compost once fully dead and dried. You can dry plants by covering above and below with dark tarps for several weeks. ***During or after flowering*****:** DO NOT COMPOST - Instead, minimize the movement of the plants on the site to prevent unnecessary dispersal. Leave them at the site or bag for disposal in a landfill. Brush piles may be made from dried material, however if material contains flowers or seeds, cover the pile to prevent spread by birds and other organisms. Dried plant material can also be burned, but ONLY in accordance with all federal, state, and local laws and ordinances.

Step 5 - Monitoring: If the plants re-sprout, you may use the cut-stump method again. Or you may use a 2% active ingredient solution of glyphosate to spray the leaves, called a foliar spray. If you choose to use a 2% solution, follow the manufacturers guidance for dilution or call for assistance. Foliar spraying requires near complete coverage of the leaves to be effective, but overspray and damage to surrounding plants are more likely using this method.

<u>Dames Rocket</u> – *found throughout Park in varying densities with some dense patches identified. Also identified on properties adjacent to the park, which could pose continued threat due to high seed production.*

Basal rosette of Dames Rocket during its first year of growth.

Because Dame's Rocket has a biennial (two-year) lifecycle, pulling can be effective in reducing the population over time. It is effective at any stage, but easiest to pull just before flowering due to the plants size. For pulling to be effective however, the entire tap root must be removed. If flowers are present, bag material and dispose of in a landfill or burn to avoid potential seed spread. It will take 2-5 years of pulling to suppress populations, but longer term is needed to eliminate established populations due to the large number of seeds produced. If desired, you could also spray rosettes (first-year, low growing plants shown right) or flowering plants with an herbicide such as Roundup (glyphosate). You would want to apply a 1-3% mix to the rosettes in fall or spring, using a higher percentage when the air and soil temperature drop below 40F. Dame's rocket rosettes do stay green well into the fall and winter months after our native plants have long died back for the year.

<u>Wild Parsnip</u> – *found in low densities along the trail in several areas. Poses highest concern because when sap contacts skin in the presence of sunlight, it can cause severe rashes, blisters, and discoloration of the skin (phytophotodermatitis).*

Wild parsnip grows in large patches or as scattered plants along roadsides, in abandoned fields, on pastures, on restored prairies, and in disturbed open areas. When flowering, it has numerous, small, 5-petaled, yellow flowers bunched together in umbels 2-6" wide at the tops of stems and branches. Blooms from late spring to mid-summer. Wild parsnip also has a biennial (two-year) lifecycle, though sometimes it can remain in the rosette stage for multiple years before flowering and dying. Pulling, severing the root with a shovel-cut method, mowing before flowering/seed set, or cutting of seed heads repeatedly can be effective in reducing the population over time. If flowers are present, bag material and dispose of in a landfill or burn to avoid potential seed spread. It will take multiple years to suppress populations and longer term is needed to eliminate established populations due to the large number of seeds produced. If desired, you could also Spot treat rosettes with 2, 4-D, metsulfuron methyl, or glyphosate.

Lower Priority Species Identified: *The following species were found in low density within the park.*

Garden Valerian – a tall, herbaceous perennial plant that emerges in early spring and can grow to be 2-4 feet in height. Garden valerian, also called garden heliotrope or common valerian, was introduced as a medicinal and ornamental plant. It can escape and invade upland forests, wetlands, woodland swamps, grasslands, stream edges, and other habitats. It is tolerant of both wet and dry conditions and its early emergence, vigorous growth, and ability to self-seed give this species a competitive advantage resulting in displacement of native species. To identify garden valerian, look for stout, green to reddish, hollow stems that are finely ribbed and hairy. The leaves of garden valerian and opposite from one another on the stem and are pinnately compound – meaning that a single leaf coming from the main stem will have 5-25 toothed leaflets. Most of the leaves will be clustered toward the base of the plant. The flowers are white to pale pink and are arranged in tight clusters at the top of the plant. It will bloom May through August. A helpful video to learn to ID garden valerian can be found at https://www.youtube.com/watch?v=QSVB20tZ2us.

Garden valerian can be mowed or dug prior to seed set, being sure to remove roots, rhizomes, and the low-growing rosettes of immature plants. Because the species forms rosettes, mowing can be used to prevent seed set but will not eradicate the plant. Foliar spray using herbicides such as glyphosate, triclopyr, and 2,4-D before seed production.

White Sweet Clover - White sweet clover is an herbaceous biennial, meaning it has a two-year life cycle. The first year the plants will not bloom. Second-year plants will grow 3-5' high and are bush-like with multiple branches. The stems are often hollow as well. White sweet clover is known for readily invading prairies, savannas, dunes, roadsides, and abandoned fields. In its second year of growth, sweet clover will bloom in late spring or summer and will have five-parted, small, white, pea-like flowers that are very fragrant and clustered in dense spikes. White sweet clover can produce up to 350,000 seeds per plant and the seeds have been shown to be viable in the soil for up to 30 years, so it is very important to control white sweet clover that is flowering so seeds are not produced.

You can hand pull small populations of sweet clover before seed set if soil conditions allow. If conditions do not allow, or the infestation is large, you can use a clippers or brush-cutter to remove the flowering stems before seed set. Only eliminating the above-ground portions of the plant may result in white sweet clover re-sprouting and flowering later in the season, so you would want to follow-up and check a few weeks after the initial cutting.

Everlasting Pea – a perennial, trailing or climbing vine that can be up to 6' long. The stems have a distinct winged look. This species was introduced for erosion control and unfortunately is still sold in nurseries as ground covers and climbers. It can readily escape cultivation though and can smother native plants. Like other legumes, everlasting pea produces long, narrow smooth pods with 10-15 seeds. Pods start green and mature to brown which is when seeds are projected outward. Everlasting pea is like many wild peas, but separates itself from many by having winged stems and only two leaflets (shown in lower picture).

There is limited information available on the control of everlasting pea. Hand pull small infestations can be effective. If possible you'd want to remove all the roots as this is a perennial plant. Prescribed burning if possible can help control large populations. The Wisconsin DNR recommends a foliar spray of 2% triclopyr ester. You would likely want to do this treatment before the flowers open on the plant. Limited research out west shows a wide range of herbicide active ingredients can be effective including aminopyralid, chlorsulfuron, clopyralid, glyphosate, imazapyr, metsulfuron, picloram and triclopyr, however the rate of application is not provided. DCIST would recommend trying glyphosate or triclopyr via a hand-swiping method where a cotton glove is worn over a chemical glove and the chemical is sprayed onto the glove and then swiped onto the plant to cover the surface of the leaves and stem. This is recommended if possible because everlasting pea is often found growing on and among native vegetation. A foliar spray (i.e. backpack or hand sprayer) directly onto the leaves of everlasting pea could kill desirable native vegetation that it is growing on.

Butter-and-Eggs – a perennial plant that can grow 1-2' high. The leaves are long and narrow and the flowers are bright yellow with orange blooming in mid-July through September. Butter-and-eggs not only spreads by seed, but also vegetatively and root fragments the size of 12" are capable of producing a new plant. This invasive plant can adapt to various habitats and site conditions. Especially in gravelly or sandy soils it is capable of outcompeting native plants. Frequent mowing or pulling of butter-and-eggs will weaken the plant, or you can spray with a broadleaf herbicide like the ones described previously.

Butter-and-eggs flowering.

Forget-me-Not – Woodland forget-me-not is a creeping woodland perennial plant that is often used in gardens. The five-petaled flowers are small, blue with a bright yellow center. Unfortunately, woodland forget-me-not can quickly crowd out native plant species and is able to form large monocultures. It can also reduce numbers of spring ephemeral wildflowers. It is difficult to control due to its mechanisms for spreading. It is capable of abundant reproduction through spreading stolons (runners above or below ground) and abundant seeds. Smaller populations can be hand-pulled or dug before seed set. Be sure to remove as much of the root system as possible and monitor for re-sprouts. There is little information available on the effectiveness of chemical treatment for this plant, A however, spraying the vegetation with glyphosate in accordance with rates defined on the label may be effective.

Houndstongue in flower during second year.

Rosette or first-year plant of houndstongue.

Houndstongue – an herbaceous (non-woody) biennial plant that can grow to be 1-4' tall on a single stem which branches at the top. Houndstongue invades pastures, roadsides, grasslands, riparian areas, meadows, deciduous forest, and shorelines. It is toxic to horses and cattle. Its leaves are dark green and slightly hairy. In the rosette stage, the leaves are 6-8" long; in the second year of growth, the lowest leaves can be up to 12" long and will reduce in size as they progress up the stem. The flowers are arranged at the top of the plant on dropping panicles. The flowers are red-purplish and bloom from June into July. They have five petals and are saucer or funnel-shaped – quite unique compared to most plants that we see. Each flower will produce four very sticky seeds that are spread on pets, clothing and more.

You can pull houndstongue in moist soils, however the large taproot makes it difficult. More effective may be cutting second year plants while in the flowering stage before seed production or using a sharp shovel to cut 1-2" below the soil surface. Pulled or cut plants should be disposed of in a landfill or burned to prevent seed production.

Other Notes:

In addition to these species, a yellow foxglove was identified that could possibly be an escaped garden species. According to the Wisconsin Master Gardeners, "Yellow foxglove is easy to propagate from seed, and it often self-seeds under favorable conditions (but is not invasive)". A further description is found at https://wimastergardener.org/article/yellow-foxglove-digitalis-grandiflora/. At this time, it is suggested that the foxglove patch be monitored and possibly controlled should it be found outside of the existing area where it is found or should that area expand rapidly.

A species of vetch was noted near one of the trails. It was determined that this vetch is Hairy vetch, commonly used as an agricultural cover crop. This species is not a threat to established plant communities, but is noted as it may increase in density and abundance should disturbance occur.