

# **Township of Bayview**

## **Roadside Invasive Plant Management Plan**

### **2012**

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Northwoods Cooperative Weed Management Area

[www.northwoodscwma.org](http://www.northwoodscwma.org)





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## A. Introduction

According to Wisconsin state statutes, invasive plants are any species of plant that is not native to our area, and causes – or is likely to cause – harm to the economy, the environment, and/or human health. In an area where forestry, agriculture, tourism, and recreation are important to the economy, it is important to keep invasive plants from affecting those industries. In 2009, the state passed a rule, Chapter NR 40, which regulates the transfer, transport, introduction, and possession of invasive species. This rule affects the management of rights-of-way in Wisconsin.

The best time to begin managing invasive species is *before* they arrive in your area. Once they get a foothold, the best chance at controlling them is to start management as soon as possible, saving considerable time and money in the future. This plan will set priorities for the control or eradication of invasive plants that have already become established in the town, and outline practices to prevent the introduction of new invasive plants.

A prioritized list of the invasive plants on your town roads can be found in section C. Detailed descriptions and control tips can be found in section E. In addition, the map attached in section D illustrates the areas found to have invasive plants in a survey conducted during the summer of 2011.

We have also identified a list of priority trouble spots to target early efforts in the hope of minimizing the long-term workload. The first priority (after prevention) is to manage new infestations, beginning with those that are the fastest growing, cause the most damage, and occur near uninfested natural areas. It is also important to consider the difficulty of control, giving higher priority to infestations where control is most likely to succeed with available resources. Section F will detail the best management practices (BMPs) for rights-of-way in order to streamline this process. Section B and the attached appendices in section H offer additional recommendations and resources for the best results in controlling invasive plants.

## B. General Management Recommendations

### 1. Mowing Twice

Repeatedly mowing roadsides and rights-of-way (twice or more per year) helps prevent plants from being able to flower, and without flowers they do not produce seeds. In most cases, mowing will *not* eradicate invasive plants, but it can be a good strategy for containing their spread.

In order to prevent seed spread, it is important to mow before or during flowering, but *not* after. Mowing after plants have gone to seed is likely to spread the seeds in the wind, or allow them to attach to mowing equipment where they will hitch a ride to other areas. The mowing recommendations in Appendix 2 suggest times of year when mowing is likely to help or hinder invasive plant management (timing based on typical plant growth seasons in northern Wisconsin).

An alternative to repeated mowing is to use chemical “plant growth regulators” (PGRs). These chemicals stunt the growth of plants so they remain short throughout the growing season, limiting or eliminating the need to mow. Because of our short growing season, plant growth regulators can be a cost-effective alternative to mowing in our region. PGRs have an added benefit of preventing plants from reaching maturity, where they will

flower and produce seeds. This makes them a useful management tool in roadsides that are infested with invasive plants. As with any chemical application on public land or rights-of-way, this approach may not be acceptable or appropriate in some communities.

## **2. Monitoring Disturbed Areas**

Any time that road construction, maintenance, or a similar disturbance takes place, it sets the stage for new invasive plants to colonize. This is why culverts and bridges are often densely populated with invasive species. Gravel pits are also a hotbed for invasive plants, which can germinate in roadsides where the gravel is spread.

Inspect disturbed areas 2-3 times a year for at least three growing seasons following the disturbance (i.e. construction, etc.). Inspections can be carried out during mowing or other routine operations. Treat and remove any invasive plants that crop up before they have a chance to spread and become a much larger problem. Monitoring and managing invasives for at least three years will give desirable plants a chance to get established. Once the site is densely covered with plants that are *not* invasive, it is much harder for invasive plants to move into the site.

## **3. Seeding with Invasive-Free Mixes**

Historically, many invasive species (such as kudzu) were intentionally introduced for the purpose of erosion control, only to discover too late that they are nearly impossible to contain once introduced. To prevent this, use seed mixes that do not include invasive plants. Go with trusted species that are not persistent, and avoid new “miracle” species or seed mixes. Also, include annuals in your seed mix which will quickly germinate and cover exposed soil, making it harder for invasive plants to get a foothold. Species to avoid in seed mixes include bird’s foot trefoil and crown vetch. A sample seed mix is included in Appendix 4.

## **4. Routine Control of Current Populations**

Once an area with invasive plants has been identified, it is important to monitor and treat it regularly. This could mean mowing three times per season for roadside patches, or treating specific areas with an herbicide once per season.

While it would be ideal to strive for a weed-free gravel pit, it may be impractical. At a minimum, consider treating the section of the gravel pit from which you are actively hauling gravel. This will not eliminate invasive plant seeds, but it will reduce them substantially, making it much easier to manage invasives at sites where the gravel used. Some plants, such as Japanese knotweed, are a high priority for control and should be managed intensively. Other plants, like bull thistle, can be controlled just by mowing. A prioritized list of species for your township can be found in section C. Further explanation of control procedures can be found in sections E and F.

## C. Priorities

### 1. Prioritized Species List for the Township of Bayview

(See section E for detailed descriptions and photographs of the following plants.)

- a. **Japanese knotweed** – priority because it is in the early stages of invasion in our area, and its aggressive spread in ravine areas similar to those in the Sioux River and White River watershed
- b. **Leafy spurge** – priority because it is invading local pastures and hay/crop fields (as well as fallow fields), reducing acreage of productive land.
- c. **Dalmatian Toadflax** – priority because there is only a small amount of this plant in the area and therefore it may be possible to eradicate it.
- d. **Spotted knapweed** - priority because of its potential to spread into local pastures and hay/crop fields (as well as fallow fields), reducing acreage of productive land. Also priority because of its potential to reach the globally rare Pine Barrens. Barrens soils are ideal for this invasive plant, making it extremely difficult to control in this highly vulnerable ecosystem.
- e. **Purple loosestrife** – priority because it will dominate wetlands, replacing wildlife habitat along Lake Superior and on inland wetlands.
- f. **Canada thistle** - priority because of its quick spread, and because it is very difficult to control once established. Has potential to invade local fields being pastured or used for hay/crop production (as well as fallow fields), reducing acreage of productive land
- g. **Tansy** - priority because it is very difficult to control once established, and because of its potential to spread into local fields being pastured or used for hay/crop production, reducing acreage of productive land.
- h. **Honeysuckle** – priority because it will quickly invade nearby forests and replace the understory with a dense layer of honeysuckle, making the forests unsuitable for many wildlife species, including game species.
- i. **Glossy and Common Buckthorn** – priority because of its impacts on forest productivity, regeneration, and wildlife habitat. Often found in forests beyond the right-of-way, but should be controlled when found in roadsides.
- j. **Crown vetch** - non-native plant which can spread and replace native plants. Can also be difficult to eradicate once established.
- k. **Bull thistle** – non-native plant, should be controlled.

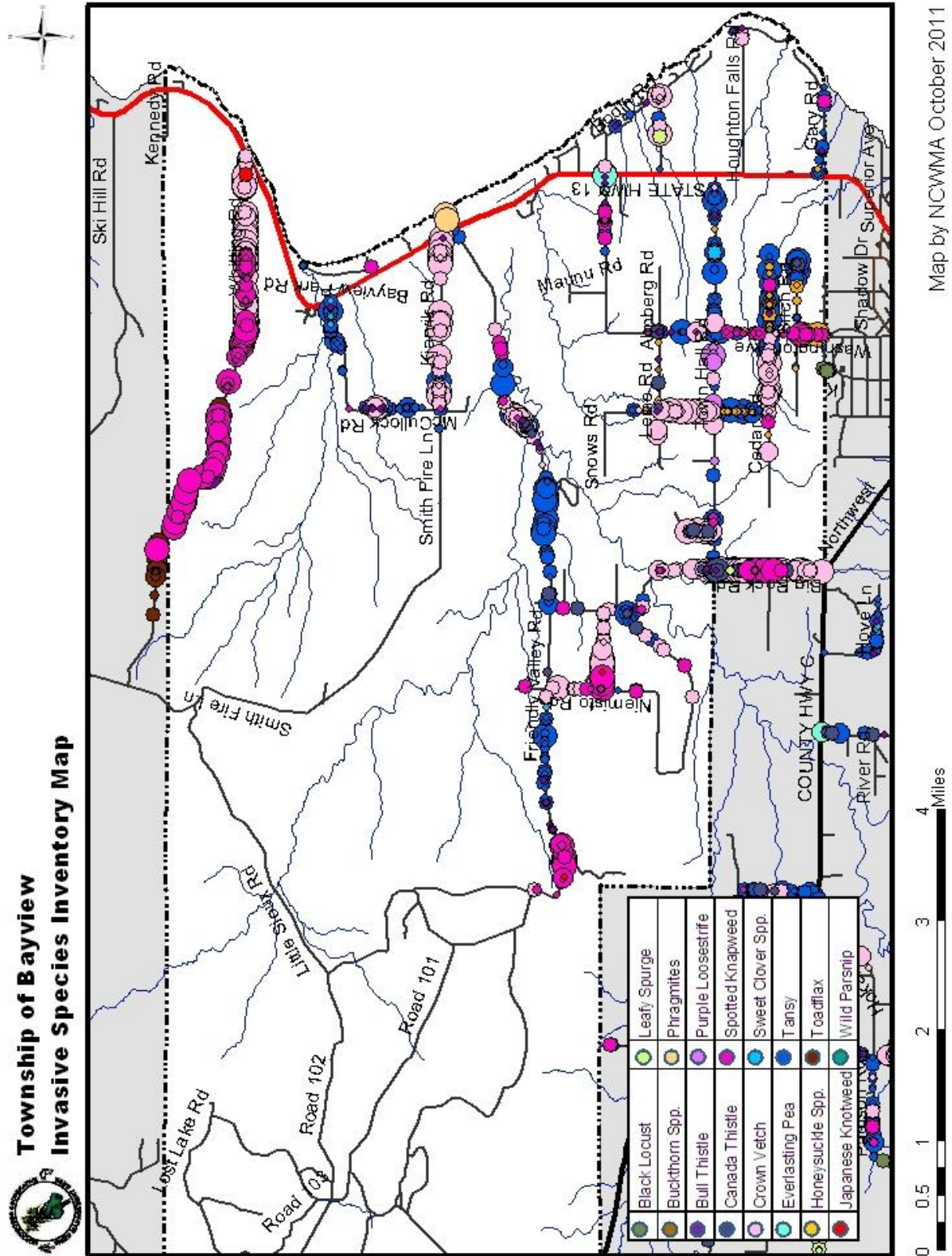
## 2. Trouble Spots for the Township of Bayview

This is a list of the densest areas of invasive plants that we found. These areas should be targeted for treatment first, and monitored to ensure treatment was effective. They are listed in order of importance.

- **Japanese Knotweed:** Very small patches are found on Whiting Rd. Because they are small, it is important to treat before it spreads.
- **Leafy Spurge:** Small patches are found on Big Rock Rd. and Bodin Rd.
- **Dalmatian Toadflax:** This is found intermittently along Whiting Rd. beginning near the County Forest boundary.
- **Spotted Knapweed:** Dense patches are found on Washington Ave., Big Rock Rd., and Whiting Rd.
- **Purple Loosestrife:** Dense patches are found on Town Hall Rd., Big Rock Rd., and Friendly Valley Rd.
- **Crown Vetch:** Dense patches are found on Whiting Rd., Kjarvik Rd., Komdorksi Rd., Friendly Valley Rd., and Mattson Rd.
- **Buckthorn:** Patches are found intermittently along Washington Ave and Peachy Rd.



## D. Map



## E. Species Information and Control Methods

www.nps.gov



### Japanese Knotweed

*Polygonum cuspidatum*

**Description:** Japanese knotweed is a tall, bamboo-like plant that grows up to 12 feet high, although its close relatives – Giant and Bohemian knotweed – can reach up to 15 feet high. It has reddish-green hollow stems that are jointed like bamboo, but are not woody. Knotweed has many red to green, slender branches growing upward

and outward. Dead plants remain upright or leaning during winter. Heart-shaped or oval leaves appear in spring with pointed tips and flat bases. Leaves can be 3-8 inches long and wide. In late summer, bunches of tiny white flowers emerge at the joint between the leaves and the stalks. Flowers yield numerous tiny, winged seeds.

www.nps.gov



**How and Where it Grows:** Japanese knotweed forms extremely dense patches, replacing native habitat with a towering stand of bamboo-like shoots with nothing growing beneath them. The shoots survive only one season while roots (called “rhizomes”) grow up to 65 feet long and can survive for decades. These roots send up hundreds to thousands of new shoots every spring. Although knotweed produces seeds, its primary means of reproduction is its extensive root system. The robust root system can grow through foundations, buildings, roads, pavement, and other structures. Japanese knotweed tolerates a wide range of growing conditions from full sun to shade, high salinity and drought, but prefers wet soils along streams and rivers. It also thrives in lawns and yards, especially in partly shaded areas. Japanese knotweed spreads along streams very quickly as the water carries roots, stem fragments and seeds to new areas. It spreads along highways and roads by similar means through routine mowing.

www.nps.gov



**History:** Japanese knotweed was originally introduced in the late 1800s as an ornamental plant, and is native to China, Japan, and Taiwan. It is considered an invasive in many parts of the world. Because of the damage it causes to foundations and pavement, some parts of Britain require removal of this species from residential properties before securing a mortgage. It is





classified as a Restricted species under Chapter NR 40 in our state.

**Look-a-likes:** Giant knotweed and bohemian knotweed are closely related, and both are highly invasive. The leaves and stems of giant knotweed are larger than Japanese knotweed, and Bohemian knotweed leaves have a more triangular shape than Japanese knotweed. However, treatment for these is the same as for Japanese knotweed.

### Management Recommendations

**Digging:** Manual control consists of digging out the rhizomes or cutting the stalks. However, digging is very labor intensive and tends to spread the rhizome fragments and promote disturbance and is not recommended.



**Cutting and Mowing:** If cutting or mowing is used, at least three cuts are needed in a growing season, because knotweed will vigorously re-sprout, often more densely than before. It is usually not effective to control knotweed with just cutting or mowing. In addition, because knotweed can spread by leaf or stem fragments, mowing a knotweed patch can spread the infestation if the equipment is not thoroughly cleaned.

**Herbicide:** For herbicide to be effective, it should be applied when knotweed is flowering, generally mid- to late-August. Glyphosate (RoundUp®) is not as effective on knotweed as Aminopyralid (Milestone VM®). Aminopyralid is selective to broad-leaved plants (it will not kill grass). However, if treating over standing water or wetlands, use an herbicide approved for the site such as imazapyr (Habitat®) or certain formulations of glyphosate (Rodeo®). Using a dye will help show which plants have been sprayed, which reduces the chance of spraying an area more than once, and ultimately decreases the amount of herbicide used. Read the herbicide label thoroughly prior to use. Regardless of which control method is used, if viable rhizomes remain in the soil, Japanese knotweed will return once management is relaxed. Treatment and monitoring of Japanese knotweed sites should be a long-term undertaking.

For foliar spraying (spraying the leaves to kill the plant), mix ½ ounce of Milestone® for every gallon of water in a backpack sprayer. The addition of a commercial herbicide surfactant (ex. Tactic®) mixed according to the label improves the efficacy of the herbicide by allowing it to stick to the leaves and circulate through the plant more effectively. Add dye. Spray the leaves to wet them, avoiding excess runoff or dripping.

For cut-stump treatment (cutting down the plant, then treating the remaining cut stem), use a solution that is half water and half glyphosate concentrate (ex. RoundUp®, Makaze® or Cornerstone®; use Rodeo® in wet sites). The final applied mixture should be at least 25% active ingredient, see the label to determine the concentration of active ingredient (glyphosate).



## Leafy Spurge

*Euphorbia esula*

**Description:** Leafy spurge grows 1-3 feet tall. The light blue-green leaves are pointed, long (1/2-1") and slender (1/4" or less across). They grow on a smooth, stiff single stem. The flowers are small, produced in loose heads, with a pair of bright yellow-green petals (called "bracts") at the base. Leafy spurge begins to flower in mid-June. Each flower develops a capsule containing three seeds. These capsules "shoot" open explosively when fully ripe, dispersing seed up to fifteen feet from the parent plant. Seed remains viable for 5-8 years in the soil. When the stem is broken, it oozes a milky white sap that is sticky. This is the best way to confirm the identity of leafy spurge.

**How and Where it Grows:** Leafy spurge is a perennial (same plant grows year after year from the same roots). In addition to spreading by seed, it also spreads from the root system, which is reported to reach over 20 feet into the ground, 20 feet across, and often has numerous shoots that are all part of the same root system. It is suspected that leafy spurge also produces its own herbicidal ("allelopathic") chemicals, which gives it an added advantage in competing against native plants for nutrients. It prefers loose, sandy or disturbed soil, making it especially problematic in crop or hay fields and roadsides.



Richard Old  
XID Services, Inc., Bugwood.org



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USDA Ag. Research Svc. – Retired  
Bugwood.org

**History:** Leafy spurge is native to central and southern Europe and to most of Asia. It was first reported in Massachusetts in 1827 and probably came from contaminated imported seed. By the early 1900s, leafy spurge was becoming a problem in the Midwest. Leafy spurge produces milky sap that irritates the mouth and digestive tract of livestock and some wildlife, though it is palatable to goats and sheep. This sap can cause a rash or blistering in humans.

**Look-a-likes:** Leafy spurge resembles another weed that is less invasive, known commonly as "butter-and-eggs" or "common/yellow toadflax" (*Linaria vulgaris*), but *Linaria* does not produce

white milky sap when broken. Cypress spurge is a close relative, and is also invasive. The flowers are very similar, but cypress spurge has a “fluffy” appearance from its many small, pointed, dense leaves. Control methods are the same as for leafy spurge.



**Cypress Spurge**

Steve Dewey, Utah State University, Bugwood.org



**Leafy Spurge**

USDA APHIS PPQ Archive



***Linaria vulgaris***

US Forest Service

## Management and Control Recommendations

**Hand Pulling:** Due to its extensive root system, digging and hand-pulling are rarely effective means of control.

**Herbicide:** Although a new herbicide called Perspective® has been found to be quite effective, it is not recommended for Bayview given the sandy soils and wet ditches (Perspective® cannot be applied over highly permeable soils or wetlands). However, another product called Plateau® is effective. Plateau® is most effective when applied in late fall. To prevent plants from setting seed before they are treated, it is best to mow them once during the growing season before they set seed (early July) and follow-up with a fall treatment. It is important to add a surfactant to herbicide used on leafy spurge so the product does not drip off the leaves. The addition of a commercial herbicide surfactant (ex. Tactic®) mixed according to the label, improves the efficacy of the herbicide by allowing it to stick to the leaves and circulate through the plant more effectively. Using a dye will help show which plants have been sprayed, which reduces the chance of spraying an area more than once, and ultimately decreases the amount of herbicide used. Read the entire herbicide label for other restrictions prior to use!

Plateau must be obtained through an herbicide distributor or natural resource agency. To obtain Plateau, contact the Northwoods CWMA at [info@northwoodscwma.org](mailto:info@northwoodscwma.org). The Northwoods CWMA conducts leafy spurge control in partnership with landowners each fall using Plateau (much of this work takes place nearby in the town of Washburn).





Leslie J. Mehrhoff

## Spotted Knapweed

*Centaurea biebersteinii*

**Description:** Spotted knapweed is a perennial (same plant grows year after year from the same roots) that grows 1-4 feet tall with pale, grayish-green leaves covered in fine short hairs. Leaves get progressively smaller toward the top. The main stem is stiff, hairy and branching. First-year plants do not flower, but have a small dandelion-like “rosette” of leaves that grow close to the ground (see photo below). It has pink or purple thistle-like flowers. The flowers resemble tiny pineapples topped with a showy ring of pinkish purple, thin petals; the tips of the scales covering the pineapple-like base (called “bracts”) are dark, giving it the spotted look for which the plant is named. Each plant can produce 400 or more seeds per flower stalk. Most seeds fall within a 3-4 foot radius of the parent plant, unless they become attached to wildlife or livestock, hay or commercial seed, or vehicles.



Top Left: first-year leaf “rosette” (Linda Wilson)

Bottom Left: flowering plant (Steve Dewey, bugwood.org)

Center: leaves (Ohio State Weed Lab Archive)

Right: flowers (University of Idaho Archive)

**How and Where it Grows:** Spotted knapweed reproduces by seed. Seeds germinate in the fall and early spring, and may be viable for up to eight years. Because of the longevity of the seeds, it is important to continue monitoring at disturbed sites, as described in section B. Once a seed starts to grow, it spends the first year growing a long tough taproot, waiting until after its first year to start flowering. Plants may flower only once, or up to three years in succession, and perennial plants may have up to 20 flowering stems. Spotted knapweed can tolerate a wide range of soil depth, soil moisture, and temperature, but seems to prefer sunny areas with sandy or disturbed soils such as roadsides, dry fields, and pine barrens. Spotted knapweed is an especially

aggressive invasive because it is *allelopathic*, meaning it produces a chemical that inhibits the growth of other plants nearby. This chemical, called catechin, is secreted by the roots of spotted knapweed and has been shown to stop germination and growth of some native plants, grasses, and crops such as wheat.

**History:** Spotted knapweed is a native of Europe and western Asia, originating from central and southeast Europe, northern Italy, and central Russia. Spotted knapweed is a member of the Aster family, and is related to dandelions, sunflowers, goldenrod, and other asters. It is classified as a Restricted species under Chapter NR 40.

**Look-a-likes:** Flowers resemble thistles, but the plant is not spiny or prickly and does not grow as tall as thistles. Relatives of spotted knapweed – brown knapweed and meadow knapweed (both non-native) – have larger, darker purple flowers, and brown scale tips instead of black. Control methods for brown knapweed and meadow knapweed are the same as for spotted knapweed.

### Management Recommendations

**Hand Pulling:** If caught early enough, a small area of spotted knapweed can be removed by hand-pulling or digging with a spade. In denser areas, repeated spot-burning is more effective and efficient. Gloves should be worn when hand-pulling.

**Herbicide:** For herbicide to be effective, it should be applied during the growing season while the plants are actively growing. The best time to spray spotted knapweed is just before it flowers when there are buds on the plants. It can be hard to find patches of knapweed before the plants begin to flower, so you may opt to wait until a few plants have started to flower before you begin spraying. However, it is best to treat as soon as possible once you begin to see flowering plants.

Glyphosate (ex. RoundUp®, Makaze®) is ineffective for treating spotted knapweed. The most effective chemical currently available is aminopyralid (trade name Milestone VM®), which is a selective herbicide that does not harm grasses when applied correctly. Apply with a backpack sprayer, using just enough spray to wet the leaves but avoiding excessive dripping. The addition of a commercial herbicide surfactant (ex. Tactic®) mixed according to the label, improves the efficacy of the herbicide by allowing it to stick to the leaves and circulate through the plant more effectively. Using a dye will help show which plants have been sprayed, which reduces the chance of spraying an area more than once, and ultimately decreases the amount of herbicide used. Do not use Milestone VM over open water. Read the entire herbicide label for other restrictions prior to use!

For Milestone VM, use 1 teaspoon per 1 gallon of water, or approximately 1 tablespoon for a 3-gallon backpack sprayer (0.13% solution). Always read herbicide labels thoroughly prior to use.

# Purple Loosestrife

*Lythrum salicaria*

**Description:** Purple loosestrife is a hardy perennial that can grow 4-8 feet tall. The leaves often grow in pairs opposite one another on the stem, though not always (sometimes they are alternate). The best way to distinguish purple loosestrife is to check for the square stem. The flowers are bright purple, growing on dense spikes that develop at the stem tips. Purple loosestrife blooms in late July to early August. There are hundreds of small flowers on the 8-18 inch flower spike. A single plant may produce over 2.5 million tiny seeds per year. Plants are long lived and seeds can remain viable in the soil for several years. Seeds float and can be carried long distances in rivers, streams, and ditches.



**How and Where it Grows:** Purple loosestrife is a perennial (same plant grows year after year from the same roots) that grows in wetlands, along stream banks, shorelines of shallow ponds, and in swampy areas along roadsides. Purple loosestrife reproduces primarily by seed, although new shoots can develop from detached sections of roots. Seeds require warm temperatures and moist open soils for germination. Seedlings grow rapidly and can flower in their first year. Mature plants develop sturdy root stocks that grow outward from the plant, and can produce more than thirty new shoots per year. Established purple loosestrife plants can tolerate a broad spectrum of growing conditions including permanent flooding, low water and nutrient levels, and low pH.



Steve Dewey



John D. Byrd



John D. Byrd

**History:** Purple loosestrife was brought to the United States from Europe as an ornamental and medicinal plant, and spread rapidly. Impacts on wildlife have not been well studied; however, purple loosestrife appears to reduce waterfowl and aquatic fur bearer activity severely, and reduces the ability of native plants to take in nutrients. Purple loosestrife can form dense stands which choke out native species on which wildlife depend. It is an NR 40 Restricted species.

**Look-a-likes:** Purple loosestrife is often mistaken for other similar plants. The most common is a native wildflower called fireweed, which has bright-pink flowers in a loose flower spike and grows in drier soils. The flowers of fireweed are much larger than those of loosestrife, with 4 wide petals on each flower. Blue vervain is another native wildflower confused with loosestrife.



Blue vervain has branching flower spikes with very small, dark blue-purple flowers mostly at the tip. The leaves of blue vervain have toothed edges, whereas loosestrife leaves are smooth on the edges. Another look-a-like is lupine (aka big-leaf lupine, *Lupinus polyphyllus*) whose flowers bloom much earlier than loosestrife (early June versus August). The leaves of lupines are *palmate*, meaning many leaves extend from a central point similar to fingers extending in all directions from a *palm* (see photo).



**Blue vervain**  
wildflower.org



**Fireweed**  
Royal Time Images, Inc.



**Lupine**  
Emmet J. Judziewicz

## Management Recommendations

**Hand Pulling:** For small infestations, hand pulling can eliminate purple loosestrife. However, the plant will re-sprout if the entire root is not removed. Continued hand-pulling will prevent it from regenerating from seed, and may eventually kill the plant. Frequent mowing may be effective if cut stems dry rapidly. Mowing may help contain the spread of loosestrife by preventing it from flowering and producing seed. Mowing will not kill it and is NOT recommended once flowers are present (note that viable seeds may be present on the plant while the plant is flowering).

**Herbicide:** Several herbicides are available for control of purple loosestrife; however, since it mostly grows in or near water, the herbicide used must be safe for aquatic ecosystems. Examples include Rodeo®, Garlon 3A®, and Renovate®. A permit from the Wisconsin DNR is required to apply herbicide over standing water. Check with the Wisconsin DNR before spraying purple loosestrife growing in standing.

**Biological Control:** In its natural habitat in Europe, purple loosestrife is not wildly invasive because it is eaten by leaf-feeding beetles (*Galerucella californiensis*, and *G. pusilla*), among other insects and herbivores. These leaf-feeding beetles were brought to the U.S., run through rigorous testing to ensure they wouldn't harm our ecosystem, kept under observation for several years, and finally released in the wild to help control loosestrife in our country. They generally tolerate our climate in northern Wisconsin, they disperse on their own to find new loosestrife patches, and they reproduce on their own, making them a cost-effective option for control. To obtain beetles for loosestrife in your town, contact the Northwoods CWMA.



(Mary Ellen [Mel] Harte)

## Canada Thistle

*Cirsium arvense*

**Description:** Canada thistle is perennial (grows back year after year from the same roots) that grows up to 5 feet tall. The stem and leaves are dark green, with a lighter green stripe running down the center of each leaf. Leaves are 3-12 inches long, curly on the edges, with spines at the tips and edges. Unlike bull thistle, the leaves of Canada thistle are not hairy. Flowers develop at the top of the plant. Canada thistles bloom from late June to August. The light-purple (occasionally pink) flower heads are approximately 1/2 inch in diameter. In early fall, the flowers “puff” like a dandelion, and the wind can spread the seeds.



Seeds (Richard Old)



Leaves (Leslie J. Mehrhoff)



Infestation in bloom  
(Alec McClay)



Infestation going to seed  
(UAF Cooperative Extension Archive)

**How and Where it Grows:** Canada thistles can invade almost any type of disturbed area, such as forest clearings, pastures, and roadsides. It tolerates open sun and partial shade, dry soils and moist soils, although it will not grow in standing water. Plants often form very dense thickets, choking out other wildflowers, grasses, and forage crops. The spiny, prickly nature of Canada thistle makes it inedible for most wildlife and livestock, and reduces the forage quality of pastures and hay fields.

**History:** Canada thistle is native to Europe and Asia and was accidentally introduced to North America in the 1600s. It is classified as a Restricted species.

**Look-a-likes:** Bull thistle, another introduced species, may be mistaken for Canada thistle. Bull thistles have larger flowers and typically grow as a single plant, while Canada thistle often grows in dense patches. The flowers of spotted knapweed look very similar to those of Canada thistle, but spotted knapweed does not have spines on its leaves.



Canada thistle (Mary Ellen [Mel] Harte)



Bull thistle (Forest & Kim Starr)



Spotted Knapweed  
(University of Idaho Archive)

## Management Recommendations

**Hand Pulling:** Canada thistle is difficult to remove by hand. Its spines are painful and require sturdy leather gloves to handle. Also, it has a very extensive root system. Very small plants (less than 12 inches) can be dug up, but larger plants are difficult to completely remove, and are likely to regrow from root fragments left behind.

**Mowing:** Plants in the flower bud stage may be mowed to prevent seed spread, but mowing will not kill Canada thistle. When mowed, Canada thistles may regrow and bloom later. To prevent this, mow 2-3 times per summer (if this is the only control method being used). Plants should be cut June through early August before seeds mature, and cut as low to the ground as possible.

**Herbicide:** For herbicide to be effective, it should be applied while the plants are actively growing. Glyphosate (RoundUp®) is not very effective on Canada thistle, although it will stunt its growth during the season in which the herbicide is applied. Aminopyralid (Milestone VM®) is effective in controlling thistles. Aminopyralid is selective to broad-leaved plants (it will not kill grass), and so it can be used in areas where native grasses are intermingled with the target plants. Do not use it over standing water or wetlands. The addition of a commercial herbicide surfactant (ex. Tactic®) mixed according to the label improves the effectiveness of herbicide by allowing it to stick to the leaves and circulate through the plant more effectively. Using a dye will help show which plants have been sprayed, which reduces the chance of spraying an area more than once, and ultimately decreases the amount of herbicide used. Read the herbicide label thoroughly prior to use.

Recent studies show that treating in early fall (September) is most effective. For Milestone VM, use  $\frac{3}{4}$  teaspoon per 1 gallon of water, or 2 teaspoons per 3-gallon backpack sprayer (0.09% solution).



# Tansy

*Tanacetum vulgare*

**Description:** Tansy is a perennial (grows back year after year from the same roots) that reaches 2-4 feet tall. It has lacy, fern-like, dark-green leaves, along a stiff, sometimes reddish stem. The leaves have a strong, pungent smell (somewhat like Lysol or Vick's VapoRub) when crushed or mowed. The flowers are round, flat-topped, button-like, yellow heads that bloom from mid- to late-summer. The flowers resemble a cluster of daisies without petals. Seed heads resemble the flowers, but they are brown. Seeds are easily spread by wind and water.

Steve Dewey



Flowers (Richard Old)



New plants with last year's stalks  
(Steve Dewey)



Field infestation (Steve Dewey)

**How and Where it Grows:** A tansy infestation begins with a few plants that spread outward in a circle as the roots grow each year, eventually leading to very dense patches. Tansy prefers sunny, disturbed areas such as roadsides, fields, and abandoned construction areas.

**History:** Native to Europe and Asia; brought to the United States as an ornamental and medicinal plant. In Europe, tansy historically was used to treat a wide variety of ailments such as worms, fevers, bad skin, and measles. It was also used as an herb to induce miscarriages, and reportedly has an abortive effect on livestock. The leaves and flowers are toxic to people and livestock if consumed in large quantities; the volatile oil contains toxic compounds, which can cause seizures, and liver and brain damage. It can also irritate skin. It has been shown to be an effective insect repellent when crushed and rubbed on clothing. It is classified as a Restricted species under Chapter NR 40.

## Management Recommendations

**Hand Pulling and Digging:** Small patches of tansy can be hand-pulled or dug up with a spade. Plants are easiest to pull after they have bolted (a long stem has grown), but before they flower. Moist soil is best for hand-pulling or digging the roots. Use gloves for hand pulling.

**Mowing:** Mowing twice per season can help control tansy, although it will not kill it. Ideally, mowing should occur in early summer, before or just after it flowers, and again in the late summer to knock back any re-growth or new flowers. This will prevent it from going to seed.

**Herbicide:** For herbicide to be effective, it should be applied while the plants are actively growing. Glyphosate (RoundUp®, Makaze®) is somewhat effective on tansy, but will require multiple treatments; a chemical called Imazapyr (Habitat®) is very effective on tansy, and is approved for use over wet areas. Mix the herbicide according to the label directions and apply with a backpack sprayer before or during the flowering stage. Use just enough spray to wet the leaves but avoid excessive dripping. The addition of a commercial herbicide surfactant (ex. Tactic®) mixed according to the label improves the effectiveness of herbicide by allowing it to stick to the leaves and circulate through the plant more effectively. Using a dye will help show which plants have been sprayed, which reduces the chance of spraying an area more than once, and ultimately decreases the amount of herbicide used. Read the herbicide label thoroughly prior to use.

For glyphosate (ex. RoundUp®, Makaze®), use 5 tablespoons per one gallon of water, or 1 cup per 3-gallon backpack sprayer (2% solution). For best results, add ½ teaspoon of dish soap per gallon, or use a commercial surfactant mixed according to the label directions. Do not apply glyphosate over wetlands or standing water unless you are using a formulation specifically approved for such use (ex. Rodeo®). Always read the herbicide and surfactant labels thoroughly prior to use.

For Imazapyr (Habitat®), mix ¼ cup per gallon of water, or ¾ cup for a 3-gallon backpack sprayer (1.5% solution). Habitat® is approved for use over wetlands or standing water. Always read the herbicide and surfactant labels before use.



# Honeysuckle

*Lonicera spp.*

**Description:** There are several different types of honeysuckles that look very similar. They grow from 3-12 feet tall, and have oval, greyish-green leaves that grow in pairs opposite from one another on the stem. A key way to tell if a shrub is an invasive honeysuckle is to check the stems. Invasive honeysuckles have a small hollow core in the stem, even when very small. The bark of honeysuckle shrubs is light grey-brown, ropy-looking, and on larger shrubs is often peeling near the base. In early summer, honeysuckles are covered with small, sweet-smelling flowers. The flowers are white, light pink, or dark pink. In late summer, the flowers turn into bright red, orange, or yellow berries that grow close together in groups of two or three. The berries are attractive to birds, which eat and then disperse the seeds.

Flowers (Leslie J. Mehrhoff)



Leaves and berries (Rob Routledge)



Opposite leaves (Chris Evans)

**How and Where it Grows:** Honeysuckles are common in fields, lawns, forest edges, and floodplains. They can tolerate full sun and shade.



Large flowering honeysuckles  
(Richard Webb)



Small plants with berries  
(Chris Evans)



Dense Infestation  
(Patrick Breen)

**History:** Honeysuckles were brought to the United States as ornamental plants from Asia in the late 1700s and early 1800s. They were once promoted as a wildlife-friendly species in Wisconsin because the bright berries attract birds. However, it has been recognized as an invasive non-native species for decades because of how it quickly spreads and replaces other understory plants. It is classified as a Restricted species under Chapter NR 40.

**Look-a-likes:** The non-native invasive honeysuckle species slightly resemble the native bush honeysuckles, but the native species have much smaller, yellow flowers and shiny, reddish leaves with sharply pointed tips. The seeds of native bush honeysuckles remain small and hard and do not turn into brightly colored berries. Native honeysuckles are also much smaller than invasive honeysuckles, reaching only 2-4 feet tall compared to the much larger invasive shrubs.



Native honeysuckle (wildflower.org)



Native honeysuckle (wildflower.org)



Invasive honeysuckle (Richard Old)

## Management Recommendations

**Hand Pulling or Cutting:** Manual pulling and digging can control small plants and small populations when all of the roots are removed; these are best to do when soil is moist. However, hand removal of honeysuckle is very labor intensive, and is only effective if nearly all the roots are removed. When cut down and left untreated, honeysuckles will vigorously re-sprout from the stump, creating a dense hedge.

**Herbicide:** Glyphosate (ex. RoundUp ® or Rodeo®) and triclopyr (ex. Garlon®) are both effective for honeysuckle, although triclopyr is generally more effective. Both products can be purchased in different formulations, only some of which are safe to use over water or wetlands (ex. Rodeo® and Garlon 3A®). If you will be adding a surfactant and spraying over water or wetlands, be sure to use a surfactant that is also approved for aquatic sites. Using a dye will help show which areas have been sprayed. Read the herbicide label thoroughly prior to use.

There are two methods for treating shrubs with herbicide: *cut-stump* and *foliar* application. *Cut-stump* treatment begins by cutting the plant less than 6” inches off the ground, then spraying the cut surface with a very small amount of highly-concentrated herbicide. This method is generally best for plants with a stem more than a ½-inch across. Alternatively, *foliar* applications involve spraying the leaves of the plant (or foliage, hence “foliar application”) while it is actively growing, typically April-October for honeysuckle. Foliar applications require far more herbicide, but at a much lower concentration. This method is generally best for young small shrubs.

Foliar application: use ¾ cup of concentrated herbicide (glyphosate or triclopyr) per gallon of water (4.5% solution). Add surfactant based on label recommendations, and mix with dye.

Cut-stump application: use herbicide full strength, or dilute 1:1 with water (25-55% active ingredient, depending on the size of the plants being treated). Mix in 1-quart batches or less, this method uses very little herbicide. Add surfactant based on label recommendations, and mix with dye.



## Glossy Buckthorn and Common Buckthorn

*Frangula alnus* (formerly *Rhamnus frangula*) and  
*Rhamnus cathartica*



Glossy buckthorn. Stephen Solheim



Common buckthorn. [www.nps.gov](http://www.nps.gov)

**Description:** Glossy and common buckthorn grow 3-20 feet high. They have dark green leaves that are oval; glossy buckthorn leaves have smooth edges whereas common buckthorn leaves have small teeth on the edges. Buckthorn leaves stay green and cling to the branches well into late fall, long after most other leaves have fallen, making it easy to find and identify in autumn. The bark of glossy buckthorn is dark brown or dark grey and speckled with light-colored spots called *lenticels*, similar to the bark of speckled alder a.k.a. “alder brush.” Glossy and common buckthorn have a bright orange cambium layer just beneath the surface of the bark. This can be seen by scraping the surface of the bark to confirm proper identification. The flowers are barely noticeable, but its berries (on female plants only – not all buckthorn plants will have berries!) are black or red and roughly the size of a blueberry. Berries appear in late summer or early fall. Although common buckthorn has small stout thorns, glossy buckthorn does *not* have thorns like its name would suggest.

**How and Where It Grows:** Glossy buckthorn grows in areas where soil is moist at least part of the year such as alder swamps, but also does well in dry areas like fence rows and old fields. It tolerates full sun and partial shade. Common buckthorn grows in open and shaded areas, but prefers dry or slightly moist soils (not too wet). Buckthorn forms dense thickets of seedlings, which eventually choke out native understory plants including tree seedlings.

**History:** Buckthorn is native to most of Europe, and it grows in west and north Asia. Buckthorn is found throughout most of the eastern and mid-western states. It was brought to the U.S. for use in hedges, forestry uses, and wildlife habitat. It is classified as Restricted under Chapter NR 40.

**Look-a-likes:** Black cherry (*Prunus serotina*) can easily be confused with glossy buckthorn, but black cherry leaves are more pointed at the tip with tiny teeth on the edges, whereas glossy buckthorn leaves are oval-shaped and completely smooth on the edges.

### Management Recommendations



**Hand-pulling:** Seedlings or small plants may be hand-pulled or removed with a shovel, while larger plants may be pulled out with heavy equipment. This is easiest to do when the soil is moist.

**Cutting:** Repeated cutting reduces plant vigor, but cutting must be followed by herbicide treatment or the cut stumps will vigorously re-sprout, sending up numerous small shoots. Mowing maintains open areas by preventing seedling growth.

**Girdling:** Removing the bark in a 12"-wide band around the trunk to interrupt the flow of water and nutrients can kill most buckthorn plants. The cambium (soft layer beneath the bark) must be completely removed all the way around the trunk. Girdling does not disrupt the soil, and does not disturb nearby plants or soil, making it a good option for isolated plants in ecologically-sensitive areas, or on private yards if a homeowner prefers not to use chemicals. Cut the bark as low to the ground as possible so the plant is not able to resprout below the girdled portion. In the event of resprouts, use a foliar herbicide application.

**Herbicide:** Glyphosate (ex. RoundUp® or Rodeo®) and triclopyr (ex. Garlon®) are both effective for buckthorn, although triclopyr is generally more effective and can be used year-round. Both products can be purchased in different formulations, only some of which are safe to use over water or wetlands (ex. Rodeo® and Garlon 3A®). If you will be adding a surfactant and spraying over water or wetlands, be sure to use a surfactant that is also approved for aquatic sites. Using a dye will help show which areas have been sprayed. Read the herbicide label thoroughly prior to use.

There are two methods for treating shrubs with herbicide: *cut-stump* and *foliar* application. *Cut-stump* treatment begins by cutting the plant less than 6" inches off the ground, then spraying the cut surface with a very small amount of highly-concentrated herbicide. This method is generally best for plants with a stem more than a ½-inch across. Alternatively, *foliar* applications involve spraying the leaves of the plant (or foliage, hence "foliar application") while it is actively growing, typically April-October. Foliar applications require far more herbicide, but at a much lower concentration. This method is generally best for young small shrubs.

Foliar application: use ¾ cup of concentrated herbicide (glyphosate or triclopyr) per gallon of water (2-5% solution). Add surfactant based on label recommendations, and mix with dye.

Cut-stump application: use herbicide full strength, or dilute 1:1 with water (25-55% active ingredient, depending on the size of the plants being treated). Mix in 1-quart batches or less, this method uses very little herbicide. Add surfactant based on label recommendations, and mix with dye.



Dave Powell, USDA Forest Service, Bugwood.org

## Crown Vetch

*Coronilla varia*

**Description:** Crown vetch has a creeping stem reaching 6 to 12 feet in length. The leaves range from 1 to 3 inches in length, and have numerous small leaves on a main stem. The leaves have a water-resistant coating on them, which causes water to form small beads on the leaves. The flowers are circular or “crown” shaped. Flowers are pink with some white and appear in late May-August. Flowers become small (1/2 to 1 inch) pea-like “pods,” with 6 to 12 seeds inside. Seeds remain viable in the soil for several years, requiring consistent post-treatment monitoring.



Dan Tenaglia, MissouriPlants.com, Bugwood.org

**How and Where it Grows:** Crown vetch spreads by seed and through underground roots (“rhizomes”). The perennial roots anchor the plant and serve as a storage structure for nutrients. Flowers emerge May through August and seeds will mature by September. Crown vetch is primarily found along roadsides, fields, and road cuts. It does well in most habitats from rocky dry sites to moist well-drained areas. It does not like full shade but will grow in sparse shade along the edge of forested areas. It grows throughout Wisconsin and most of the United States.



James H. Miller, US Forest Service, Bugwood.org

**History:** Crown vetch is a member of the Pea family. This low growing vine was commonly used throughout the United States for erosion control, roadside planting and crop rotation. Crown vetch is toxic to horses; it contains a chemical compound called *nitroglycosides*. If consumed in large amounts, it can cause slow growth, paralysis, or death. Crown vetch is native to Europe, Asia and Africa. It has been widely cultivated as a ground cover and for erosion control in the U. S. since the 1950’s. It has become naturalized in much of the U.S. and southern Canada. In some areas, crown vetch will totally dominate pastures and abandoned fields.



Richard Old, XID Services, Inc., Bugwood.org

**Look-a-likes:** Crown vetch may be confused with other vetches and non-native plants in the Pea family, such as hairy vetch. However, the circular “crown” shape of the flower heads is unique to this species.

## Management Recommendations

**Hand Pulling:** Hand pulling can be effective for mature plants when controlling small initial infestations, as long as the roots are fully removed. Disturbed areas should be re-seeded with a non-invasive seed mix.

**Mowing:** Plants in the bud stage (just before flowering) can be mowed to reduce the chance of further spread. Mowing should occur 2-3 times per summer to control spread. Plants should be cut before seeds mature (June through early August) and as low to the ground as possible..

**Herbicide:** For herbicidal controls to be effective, herbicides should be applied while the plants are actively growing. Aminopyralid (ex. Milestone VM®) and Clopyralid (ex. Transline®) have been shown to be effective in controlling crown vetch. Aminopyralid is selective to broad-leaved plants (it will not kill grass when applied according to label specifications). Do not use Milestone over or near water. Apply with a backpack sprayer, using just enough spray to wet the leaves but avoiding excessive dripping. The addition of a commercial herbicide surfactant such as Tactic® (mixed according to the herbicide label) improves the effectiveness of treatments on crown vetch by breaking through the water-resistant cuticle on the leaves. Using a dye will help show which plants have been sprayed, which reduces the chance of spraying an area more than once, and ultimately decreases the amount of herbicide used. Read the herbicide label thoroughly prior to use.

For Milestone VM, use 1 teaspoon per 1 gallon of water, or approximately 1 tablespoon per 3-gallon backpack sprayer (0.13% solution). For best results when treating crown vetch, use a commercial surfactant according to the label directions. Always read the herbicide and surfactant labels thoroughly prior to use.



Darienne McNamara

## Bull Thistle

*Cirsium vulgare*

**Description:** Bull thistle is a biennial (lives for two years) that grows 4 to 7 feet tall. The stem and leaves are thick, spiny, and dark-green. Leaves are 3-12 inches long, pointed, spiny at the tips, and very hairy. In the first year, the plant forms a “rosette” (see photo). Second-year plants “bolt,” growing a tall flowering stalk that goes to seed. Flowers develop at the top of the plant. Bull thistles bloom from June to September. The purple flower heads are large, up to 2 inches in diameter. In early fall, the flowers “puff” like a dandelion.



First-year ‘rosette’ of leaves (Michael Shephard)



Stem and leaves (Dan Tenaglia)



Seed ‘puff’ (Forest & Kim Starr)

**How and Where it Grows:** Bull thistle invades almost any type of disturbed area, such as forest clearings, pastures, and roadsides. It typically grows as a single plant or in small groups of 2-5 plants, rarely forming large patches. It prefers full sun, but can also grow in semi-shaded areas. The spiny, thorny leaves and stem of the plant make it inedible for most wildlife and livestock, and reduces the forage quality of pastures and hay fields.

**History:** Bull thistle is native to Europe, western Asia, and northern Africa. It is thought to have been introduced to the eastern United States during colonial times and spread to the western United States in the late 1800s. It is currently found in all 50 states.

**Look-a-likes:** Canada thistle, which is also invasive, may be mistaken for bull thistle. See page 14 for a complete description.

### Management Recommendations

**Hand Pulling:** Hand-pulling or digging is an effective control method for bull thistle. If enough of the taproot is removed, they will not grow back. If the plant is already flowering, be sure to bag and dispose of the flower, as it may still develop into viable seed even after it has been severed from the roots.

**Mowing:** Plants in the flower bud stage can be controlled with mowing. With repeated mowing each season, they will eventually die back. Plants should be cut before seeds mature (June through early August) and as low to the ground as possible.

**Herbicide:** Same as for Canada thistle, see page 14.

## F. Summary of Best Management Practices (BMPs)

These BMPs are taken from the *Invasive Species Best Management Practices for Transportation and Utility Rights-of-Way Manual* published by the Wisconsin Council on Forestry and the Wisconsin Department of Natural Resources in 2009. The full 63-page text is available on the internet at <http://council.wisconsinforestry.org/invasives/transportation/> and contains further descriptions, considerations, and suggestions for each BMP.

### 1. Soil Disturbance BMPs

#### Planning

- BMP SD 1: Prior to implementing right-of-way activities, scout for, locate and document invasive species infestations.
- BMP SD 2: Consider the need for action based on: 1) the degree of invasiveness; 2) severity of the current infestation; 3) amount of additional habitat at risk for invasion; 4) potential impacts; and, 5) feasibility of control with available methods and resources.
- BMP SD 3: Plan activities to limit the potential for introduction and spread of invasive species, prior to construction.
- BMP SD 4: Provide appropriate resources for identification of local invasive species for workers.

#### Activities

- BMP SD 5: Minimize soil disturbance, which may include using existing roads, access points, staging areas and alternative construction.
- BMP SD 6: Avoid invasive species populations when feasible and minimize the spread of invasive species during activities that require soil disturbance.
- BMP SD 7: Prior to moving equipment into an uninfested area or out of an infested area, clean soils, seeds, plant parts, or insects from exterior surfaces to the extent practical.
- BMP SD 8: Stabilize disturbed soils as soon as possible.
- BMP SD 9: Use non-invasive cover crops or native seed for revegetation.

### 2. Vegetation Management and Inspection/Monitoring BMPs

#### Planning

- BMP VM 1: Prior to implementing right-of-way activities, scout for, locate and document invasive species infestations.
- BMP VM 2: Plan activities to limit the potential introduction and spread of invasive species, prior to construction.
- BMP VM 3: Assess current available resources and seek new resources to prevent invasive species spread.
- BMP VM 4: Provide training in identification, control and prevention of known invasive species to employees and contractors performing vegetation management.

#### Activities

- BMP VM 5: Prior to moving equipment into an uninfested area or out of an infested area, clean soils, seeds, plant parts, or insects from exterior surfaces to the extent practical.
- BMP VM 6: Inspect and clean clothing, footwear and gear for soils, seeds, plant parts, and insects before and after activities.
- BMP VM 7: Carefully dispose of soils, seeds, plant parts or insects found during inspection and cleaning.
- BMP VM 8: Locate and use staging areas that are free of invasive plants to avoid spreading seeds and other viable plant parts (ex. root fragments).
- BMP VM 9: Consider the likely response of invasive species when conducting activities that result in disturbed soil, increased sunlight, fire, etc.
- BMP VM 10: Ensure that control methods are done within the appropriate time window.
- BMP VM 11: Monitor ROW's during day-to-day activities and post-management activities; determine necessary treatments based on presence of invasive species.

### **3. Transport of Materials BMPs**

#### Planning

- BMP TM 1: Take steps to avoid moving invasives to non-infested areas.
- BMP TM 2: Prior to transporting materials, manage the load to limit the spread of invasive species.

#### Activities

- BMP TM 3: Prior to moving equipment into an uninfested area or out of an infested area, clean soils, seeds, plant parts, or insects from exterior surfaces to the extent practical.
- BMP TM 4: Dispose of soils, seeds, plant parts or insects found during inspection and cleaning.
- BMP TM 5: Establish staging areas and temporary facilities in locations that are free of invasives.
- BMP TM 6: Use soil and aggregate material from sources that are free of invasive species.
- BMP TM 7: Manage stock piles to limit the spread of invasive species.
- BMP TM 8: Do not transport woody material that may contain invasive species (ex. Emerald Ash Borer).
- BMP TM 9: If you must transport woody material that may contain invasive species, bring them to a designated area for appropriate disposal.
- BMP TM 10: Keep and reuse onsite materials rather than importing new materials.

### **4. Revegetation and Landscaping BMPs**

#### Planning

- BMP RV 1: Plan activities to limit the potential introduction and spread of invasive species, prior to revegetation.

BMP RV 2: Select non-invasive or native species for revegetation and landscaping activities.

#### Activities

BMP RV 3: Inspect and clean clothing, footwear and gear for soils, seeds, plant parts, or insects before and after activities.

BMP RV 4: Prior to moving equipment into an uninfested area or out of an infested area, clean soils, seeds, plant parts, or insects from exterior surfaces to the extent practical.

BMP RV 5: Revegetate disturbed soils as soon as possible to minimize invasive species establishment.

BMP RV 6: Where site conditions permit, allow natural revegetation to occur.

BMP RV 7: Ensure the species specified in the plan are the ones being used.

BMP RV 8: Monitor the revegetation site.

## **G. Summary of Chapter NR 40**

NR 40 is a Wisconsin rule administered by the Department of Natural Resources that, among other things, classifies invasive species as Prohibited or Restricted and regulates the transportation, possession, transfer, and introduction of those species. The major purpose of the rule is to educate people in Wisconsin about invasive species, and the actions they can take to minimize their spread and the damage they cause. The full text of the bill can be seen on the internet at <http://dnr.wi.gov/invasives/classification/>.

### **1. Definitions of key terms:**

Invasive species – species or “varieties” that are not native to Wisconsin and that cause, or are likely to cause, economic or environmental harm or harm to human health.

Prohibited invasive species – not currently found in Wisconsin, or are only found as small infestations, but which, if introduced into the state, are likely to cause significant harm.

Restricted invasive species – already well-established in the state; known to cause, or have the potential to cause, significant harm.

Introduce – release an invasive species into the environment.

Possess – own, maintain control over, restrain, hold, grow, raise or keep. Landowners “posses” plants growing on their property.

Transfer – buy, sell, trade, barter, exchange, give or receive, or to offer to do any of these.

Transport – cause, or attempt to cause, an invasive species to be moved within the state. This includes importation.

Reasonable precautions – actions that prevent or minimize the transport and introduction of invasive species. Reasonable precautions include BMP's approved by the WDNR.

## **2. Major points of the rule:**

- Unless there is a specific exemption or a permit has been issued under the rule, no one may transport, transfer or introduce a Prohibited or Restricted invasive species. No one may possess any Prohibited species or any Restricted fish.
- It is not a violation if the department reasonably determines that the conduct was incidental or unknowing, and was not due to the person's failure to take *reasonable precautions* (defined above, includes BMPs from Section F of this plan).
- The rules allow the transport of Prohibited and Restricted invasive species for the purpose of identification, control or disposal. The location of Prohibited species must be reported to the WDNR.
- The rules also require preventive measures or limit certain common activities that may function as pathways for the inadvertent introduction or spread of invasive species. Examples include several measures that are intended to prevent the introduction of invasive aquatic species, and prohibiting the transportation of an identified carrier of an invasive species from a quarantine area or infestation control zone, such as moving firewood or ash trees from an area known to have Emerald Ash Borer.
- The rules include authority to enter lands for the purpose of inspection, sampling and control of Prohibited invasive species; allow the department to order landowners to implement control measures, and allow for state control at the landowner's expense if the landowner is unable or unwilling to comply and is determined to be at fault for the introduction.
- Not all invasive species have been assessed and classified at this time. Many are pending assessment. Other species (primarily plants) that are known to be invasive are administratively listed as "non-restricted" and are not regulated under the rules because of their economic value.

## **3. Classification Criteria and Requirements**

Invasive species are classified into the following four categories: (a) Prohibited, (b) Restricted, (c) Caution, and (d) Non-restricted. Only species in the Prohibited and Restricted categories are listed in NR 40. Species are classified based on the following criteria:

- The potential to directly or indirectly cause economic or environmental harm or harm to human health.
- The extent to which it is already established in the state, or in portions of the state.
- The likelihood that, upon introduction, it will become established and spread in the state.



- The potential for eradicating or controlling its spread, including the technical and economic feasibility of eradication or control.
- The socio-economic value afforded by the species, including any beneficial uses or value it may provide for recreation, commerce, agriculture or industry.

### **Prohibited Category**

- **Actions Prohibited:** No person may import, transport, possess, transfer or introduce a Prohibited invasive species. Landowners technically “posses” plants growing on their property.
- **Control Requirements:** (a) Unless the lands are public, if the WDNR has reason to believe a prohibited species is on a property, they may enter for inspection or control only with permission or an inspection warrant. (b) If the prohibited species population is deemed reasonable and feasible to control, the WDNR may ask any person who owns, controls or manages land to control the Prohibited species in accordance with a plan approved by the department. The WDNR will seek funds to assist in the control. However, the landowner/manager is ultimately responsible for the control. (c) If voluntary cooperation is not achievable or likely, the WDNR or its designee may control or order the control of the species. If the department determines that the landowner/manager is at fault for the presence of the prohibited species, the department may recover expenses incurred for control.
- **Exemptions:** (a) Persons are allowed to transport a Prohibited invasive species for the purpose of identification, control or disposal without a permit, provided that the person reports the location of the Prohibited invasive species to the WDNR. (b) It is not a violation if the department reasonably determines that the conduct was incidental or unknowing, and was not due to the person’s failure to take reasonable precautions.

### **Restricted Category**

- **Actions Prohibited:** No person may import, transport, transfer or introduce a Restricted invasive.
- **Control Requirements:** Any person who grows a Restricted plant at a nursery shall make a good faith effort to destroy it upon closure of the nursery.
- **Exemptions:** (a) Persons are allowed to transport a Restricted invasive species for the purpose of identification, control or disposal without a permit. (b) No permit is required for persons to transport, transfer or introduce parts of a Restricted plant species that are incapable of reproducing or propagating. (c) It is not a violation if the department reasonably determines that the conduct was incidental or unknowing, and was not due to the person’s failure to take reasonable precautions.

## H. Appendices

### 1. List of Further Resources

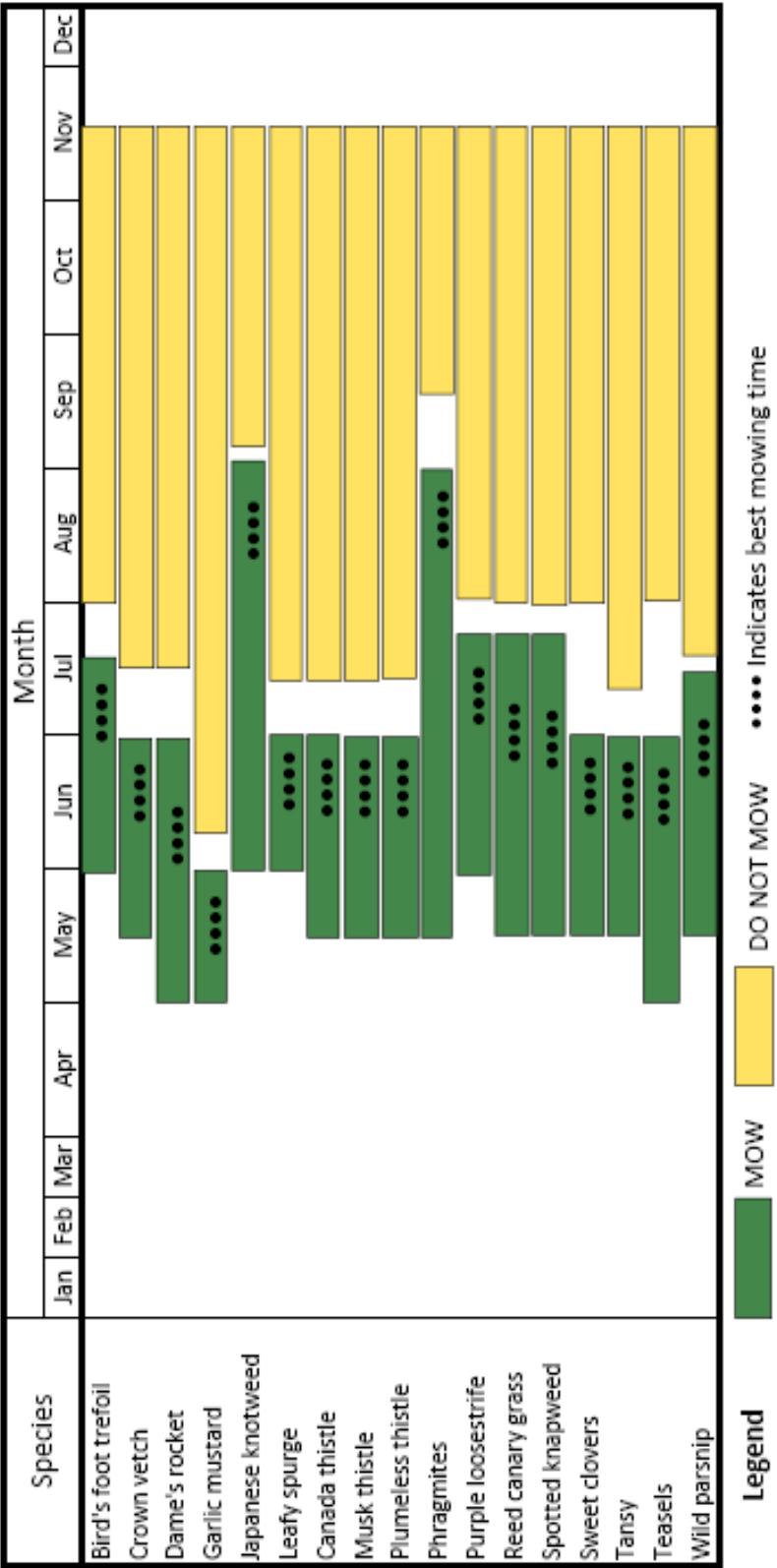
- a) **Northwoods Cooperative Weed Management Area** – local network of professionals and citizens working to protect the northwoods of Wisconsin from invasive species, and educate people about their impacts. Can provide:
- technical assistance regarding plant identification, site-specific and species-specific control recommendations, and much more through an extensive network of professionals around the region
  - tools and equipment available for loan through the community tool shed
  - brochures and fact sheets regarding invasive plants in our area
  - contact information for local professionals working with invasive plants
  - assistance finding and writing grants for local groups and municipalities
  - website with information specific to rights-of-way managers, as well as information for homeowners in northern Wisconsin

The Coordinator can be reached at [info@northwoodscwma.org](mailto:info@northwoodscwma.org), or visit their website at [www.northwoodscwma.org](http://www.northwoodscwma.org) for more information.

- b) **Online Weed ID Tool** – find out which species you have using this online plant key designed for the amateur. Go to <http://weedid.wisc.edu/weedid.php>.
- c) **Invasive Plant Atlas** – online resource with numerous photos and other information about invasive plants. Go to [invasiveplantatlas.org](http://invasiveplantatlas.org).
- d) **Material safety data sheets (MSDS) and product labels** – free up-to-date versions are available for most herbicides online at [cdms.net](http://cdms.net) under Services.

2. Mowing guide

Mowing times for common invasive species in northern Wisconsin



### 3. Seed mix guide

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\*\* Note that common names and scientific names are provided. *Please check scientific names when you purchase seeds.* Common names vary among different distributors and locations. Some invasive species are sold under different common names, but the scientific name should always be the same.

#### **Recommended Species:**

- Oats (*Avena sativa*)
- Canada Wildrye (*Elymus canadensis*)
- Annual Rye (*Lolium multiflorum*)
- Big Bluestem (*Andropogon gerardii*)
- Little Bluestem (*Schizachyrium scoparium*)
- Red Fescue (*Festuca rubra*)
- White Clover (*Trifolium repens*)
- Red Clover (*Trifolium pratense*)

#### **Species to AVOID when seeding:**

- Bird's Foot Trefoil (*Lotus corniculatus*)
- Crown Vetch (*Coronilla varia*)
- Hairy Vetch (*Vicia villosa*)
- Cow vetch (*Vicia cracca*)
- Reed Canarygrass (*Phalaris arundinacea*)
- White Sweet Clover (*Melilotus officinalis*)
- Yellow Sweet Clovers (*Melilotus alba*)

#### **WI DOT seed mixes preferred:**

- 10
- 20
- 40
- 60
- 70
- 70A
- 75 (erosion)
- 80 (salt tolerant)

#### 4. Sample inventory / monitoring / treatment form

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### COLLECTION INFORMATION

State \_\_\_\_\_ County \_\_\_\_\_ Date observed \_\_\_\_\_  
Collector name \_\_\_\_\_  
Street address \_\_\_\_\_ City \_\_\_\_\_ Zip \_\_\_\_\_  
Phone \_\_\_\_\_ Email \_\_\_\_\_

### CHARACTERISTICS & LOCATION

**Plant name** (Common and/or Latin name)

\_\_\_\_\_

**Size & density of infestation.** Describe spread and estimate numbers

\_\_\_\_\_

**Habitat description.** Describe general habitat type such as forest interior, forest edge, old field, prairie, wetland, lakeshore, crop field, pasture, disturbed ground, urban setting type. Is it public or private land?

**Location landmarks.** Provide enough details so site can be found again. Note nearby landmarks such as city name, roads, intersections, driveways, lake edges and other natural and cultural features.

**Geographic coordinates** (Complete one.)

1. Latitude \_\_\_\_\_ N Longitude \_\_\_\_\_ W

2. UTM \_\_\_\_\_ E \_\_\_\_\_ N

3. Township, Range, Section, Part Section

\_\_\_\_\_