



**ILLINOIS
LANDOWNER'S
GUIDE TO
INVASIVE PLANTS**





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Herbicide Safety Statement

Herbicides are a very useful tool in managing non-native invasive species. However, herbicides can be hazardous to humans, wildlife, plantlife, and the environment as a whole if used improperly. The Illinois Forestry Association recommends that you always use pesticides properly and safely by following the pesticide label. To ensure that you are using an herbicide product safely, always read the entire pesticide label to be aware of proper use and necessary safety precautions.

You, as a pesticide applicator are always responsible for any herbicide misuse. Pesticide labels are legally enforceable. It is illegal to use the products in any manner that is inconsistent with its label. This is yet another good reason to read the entire label and to understand a pesticide's proper use.

This guide makes herbicide recommendations for various invasive species, including type of herbicide and rates. The herbicide rate recommendations made represent commonly available formulations of herbicide. To find out the proper rates for a specific formulation of herbicide, always check the product label.

INTRODUCTION

Why Are Non-native
Invasive Plants Such a
Big Deal?

What is a Non-native Invasive Plant?

A non-native invasive plant is any plant outside its native range that causes significant negative impact to native species or natural ecosystems.

Why Do They Cause So Much Harm?

Non-native invasive plant species tend to take space and light away from native species. Illinois' worst invasives have competitive advantages over native species because of biological characteristics like shade tolerance, aggressive resprouting capabilities, deep and dense seed banks, and voracious seed dispersal capabilities. Since non-native invasives are from other locations in the world, nature here does not yet have natural checks to keep these invasives from aggressively spreading and expanding their ranges. This spread of invasive plants causes severe harm to native trees, forbs, native insects and wildlife. Entire ecosystems are under threat of severe loss of biodiversity.

For example, Illinois' most common forest type is a forest that is dominated by oaks and hickories. The spread of non-native invasive species can severely hinder an oak-hickory forest's ability to naturally regenerate trees. This can rapidly change the species composition of Illinois forests, potentially causing a ripple effect on Illinois wildlife, insects, and even recreational activities for people. As such, the spread of non-native invasive plants has far-reaching negative impacts to the forests of Illinois.

What Can I Do As a Landowner?

Avoid planting any of these species. Introducing these plants could result in an infestation on your land. Instead, try planting native species that are often visually appealing as well as beneficial to wildlife.

What If I Have Invasives On My Land?

Control non-native invasive species as soon as you can to prevent further spread. There are multiple control methods for invasive plants. Different control methods work for different species, so it is important to do your research and follow resources like this guidebook and others to learn how to take the right steps.

How Do I Control Infestations?

- » Positively identify the invasive plant
- » Monitor and assess the invasive population
- » Remove or treat the invasive species
- » Take precautions to prevent further spread of population
- » Continue to follow up with repeated monitoring and control

Methods to Control Non-native Invasive Plants



Manual and Mechanical Control

Manual and mechanical control methods can be very effective depending upon the species of plant and extent of infestation.

Manual Control - Hand pulling or digging up individual invasive plants.

- » Only successful if you remove the invasive plants' root system from the soil.
- » Most effective on shallow rooted plants.
- » Tends to be more effective during the beginning stages of infestation.

Mechanical Control - Using machinery to mow, bush hog, weed-whip, grind, chip, or cut invasive plants.

- » Effective on dense infestations.
- » In many cases, mechanical control is most effective when used in combination with chemical control methods.
- » If using heavy machinery, extreme caution should be taken to avoid soil compaction or further spread of invasive seed.
- » Heavy machinery should be cleaned after use to prevent spread of invasives.



Hand pulling can be very effective in controlling shallow-rooted garlic mustard



Forestry mulching can be the most cost effective option when dealing with woody invasives like autumn olive

Cultural Control - Prescribed Fire

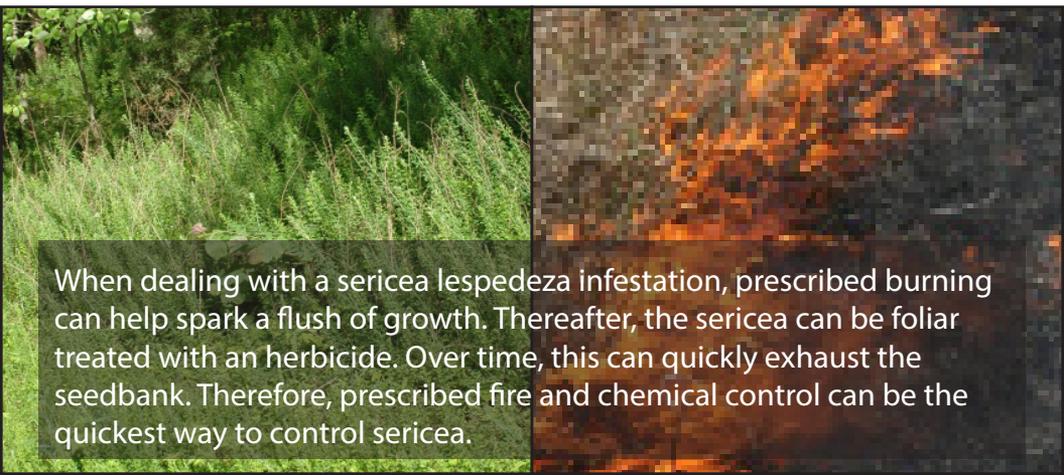
Prescribed fire can be a very useful tool in dealing with many non-native invasive species.

Prescribed Fire - Using a controlled application of fire in a forest or grassland to utilize the management benefits of fire.

- » Can kill invasives
- » Can help promote native communities of vegetation
- » Should always be carried out under the supervision of a professional forester

Some invasive species can be stimulated by fire, including Japanese stiltgrass, garlic mustard, tree of heaven, oriental bittersweet, princess tree, and sericea lespedeza. This can create more of a problem without a follow-up herbicide treatment. However, when used with a follow-up herbicide treatment, this method can be one of the fastest ways to exhaust seed banks and eradicate infestations.

Timing is crucial when using fire as a management tool. Make sure to consult with a forester before attempting this control method.



When dealing with a sericea lespedeza infestation, prescribed burning can help spark a flush of growth. Thereafter, the sericea can be foliar treated with an herbicide. Over time, this can quickly exhaust the seedbank. Therefore, prescribed fire and chemical control can be the quickest way to control sericea.

Chemical Control

Chemical control is often the most effective method in managing non-native invasive plants. However, when dealing with the use of herbicides, safety is always the number one priority.

Herbicides can be used in a variety of different application methods. There are also many different types of herbicides that can be used to control invasives. However, these different herbicides and application methods have differing effects on different invasive plants. For this reason, the pesticide label should always be read in full to determine an herbicide's effectiveness.

Herbicides have differing risk potential. When not used properly, some herbicides pose greater risk to the applicator as well as the environment as a whole. Read the entire pesticide label to learn about these risks.

The proper protective wear should always be worn when applying herbicides. This can include chemical resistant gloves, protective eyewear, pants, long sleeves, and even masks. This information can be found on the pesticide label.

You, as the applicator are responsible for any misuse of an herbicide you are applying. Make sure that you are using any product responsibly and safely. The best way to ensure that you are using the product responsibly and safely is to read the entire pesticide label.



Chemical Control Methods

Foliar Spraying

Foliar Application - Spraying a relatively dilute formulation of herbicide solution on the foliage of a plant.

- » Herbicide solution should evenly cover the surface area of the foliage, but do not spray to the point of runoff
- » Most effective when the plant is actively photosynthesizing (temperatures above 60 degrees fahrenheit)
- » The plant must have a healthy leaf canopy

Foliar applications can be a useful tool in managing non-native invasive plants. Some sprayers that could be useful for this technique include high volume sprayers, as well as backpack sprayers. It is crucial to apply full coverage of the herbicide to the full canopy of the target's foliage. Spray nozzles should be adjusted to allow for a wide mist of spray rather than a concentrated jet. Too much herbicide applied could result in runoff of the herbicide, which could lead to non-target impact. Dyes can be added to the herbicide to help the applicator know when full coverage of the foliar canopy is achieved. The efficacy of many herbicides can be enhanced through additives, such as a non-ionic surfactant.

Non-native invasive plants over 6 feet tall should not be treated with this technique. Applicators should avoid spraying herbicide upwards into the air to avoid hazardous herbicide drift. Spraying upwards into the air can be hazardous to the sprayer as well as surrounding native plants.



Foliar spraying can be a great method to control garlic mustard.

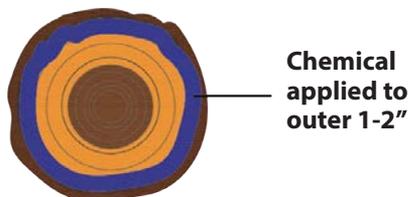
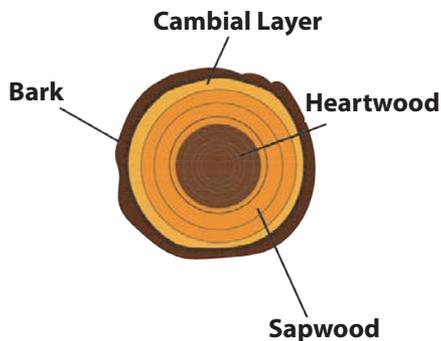
Chemical Control Methods

Cut Stump Treatment

Cut Stump Application - Severing the stem of an invasive and treating the stump with a more concentrated systemic herbicide.

- » Very effective on most woody invasives
- » Must cut the stem of the plant
- » Herbicide should be applied to the outer 1-2" of the cut surface. For smaller stems, treat the entire surface.
- » Most effective when herbicide is applied within 15 minutes after cutting
- » Requires tools like a chainsaw or loppers, as well as a hand chemical sprayer

Cut stump treatments can be a great tool to eradicate woody invasives. The first step is to safely sever the stem of the invasive, exposing a stump. A systemic herbicide should then be applied to the outer 1-2" of the stump within 15 minutes after the cut to prevent the stump from forming new sprouts. Applying herbicide to the exposed cambial layer on the stump will transfer the herbicide to the roots. Stumps should ideally be 3-6 inches tall. Adding a dye can help the applicator be sure to get full coverage over the cambium layer of the stump.



Cut stump treatments are particularly effective when controlling autumn olive too tall to treat with foliar spraying

Chemical Control Methods

Basal Bark Treatment

Basal Bark Application - Applying herbicide to the bark on the stem of an invasive plant, covering the bottom 15 inches of the stem.

- » Very effective on most woody invasive species with thin bark
- » Must apply to all sides of the stem
- » Must apply to the bottom 15 inches of the stem
- » If treating multi-stem shrubs, treat all stems
- » Backpack sprayers are most suitable for this method

Basal bark treatments are a useful technique to eradicate woody invasives. Ester-based triclopyr formulations in oil are often the most suitable herbicides for this method. Applicators should apply herbicide to the bottom 15 inches of the stem. The herbicide should cover the full circumference of the stem. When treating multi-stemmed shrubs, all of the stems should be treated. The plant will uptake the herbicide through its bark and translocate the herbicide to the roots, killing the plant.

The advantage of controlling invasives with the basal bark method is that it takes the work of cutting down woody plants completely out of the equation. This method can be carried out year round, but is most effective in the fall. This method should not be attempted if ice or silt is present on the stem. When comparing this method to cut stump treatments, it should be noted that this method of control tends to require more herbicide.



Basal bark treatments can be useful to control bush honeysuckle.

Identification and Control of Non-native Invasive Plants





Amur Honeysuckle
(Lonicera maackii)



The Problem with Amur Honeysuckle

Amur honeysuckle was once considered a beneficial ornamental. Private landowners were advised to plant this species for its benefits to wildlife and erosion control. However, that narrative has changed in the forestry community. Today, amur honeysuckle is considered one of our more serious forest health challenges. This species can be found all throughout Illinois. It has severely infested our forested natural communities and has displaced native vegetation. For this reason, forest management professionals agree that this non-native invader should be managed from Illinois forests.

Identification Characteristics

Plant: Upright, woody shrub, 10' - 15' tall.

Leaves: Simple, opposite leaf arrangement, 1-3" long, ovate, green top, pale green bottom. Leaves tend to stay green longer than other species in the fall.

Bark: Light tan in color, bark stringy and peeling (especially on larger stems)

Twig: Thin, hollow.

Flowers: May-June, white/yellow flowers

Fruit: Red berries arranged in pairs at the base of the leaves.

Control of Bush Honeysuckle

Mechanical Control: Hand pulling small, young plants can be effective when soil is moist enough.

Chemical Control: Amur honeysuckle can be managed through the use of foliar treatments, basal bark treatments, or cut stump treatments.

Foliar - For foliar treatments, apply glyphosate to all foliage of plants under 5' - 6' tall. Spraying upward is hazardous and not advised.

Basal Bark - Apply a triclopyr ester formulation around the circumference of the lowest 15 inches of the stem. Basal bark applications may not yield as consistent control as other methods presented.

Cut Stump - Apply glyphosate to the exposed stump, making sure to cover the living outer tissue of the stump.





Autumn Olive
*(**Eleagnus umbellata**)*



The Problem with Autumn Olive

Autumn olive was once advertised as a beneficial ornamental to provide food and habitat to wildlife. Unfortunately, today we are dealing with the consequences of introducing this non-native invasive plant to our environment. It can spread very rapidly and dominate the understory of Illinois forests, especially young forests or tree plantings. Since it displaces important native vegetation, forest managers agree that it should be controlled. However, autumn olive can aggressively resprout when cut, which makes herbicide treatments a crucial step in control attempts.

Identification Characteristics

Plant: Upright, multi-stemmed woody shrub, 10' - 20' tall.

Leaves: Simple, alternate leaf arrangement, 3" long, ovate, green top, silver bottom. "Glimmering" silver underside is a helpful identification tool.

Bark: Gray, furrowed bark on main stem and mature plants. Younger stems are silverish-brown.

Twig: Grayish-silver, slender, lateral stems can be pointed like thorns.

Flowers: April-May, small, pale yellow flowers.

Fruit: Red drupes with silvery scales.

Control of Autumn Olive

Mechanical Control: Autumn olive root very deep in the ground. Heavy machinery is needed to remove individuals. Using forestry mulchers is effective when paired with follow-up herbicide treatment.

Chemical Control: Autumn olive can be controlled through the use of foliar treatments, basal bark treatments, or cut stump treatments.

Foliar - Apply triclopyr to all foliage of plants under 5' - 6' tall. Spraying upward is hazardous and not advised.

Basal Bark - Apply a triclopyr ester formulation around the circumference of the lowest 15 inches of the stem.

Cut Stump - Apply glyphosate or a triclopyr ester formulation to the exposed stump, making sure to cover the living outer tissue of the stump.

Note: Picloram and imazapyr are also effective as cut stump and basal bark applications for autumn olive, but care should be taken when using these herbicides near desirable tree species.





Common Buckthorn
(Rhamnus cathartica)



The Problem with Common Buckthorn

Common buckthorn is native to Europe and West Asia. It was introduced to the United States as an ornamental in the 1800s. Common buckthorn grows in dense hedges that shade out native vegetation. It is a very hardy species, able to grow in a variety of soils and lighting conditions. This species can invade native communities in oak-hickory forests and prairies. It can commonly be found at the edge of roads and fields. Birds and other wildlife easily spread seed from the dark purplish - black berries. Because of this species' ability to shade out native plants, efforts should be made to control it.

Identification Characteristics

Plant: Upright, woody shrub/small tree, grows up to 20' tall.

Leaves: Simple, opposite or nearly so (sometimes alternate) leaf arrangement, oval shaped, small serrations at leaf margin, 1-3" long, green top, light green bottom. Leaves stay green until late fall.

Bark: Gray - brown with lenticels (raised pores), dark orange color to inner bark.

Twig: Many twigs are pointed like thorns, 1/4" - 1" long.

Flowers: May-June, small umbels, greenish-yellow flowers.

Fruit: Small dark purple - black drupes.

Control of Common Buckthorn

Mechanical Control: Small plants can be hand pulled from moist soil. Larger plants can be pulled using a grubbing tool. Remove full root crown.

Chemical Control: Common buckthorn can be controlled through the use of foliar treatments, basal bark treatments, or cut stump treatments.

Foliar - Apply triclopyr amine in water to all foliage of plants under 5' - 6' tall. Spraying upward is hazardous and not advised.

Basal Bark - Apply a triclopyr ester formulation around the circumference of the lowest 15 inches of the stem.

Cut Stump - Apply triclopyr amine in water or glyphosate formulation to the exposed stump, making sure to cover the living outer tissue of the stump.





Callery Pear
(*Pyrus calleryana*)

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The Problem with Callery Pear

Callery pear is a tree native to China. It was first brought to the United States for purposes of hybridizing with common pear to improve disease resistance. It eventually grew in popularity as an ornamental tree and was widely available for landscaping. Cultivars of these trees were considered sterile. However, other cultivars created began cross-pollinating and reproducing. Birds spread seed by eating the fruit and carrying it great distances. This tree tolerates a variety of soil and light conditions. Today it has begun spreading to natural areas where it can displace native vegetation and continue to spread. For this reason, it should be controlled and avoided for landscaping use.

Identification Characteristics

Plant: Tree, medium sized, showy color in fall.

Leaves: Simple, alternate arrangement, oval shaped, 3" long.

Bark: Gray - brown, smooth when young, scaly when mature.

Twig: May have thorns, buds large, gray, and fuzzy.

Flowers: Early spring, white flowers, grow in clusters, 5 petals, foul odor.

Fruit: Round fruit, light brown with pale dots, hard.

Control of Callery Pear

Mechanical Control: Small seedlings can be hand pulled from moist soil.

Cultural Control: Prescribed fire alone is not effective. It may be effective in combination with herbicide treatment.

Chemical Control: Callery Pear can be controlled through the use of foliar treatments, basal bark treatments, or cut stump treatments.

Foliar - Apply glyphosate or triclopyr in water to all foliage of plants under 5' - 6' tall. Spraying upward is hazardous and not advised.

Basal Bark - Apply a triclopyr ester formulation mixed with basal oil around the circumference of the lowest 15 inches of the stem (plants 4" in diameter or below).

Cut Stump - Apply triclopyr amine in water or glyphosate formulation in water to the exposed stump, making sure to cover the living outer tissue of the stump.





Multiflora Rose
(Rosa multiflora)



The Problem with Multiflora Rose

Multiflora rose, a plant native to East Asia was introduced to the United States in 1866. It was promoted as a useful plant for erosion control as well as use as a "natural fence". Eventually, its rapid spread potential was recognized. Today, multiflora rose can be found throughout much of the Eastern United States growing in dense thickets. Multiflora rose can invade natural communities of forests, outcompeting native vegetation. Multiflora can spread rapidly when its abundant fruit is eaten by birds and dispersed.

Identification Characteristics

Plant: Upright, multi-stemmed shrub (can behave as a vine), can grow 10' - 15' tall.

Leaves: Compound, alternate leaf arrangement, 7 - 11 leaflets, oval shaped, serrated leaf margin, 1" long.

Stems: Green - reddish stems, thorns with wide base (curved backwards).

Flowers: May-June, abundant white flowers with 5 petals, green sepals, yellow stamens.

Fruit: Small red hips.

Look Alikes: Feathery margin on narrow stipules distinguish multiflora rose from other native rose species (shown in bottom right photo).

Control of Multiflora Rose

Mechanical Control: Can be cut with a chainsaw or brush cutter.

Cultural Control: Fire can kill seedlings, but other plants will likely resprout.

Chemical Control: Multiflora rose can be controlled through the use of foliar treatments, basal bark treatments, or cut stump treatments.

Foliar - Apply glyphosate, triclopyr, 2,4-D, or 2,4-D + triclopyr in water to all foliage of the plant.

Basal Bark - Apply a triclopyr ester formulation in basal oil around the circumference of the lowest 15 inches of the stem.

Cut Stump - Apply glyphosate or triclopyr in water to the exposed stem stumps, making sure to cover the living outer tissue of the stump.

Note: Picloram and imazapyr are also effective herbicides for multiflora rose, but care should be taken when using these herbicides near desirable tree species.





Princess Tree
(Paulownia tomentosa)

The Problem with Princess Tree

Princess tree is native to China. It was brought to the United States around the 1830s for its medicinal and timber value. Today, this tree has naturalized and invaded much of the Eastern United States. It can tolerate a variety of growing conditions. These trees can grow and spread rapidly, often invading disturbed areas in forests, roadsides, and streambanks. Wind and water carry and spread the seed from princess tree great distances from the parent tree. It can also reproduce from root sprouts. Since princess tree can invade natural areas, it should be controlled if found on your property.

Identification Characteristics

Plant: Tree, can grow 30' - 50' tall.

Leaves: Simple, opposite leaf arrangement, heart shaped, large, 5"-12" long.

Bark: Grayish-brown, small fissures.

Twigs: Light brown, lenticels.

Flowers: Mid-spring, purple flowers, large, grow in clusters, 1.5" - 2" long, fragrant.

Fruit: Oval capsules, 1" long, green initially, turns brown and dry.

Control of Princess Tree

Mechanical Control: Seedlings can be pulled by hand from moist soil.

Cultural Control: Fire may stimulate further spread of princess tree. It is not considered an effective control method.

Chemical Control: Princess tree can be controlled through the use of foliar treatments, basal bark treatments, and cut stump treatments.

Foliar - Apply glyphosate in water or triclopyr in water to all foliage of the plant.

Basal Bark - Apply a triclopyr ester formulation mixed with basal oil around the circumference of the lowest 15 inches of the stem (6" in diameter or less).

Cut Stump - Apply glyphosate or triclopyr amine in water and apply to stump within 15 minutes of cutting.





Privet

(Ligustrum spp.)



The Problem with Privet

There are several species of privet. Privet is native to Europe, Asia, and Africa. Many different varieties of this species were brought to the United States as a hedge plant for landscaping. The species that are known to naturalize in Illinois are border privet (*Ligustrum obtusifolium*) and common privet (*Ligustrum vulgare*). These two species can be challenging to tell apart. Therefore, this handbook will describe common characteristics of both species. Privet has become a major issue in more southern states. In order to prevent further spread of this non-native invader, Illinois private landowners should control this plant when discovered.

Identification Characteristics

Plant: Upright, multi-stemmed woody shrub, can grow 4' - 15' tall.

Leaves: Simple, opposite leaf arrangement, ovate and oblong, smooth leaf margin, 1" - 3" long, green top, pale green bottom.

Bark: Gray, smooth, raised lenticels.

Twigs: Gray when mature, light brown when young, often pointy at tip (thorn-like).

Flowers: May-June, small white flowers, 4 petals, (trumpet-like shape).

Fruit: Blueish-black berries.

Control of Privet

Mechanical Control: Can be cut with a chainsaw or brush cutter. (Could be impractical due to sharp thorn-like twigs)

Cultural Control: Fire can kill seedlings, but other plants will likely resprout. Fire could be effective if followed up by an herbicide treatment.

Chemical Control: Privet can be managed through the use of foliar treatments, basal bark treatments, or cut stump treatments.

Foliar - Apply glyphosate in water or triclopyr in water to all foliage of the plant.

Basal Bark - Apply a triclopyr ester formulation mixed with basal oil around the circumference of the lowest 15 inches of the stem.

Cut Stump - Apply glyphosate in water to the exposed stem stump, making sure to cover the living outer tissue of the stump.





Tree of Heaven
(Ailanthus altissima)

The Problem with Tree of Heaven

Tree of heaven, an invasive native to China, can be detrimental to native vegetation. There are many factors that make this tree a problematic invasive. For starters, tree of heaven is allelopathic. This means that the tree produces chemicals in its leaves, bark, and roots that discourage the establishment of other plants around the tree. Tree of heaven also behaves as a clonal species, meaning it has the potential to sprout colonies of separate stems from a single root system. The tree also thrives in multiple soil conditions. All these factors make tree of heaven a serious invasive issue.

Identification Characteristics

Plant: Clonal tree, can grow 40' - 80' tall.

Leaves: Pinnately compound, alternate arrangement, lance or wing shaped, smooth leaf margin, 1'- 3' long, "raised teeth" at bottom.

Bark: Light gray - dark gray (light brown - greenish when young), ridges, the texture has been compared to "cantaloupe skin".

Twigs: Greenish-brown, no terminal bud, spongy pith (exposed when broken).

Flowers: Late spring, greenish-yellow flowers in panicles

Fruit: Samaras

Note: The smell of the leaves has been compared to rancid peanut butter.

Control of Tree of Heaven

Mechanical Control: Repeated mowing small plants could be effective. Mature, clonal species should not be felled to avoid aggressive resprouting.

Cultural Control: Fire could kill seedlings, but other plants will likely aggressively sprout, often making the infestation worse.

Chemical Control: Tree of heaven can be controlled through the use of foliar treatments and basal bark treatments.

Foliar - Apply glyphosate in water or triclopyr in water to all foliage of the plant.

Basal Bark - Apply a triclopyr ester formulation mixed with basal oil around the circumference of the lowest 15 inches of the stem. Larger trees should be girdled (herbicide applied in cut).

Stem Injections - Stem injections of triclopyr or imazapyr is a good option for larger trees. Follow label directions for rates and number of injections needed.





Winged Burning Bush
(Euonymus alatus)



5481

The Problem with Winged Burning Bush

Winged burning bush is known for being a popular shrub to plant in your yard. They turn a vibrant red in the fall, which probably contributes to their popularity. However, this non-native invasive is escaping our yards and invading natural areas. It has serious spread potential because of how popular it has become as an ornamental. Birds easily spread the seed to natural areas, where the plant can seriously dominate and outcompete native vegetation. This shrub tolerates varying soil and light conditions. It should be removed and replaced in landscaping to prevent further spread.

Identification Characteristics

Plant: Single and multi-stemmed woody shrub, 4' - 12' tall

Leaves: Simple, opposite arrangement, elliptic shaped, finely serrated, 1"- 3" long, densely foliated.

Bark: Dark brown with light brown ridges, 2 - 4 corky wings on younger stems may be present.

Twigs: Green, corky wings.

Flowers: Early summer, yellowish-green, small, bunches of 3 or less, appear at leaf base.

Fruit: Dark red seed capsules.

Control of Winged Burning Bush

Mechanical Control: Plants can be hand pulled out of moist soil.

Cultural Control: Fire could kill seedlings (not as effective on mature plants).

Chemical Control: Winged burning bush can be eradicated through the use of foliar treatments, and basal bark treatments.

Foliar - Apply glyphosate in water to all foliage of the plant.

Basal Bark - Apply a triclopyr ester formulation mixed with basal oil around the circumference of the lowest 15 inches of the stem.

Cut Stump - Apply glyphosate in water to the exposed stump, making sure to cover the living outer tissue of the stump.





Japanese Honeysuckle
(*Lonicera japonica*)



The Problem with Japanese Honeysuckle

Japanese Honeysuckle is one of our most widespread non-native invasives in Illinois. It was brought over from East Asia and was promoted as a beneficial ornamental for erosion control and wildlife. This aggressive vine can overtake native forbs, shrubs, and even trees. This species forms a dense wall of foliage that intercepts light from shaded plants underneath. Shaded out vegetation can weaken or die, unable to carry out photosynthesis. Japanese honeysuckle can severely cause harm to natural areas. As such, landowners should control this species when discovered.

Identification Characteristics

Plant: Perennial vine, herbaceous, woody when mature, 6" - 60' long.

Leaves: Simple, opposite arrangement, oval shaped, smooth margins, 3" long, densely foliated, some green leaves may remain on the plant nearly year round.

Vine Stem: Reddish-brown, flexible stem and light brown, hollow woody stem.

Flowers: Yellow and white, grow in pairs at leaf base, fragrant.

Fruit: Black berries in pairs.

Control of Japanese Honeysuckle

Mechanical Control: Root systems can be pulled or dug out. However, the entire root system may be difficult to remove.

Cultural Control: Fire can kill young plants and remove dense growth from mature plants, making a follow up herbicide treatment more manageable.

Chemical Control: Japanese honeysuckle can be controlled through the use of foliar treatments, basal bark treatments, or cut stump treatments.

Foliar - Apply glyphosate in water to all foliage of the plant.

Basal Bark - Apply a triclopyr ester formulation mixed with basal oil around the circumference of the lowest 15 inches of the woody vine.

Cut Stump - Woody stems can be cut and treated with glyphosate or triclopyr applied to the stump.





Japanese Hops
(Humulus japonicus)



The Problem with Japanese Hops

Japanese hops are native to East Asia. Like many of our non-native invasives, this herbaceous vine was brought to the United States as an ornamental in the late 1800s. This herbaceous vine prefers direct sunlight. For this reason, Japanese hops are more likely to be found in natural canopy openings or disturbed areas in the forest. Because of Japanese hops' rapid growth rate, it can dramatically dominate a site. Dense stands of this vine can form, blocking out light from other native vegetation. Japanese hops seed easily disperses by wind, water, animals, and machinery. If you discover Japanese hops in your forest, it should be controlled.

Identification Characteristics

Plant: Annual vine, herbaceous, 3' - 35' long.

Leaves: Palmate, opposite arrangement, 5-7 lobes, serrated margins, 2" - 4" long, rough texture.

Vine Stem: Green, small prickles facing downward, bract at base of leaf petiole.

Flowers: June - August, green, grow in clusters, 2 1/2" in length.

Fruit: Single flattened seed from female flowers.

Control of Japanese Hops

Mechanical Control: Small infestations can be hand pulled before seed sets. Gloves may be required to avoid cuts. Mowing and weed whipping are also effective before flowering, especially repeated treatments.

Cultural Control: Prescribed fire is not considered an effective control method.

Chemical Control: Japanese hops can be controlled through the use of foliar treatments.

Foliar - Apply glyphosate or triclopyr in water to all foliage of the plant before the plant produces seed (July or August).





Kudzu
(Pueraria montana)

The Problem with Kudzu

Kudzu is a perennial vine native to China and Japan. It was brought to the United States for landscaping purposes in the late 1800s. It was eventually promoted for erosion control and was planted throughout much of the southeast. Today, kudzu is known to be one of our most detrimental non-native invasives. This species has become an ecological threat. The vine can completely dominate and smother native forbs, shrubs, and trees. It is considered one of the more difficult non-native invasives to control. Kudzu has an extremely rapid growth rate. It has been reported to be able to grow a foot in length a day. In Illinois, Kudzu is present mostly as small infestations resulting from past plantings. If this vine is discovered on your property, it should be controlled.

Identification Characteristics

Plant: Perennial vine, semi-woody, deep rooted, fast growing, 30' - 100' long.

Leaves: Compound, alternate arrangement, 3 leaflets, dark green, 3" - 10" long, hairy underneath, densely foliated.

Vine Stem: Goldish in color, hairy when young.

Flowers: Late summer, pink, grow in clusters, pea-like.

Fruit: Brown pods growing in clusters.

Control of Kudzu

Mechanical Control: Heavy grazing pressure could eradicate smaller infestations if repeated for 3 - 4 years. Cutting vines close to the ground during hot dry summer months may kill plants. Mechanical control is ineffective in mature, established stands.

Cultural Control: Fire can effectively remove old growth to expose new growth that can be treated with herbicide.

Chemical Control: Kudzu can be controlled through the use of foliar treatments.

Foliar - Apply clopyralid when plants are flowering (August or September).

Clopyralid is selective to plants in the bean and aster families. This herbicide will help to not harm vegetation and trees underneath vines.





Oriental Bittersweet
(Celastrus orbiculatus)



The Problem with Oriental Bittersweet

Oriental bittersweet is a woody vine native to parts of Asia. This vine was brought to the United States for landscaping purposes in the 1860s. While Oriental bittersweet may not be as widespread as some of our invasives in Illinois, it is nonetheless a concern. This vine can easily escape yards and invade natural areas. Oriental bittersweet can grow quickly, covering and shading out native forbs, shrubs, and trees. Its woody, constricting vine can even girdle trees. It is a popular food source for birds. Birds can carry seeds long distances, widening its distribution throughout the state. If you discover Oriental bittersweet in your forest, it should be controlled.

Identification Characteristics

Plant: Perennial vine, woody, 10' - 60' long.

Leaves: Simple, alternate arrangement, round, serrated margins, 3" - 4" long.

Vine Stem: Bright green new growth, reddish-brown larger stems, fish net texture.

Flowers: Late spring - early summer, yellow-green, grow in clusters of 2 or 3 at leaf axel.

Fruit: Red berries with yellow skin on female plants, fruit remains through winter.

Control of Oriental Bittersweet

Mechanical Control: Seedlings can be pulled; however, the roots of mature plants can be difficult to remove.

Cultural Control: Prescribed fire can kill seedlings. More mature plants should not be burned unless followed up with an herbicide treatment.

Chemical Control: Oriental bittersweet can be controlled through the use of foliar treatments, basal bark treatments, or cut stump treatments.

Foliar - Apply glyphosate in water to all foliage of the plant.

Basal Bark - Apply a triclopyr ester formulation mixed with basal oil around the circumference of the lowest 15 inches of the woody vine.

Cut Stump - Woody stems can be cut and treated with glyphosate or triclopyr applied to the stump. Uptake is not always successful. This method should be followed up with monitoring.





Garlic Mustard
(Alliaria petiolata)



The Problem with Garlic Mustard

Garlic mustard is a plant native to Europe that was discovered in the United States in the late 1860s. Today, garlic mustard is rapidly spreading throughout the state. It spreads seed easily by way of wind, water flow, animals, and equipment. This plant has many competitive advantages over native plants. Garlic mustard can thrive in varying light conditions, tolerating shade and partial sun. It also emerges earlier than most vegetation in the spring. Studies have even reported that garlic mustard is allelopathic, meaning it exudes chemicals that inhibit the growth of nearby vegetation. One helpful identification characteristic of garlic mustard is that the leaves put off a garlic aroma when crushed. Since this plant threatens native ecosystems, it should be controlled.

Identification Characteristics

Plant: Biennial herb, 6" - 3' tall.

Leaves: Simple, heart shaped-rounded, wavy margins, 2" across on first year plants. Second year plants have triangular, coarsely toothed leaves.

Stem: Second year plants grow from rosette, normally one flowering stem.

Flowers: April - June, white, 4 petals, grow in clusters, grow atop stocks.

Fruit: Green seedpod, turns tan with age, seeds disperse mid-summer.

Control of Garlic Mustard

Mechanical Control: Plants are easily hand pulled. Plants should be bagged and taken off site if flowering.

Cultural Control: Prescribed fire in late spring can kill seedlings. A flush of regrowth can occur after a burn, so monitoring and treatment with an herbicide may exhaust the seedbank quicker.

Chemical Control: Garlic mustard can be eradicated through the use of foliar treatments.

Foliar - Apply glyphosate or triclopyr in water to all foliage of the plant in the rosette stage or bolting stage (flowering stem stage). It is not recommended to walk through garlic mustard when seeds are mature. When the seeds set, garlic mustard can spread very easily.





**Japanese Chaff Flower
(*Achyranthes japonica*)**



The Problem with Japanese Chaff Flower

Japanese chaff flower is a perennial herb native to East Asia. It is unknown exactly how or why this plant was brought to the United States. Japanese chaff flower was first discovered in Eastern Kentucky in the 1980s. This plant has rapidly spread throughout the lower Ohio River Valley, spread by floodwaters, wildlife, and humans. The seeds of Japanese chaff flower have stiff bracts that can easily stick to animal fur or clothing, which makes this plant very easy to spread. Japanese chaff flower thrives in partial shade and tolerates full shade environments. This plant typically invades wetter environments such as flood plains and bottomland forest; however, it also invades drier soils, field edges, roadsides, and other disturbed areas. Japanese chaff flower can quickly outcompete native plants, and for this reason, it should be controlled.

Identification Characteristics

Plant: Perennial herb, grows densely, 3'- 6' tall.

Leaves: Simple, opposite arrangement, ovate-elliptic shape, slightly wavy margins, slightly pubescent.

Stem: Mature plants are green with red tints, seedlings are red, slightly pubescent.

Flowers: Late summer, clusters of erect spikes, no petals.

Fruit: Lay flat against spikes, stiff bracts, seeds mature in early fall.

Control of Japanese Chaff Flower

Mechanical Control: Small plants can be hand pulled. More mature plants can be difficult to remove the entire root system, which leads to resprouting. Mowing may reduce seed production but will not kill the plant.

Cultural Control: Prescribed fire is not yet recommended as a control method for Japanese chaff flower.

Chemical Control: Japanese chaff flower can be controlled through the use of foliar treatments.

Foliar - Apply glyphosate or triclopyr in water to all foliage of the plant between emergence until the seed production stage. It is not recommended to walk through

Japanese chaff flower when seeds are mature. When the seeds set, chaff flower can spread very easily.





Sericea Lespedeza
(*Lespedeza cuneata*)



The Problem with Sericea Lespedeza

Sericea lespedeza is an annual legume native to Japan. This invasive plant was brought to the United States in the 1890s for agricultural purposes. It was later used as erosion control. Today, sericea lespedeza has become a major issue in prairie, forest edge, roadside, and disturbed environments. This plant is less of an issue in dense forested areas; however, it can invade forested areas with canopy gaps. It prefers full to partial sun lighting conditions. Sericea lespedeza can be difficult to control. Seeds from this plant can remain viable in the seed bank for 20 years or longer. It forms dense stands, easily outcompeting native plants. Sericea lespedeza control requires repeated treatment and monitoring to control infestations. However, if discovered on your property, it should be controlled.

Identification Characteristics

Plant: Annual legume, grows densely, 1.5'- 6' tall.

Leaves: Compound, 3 leaflets, elongated shape, 1/4" - 1" long.

Stem: Herbaceous - somewhat woody, many leafy branches.

Flowers: Late summer - early fall, petals are white with pinkish-purple tints,

Fruit: Flat oval shaped legumes, seeds are greenish-tan in color, seeds produced October - March.

Control of Sericea Lespedeza

Mechanical Control: Mowing during the flowering stage before seeds form can suppress sericea when carried out for 2 - 3 years. However this will not kill the sericea.

Cultural Control: Prescribed fire can kill seedlings but will likely spark aggressive regrowth. This is only an effective control if paired with herbicide treatments, which can exhaust the seedbank.

Chemical Control: Lespedeza can be controlled through the use of foliar treatments.

Foliar - Foliar applications of a mix of triclopyr and fluroxypyr during the flowering stage is an effective way to control lespedeza. Treatments should be carried out before seeds are produced.





Japanese Stiltgrass
(Microstegium vimineum)



The Problem with Japanese Stiltgrass

Japanese stiltgrass is an annual grass native to many countries in Asia. It was discovered in the United States in 1919, likely introduced by accident through shipping materials. This annual grass can thrive in a variety of growing conditions. It establishes well in moist nitrogen-rich soils, but can also tolerate multiple soil types. Japanese stiltgrass can thrive in varying light conditions from heavy shade to full sun. This annual grass often invades forested floodplains, stream banks, upland forests (especially canopy gaps), fields, trails, and even yards. Japanese stiltgrass proliferates rapidly, outcompeting native plants. It grows very dense, forming thick carpets of grass along the forest floor. If discovered, it should be controlled.

Identification Characteristics

Plant: Annual grass, grows densely, 1'- 3.5' tall.

Leaves: Simple, pale green, silvery stripe down middle, lance shaped, 3" long.

Flowers: Late summer, spikes at the end of stems.

Fruit: Yellowish-red seeds, appear in early - mid fall, viable for 5+ years.

Control of Japanese Stiltgrass

Mechanical Control: Small plants can be hand pulled, however this would be impractical for dense infestations. Mowing or weed whipping can be effective if performed before plants flower.

Cultural Control: Prescribed fire will result in a flush of germination, which can be followed up with an herbicide treatment.

Chemical Control: Japanese chaff flower can be controlled through the use of foliar treatments.

Foliar - Apply a grass-specific herbicide, such as sethoxydim or clethodim in mid to late summer before seeds mature. Glyphosate in water will also work but is non-selective. With glyphosate, extra care should be taken to not spray native vegetation. Glyphosate also has water-safe formulations, which can be necessary when spraying near water.



Types of Leaves



Compound Leaf



Simple Leaf

Leaf Shapes



Linear/Elongated



Ovate/Oval



Lanceolate



Orbicular/Rounded



Cordate/Heart



Lobed



Toothed/ Serrated



Smooth

Leaf Arrangement



Alternate Leaf Arrangement



Opposite Leaf Arrangement

Selecting the Proper Herbicides

Plant	Herbicide/Rate	Notes
Amur Honeysuckle <i>Lonicera maackii</i>	Foliar: 2-4% G Basal Bark: 20-30% T_E Cut Stump: 25-50% G or T_A	Treat stumps within 15 minutes of cutting for best results when cut stump treating.
Autumn Olive <i>Eleagnus umbellata</i>	Foliar: 1-2% T Basal Bark: 20-30% T_E Cut Stump: 25-50% G or T_A	Treat stumps within 15 minutes of cutting for best results when cut stump treating.
Common Buckthorn <i>Rhamnus cathartica</i>	Foliar: 1-2% T_A Basal Bark: 20-30% T_E Cut Stump: 25-50% T_A	When spraying near water, use aquatic safe formulations.
Callery Pear <i>Pyrus calleryana</i>	Foliar: 2-4% G or 1-2% T Basal Bark: 20% T_E Cut Stump: 25-50% G or T_A	Treat stumps within 15 minutes of cutting for best results when cut stump treating. When spraying near water, use aquatic safe formulations.
Multiflora Rose <i>Rosa multiflora</i>	Foliar: 2-4% G or 1-2% T Basal Bark: 20% T_E Cut Stump: 25-50% G or T_A	Care should be taken to not spray lookalike species of native roses. Work cautiously around multiflora rose to avoid thorns.
Princess Tree <i>Paulownia tomentosa</i>	Foliar: 2-3% G or 1-2% T Basal Bark: 20% T_E Cut Stump: 25-50% G or T_A	Treat stumps within 15 minutes of cutting for best results when cut stump treating.
Privet <i>Ligustrum spp.</i>	Foliar: 2% G or 1-2% T_A Basal Bark: 20-25% T_E Cut Stump: 20-25% T_A or 25-50% G	When spraying near water, use aquatic safe formulations.
Tree of Heaven <i>Ailanthus altissima</i>	Foliar: 2-4% G or 1-2% T Basal Bark: 20% T_E	When applying foliar treatments, treat during the growing season. Larger trees should be girdled, with herbicide applied to cut.
Winged Burning Bush <i>Euonymus alatus</i>	Foliar: 1.5-2% G Basal Bark: 20-30% T_E Cut Stump: 25-50% T_A	Treat stumps within 15 minutes of cutting for best results when cut stump treating.

G = Glyphosate**T** = Triclopyr**T_A** = Triclopyr Amine**T_E** = Triclopyr Ester**Clo** = Clopyralid**Cle** = Clethodim**S** = Sethoxydim

Selecting the Proper Herbicides

Plant	Herbicide/Rate	Notes
Japanese Honeysuckle <i>Lonicera japonica</i>	Foliar: 2-4% G Basal Bark: 10-20% T Cut Stump: 10-20% T or 20-25% G	When foliar spraying, treat in the fall when natives have lost their leaves to mitigate off-target damage. JHS hold their leaves longer in the fall.
Japanese Hops <i>Humulus japonicus</i>	Foliar: 2% G or T	Treat in July or August before seeds are produced.
Kudzu <i>Pueraria montana</i>	Foliar: 0.5% Clo	Treat when plants are flowering in August or September.
Oriental Bittersweet <i>Celastrus orbiculatus</i>	Foliar: 2% G or 1-3% T Basal Bark: 20-30% T_E Cut Stump: 10-20% T or 20-25% G	Care should be taken to not confuse this species with its native lookalike, American bittersweet.
Garlic Mustard <i>Alliaria petiolata</i>	Foliar: 1-3% G or 1.5% T	Care should be taken to not spread seed when seeds are mature. Avoid walking through patches during this time.
Japanese Chaff Flower <i>Achyranthes japonica</i>	Foliar: 2% G or T	Care should be taken to not spread seed when seeds are present. Japanese chaff flower seeds easily stick to clothing and spread.
Sericea Lespedeza <i>Lespedeza cuneata</i>	Foliar: 0.4% T + F	Sericea lespedeza create dense seedbanks. This species will require repeated monitoring and treatment to eradicate infestations.
Japanese Stiltgrass <i>Microstegium vimineum</i>	Foliar: 1.5% S or Cle or 1-1.5% G	When spraying near water, use aquatic safe formulations.

Note: Herbicide rates shown in this table represent commonly available formulations of herbicide. To find the proper rates for a specific formulation of herbicide, always check the product label.

Phenology Calendar

Phenology Calendar

Jan Feb Mar Apr May Jun July Aug Sep Oct Nov Dec

		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Amur honeysuckle†	N												
	C												
	S												
Autumn olive	N												
	C												
	S												
Buckthorn: Common & Glossy	N												
	C		*	*	*	*	*	*	*	*	*	*	*
Callery (Bradford) pear	N												
	C												
	S												
Common privet	S												
Garlic mustard	N												
	C												
	S												
J. chaff flower	S												
J. honeysuckle	C	*	*	*	*	*	*	*	*	*	*	*	*
	S												
Japanese hops	N												
	C												
	S												
Japanese stiltgrass	N	*	*	*	*	*	*	*	*	*	*	*	*
	C	*	*	*	*	*	*	*	*	*	*	*	*
	S												
Kudzu	S	*	*	*	*	*	*	*	*	*	*	*	*
Multiflora rose	N												
	C												
	S												

† - Fruit of the other bush
honeysuckle species
mature 6-8 weeks earlier

- * - No data
- - Dormant
- - New Germinates
- - Rosette
- - Bud swell
- - Bud break
- - Leaf Emergence

- - Vegetative Growth
- - Bolting
- - Flower bud
- - Flower
- - Seed/Fruit Immature
- - Seed/Fruit Mature
- - Leaf color/senescence

N- Northern, C- Central, S- Southern

Phenology Calendar

Phenology Calendar

		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Oriental bittersweet	N		**	**	**	**	**	**	**	**	**	**	**
	C	**	**	**	**	**	**	**	**	**	**	**	**
	S												
Princesstree	S												
	S												
Sericea lespedeza	C												
	S												
Tree of Heaven	N												
	C												
	S												
Winged burning bush	N	**	**	**	**	**	**	**	**	**	**	**	**
	C	**	**	**	**	**	**	**	**	**	**	**	**
	S	**	**	**	**	**	**	**	**	**	**	**	**

- | | | | |
|---|------------------|---|-------------------------|
| * | - No data |  | - Vegetative Growth |
|  | - Dormant |  | - Bolting |
|  | - New Germinates |  | - Flower bud |
|  | - Rosette |  | - Flower |
|  | - Bud swell |  | - Seed/Fruit Immature |
|  | - Bud break |  | - Seed/Fruit Mature |
|  | - Leaf Emergence |  | - Leaf color/senescence |

N- Northern, C- Central, S- Southern

Forest Terms

Annual - A plant that completes its life cycle in a single growing season.

Biennial - A plant that completes its life cycle in two growing seasons.

Biodiversity - The variety of life in a particular ecosystem or habitat.

Bolting Stage - The growth stage at which a plant puts on vertical growth to flower.

Bracts - A small leaflike structure.

Cross Pollination - The transfer of pollen from the flower of one plant to the flower of a plant having a different genetic constitution.

Cultivar - A plant variety that has been produced through selective breeding.

Disturbed Areas - Areas impacted by events that impact the composition and structure of a forest.

Drupe - A fleshy fruit that has thin skin and a central stone that contains the seed.

Forbs - An herbaceous flowering plant.

Girdle - A cut through the bark all around a tree which severs the crown to root cambium connection, often killing the tree.

Herbicide - A chemical that is toxic to plants, often used to eradicate unwanted vegetation.

Legume - The long seedpod of a leguminous plant.

Lenticels - Raised pores on the stem of a woody plant that allows for gas exchange between atmosphere and plant tissue.

Non-ionic Surfactants - A useful addition to chemical mixtures that can optimize wetting, spreading and act as an emulsifier or foaming agent.

Ornamental - plants that are grown for decorative purposes, often used in landscaping or gardens.

Forest Terms

Perennial - A plant that lives two or more years.

Pith - The spongy tissue found in the center of the stem of most vascular plants.

Rosette - A plant growth habit where leaves radiate outwards from a short stem at ground level, often forming a circular arrangement.

Rosette Stage - The growth stage where some plants remain in rosette form before bolting and flowering occurs.

Seed Bank - The natural storage of seeds within the soil of an ecosystem.

Soil Compaction - The negative impact of compressing soil, making it more dense and less porous. This can effect the infiltration and drainage of a soil, discouraging many species of plants.

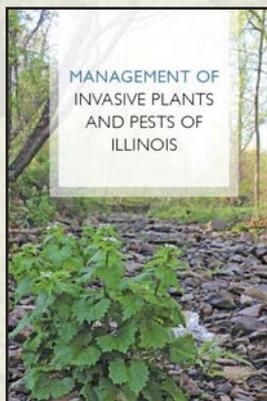
Stands - The formation of a number or cluster of trees/plants occupying a specific area that is generally uniform in species type, age, and size.

Umbels - A flower cluster which stalks from a common center.

Woody Invasives - A non-native invasive plant with a woody stem due to lignified tissue (wood stem).

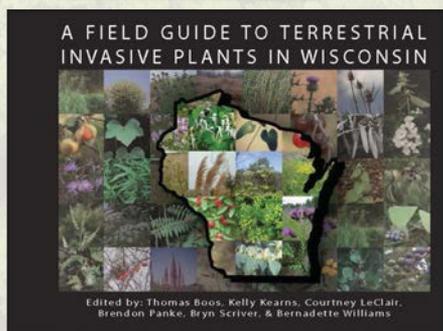
Other Helpful Guides

All these resources can be downloaded at:
<https://www.ilforestry.org/Non-Native-Invasive-Plants>



*For overall control of Illinois
invasive plants*

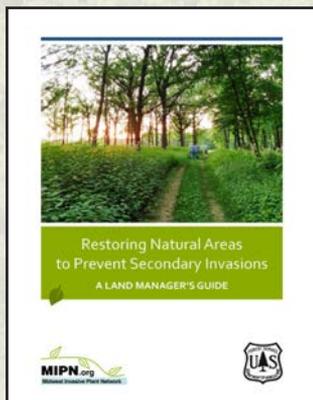
*For identification of Southern
Illinois invasive plants*



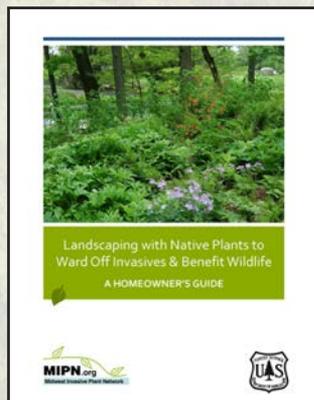
*For identification and control of
Northern Illinois invasive plants*



*For identifying native alternatives
to Illinois invasive species*



For restoring native plants to an area



For landscaping with native plants

Helpful Online Resources

Mapping Resources

eddmaps.org

This fantastic online resource has distribution maps that show the geographical range of various species, including invasive plants. The site compiles user data to populate maps. Help spread awareness about the spread and control of invasives by reporting invasive species infestations in your county.

Control Information

www.mipn.org/control/

This website, from the University of Wisconsin and the Midwest Invasive Plant Network, gives information on control techniques for invasive plants.

Spread and Prevention

www.fs.fed.us/t-d/pubs/pdf/05511203.pdf

This US Forest Service publication gives great information about cleaning equipment to prevent further spread of non-native invasive plants.

Identification

invasive.org

Center for invasive species: Information, mapping, and resources on invasive species and ecosystem health.



ILLINOIS
F*orestry*
A*ssociation*