

# Invasive Plants Field Guide



## Fontenelle Forest



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# Mission Statement

The purpose of this handbook is to:

- 1) Inform guests of invasive plant species that are present in Fontenelle Forest
- 2) Show guests where invasive species can be found in Fontenelle Forest based on staff monitoring efforts
- 3) Explain possible control options for invasive plant species

# Notes

Explore Fontenelle Forest and see if you can find any of these species.

If any of these species are found in areas not shown in this book please make this information known to staff

# Table Of contents

## I. State Noxious

- i. Musk Thistle.....1
- ii. Plumeless Thistle.....3
- iii. Canada Thistle.....5
- iv. Sericea lespedeza.....7
- v. Purple loosestrife.....9
- vi. Phragmites.....11

## II. County Noxious

- i. Bull Thistle.....13
- ii. Cut Leaved Teasel.....15

## III. Priority

- i. Crown vetch.....17
- ii. Garlic Mustard.....19

## IV. Problematic

- i. Autumn Olive.....21
- ii. Honeysuckle.....23
- iii. Tree of Heaven.....25
- iv. Red cedar.....27
- v. Multiflora Rose.....29

# Table of Contents

## Cont.

### V. Not Legally Listed

- i. Japanese Siltgrass.....31
- ii. Sweet Clover.....33
- iii. Dame's Rocket.....35
- iv. Barberry.....37
- v. Queen Anne's Lace.....39
- vi. Reed Canary Grass.....41

- Methods.....43
- Acknowledgments.....44
- Works cited.....45

# Thistle – Musk

*Carduus nutans*



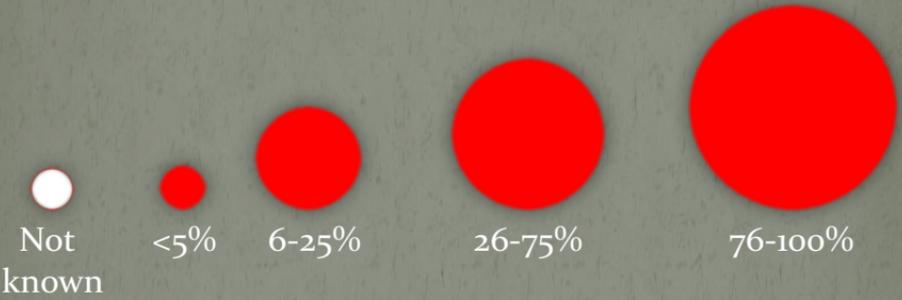
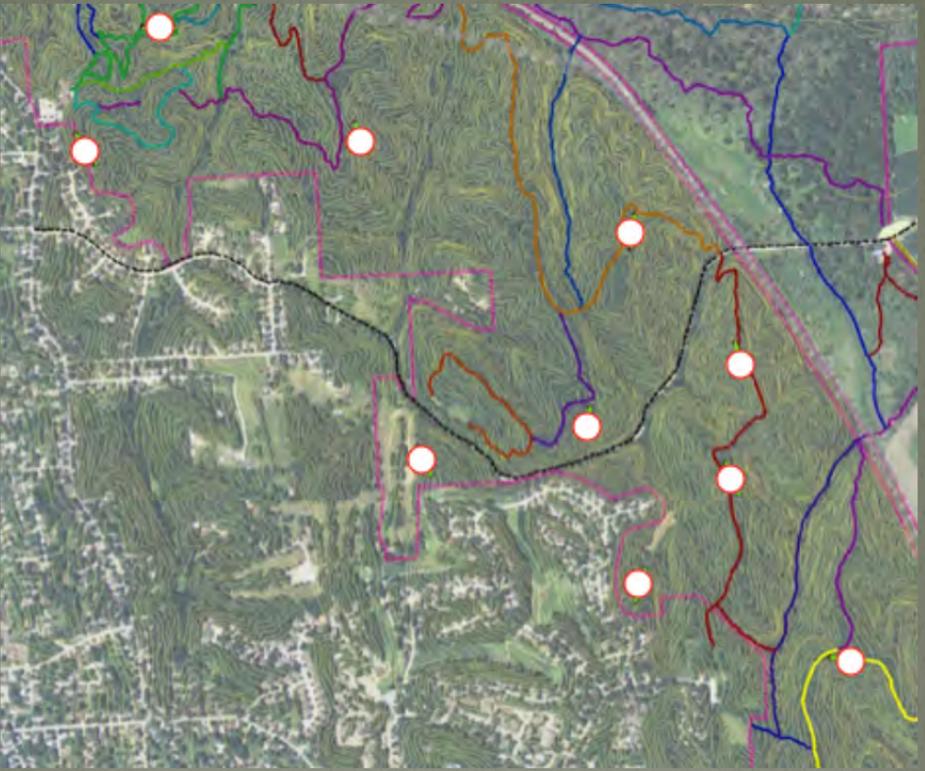
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Legal status: State Noxious

Habitat: Rangelands and open woodlands.

Why is it here? Originated from North Africa and Eurasia.

Impact: Produces a large quantity of seeds which create dense patches. Reduces the yield of agriculture production.



How does it move? The seeds are transported a variety of ways mostly by wind and mammal fur. The seeds have been known to travel by waterways.

Recent control discussion: See Bull thistle (*Cirsium vulgare*)

# Thistle - Plumeless

*Carduus acanthoides*

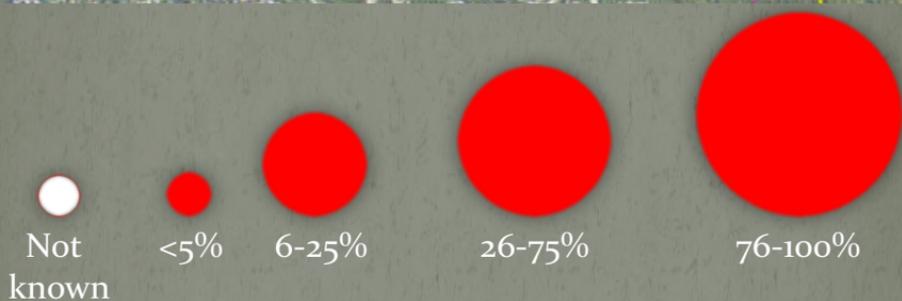
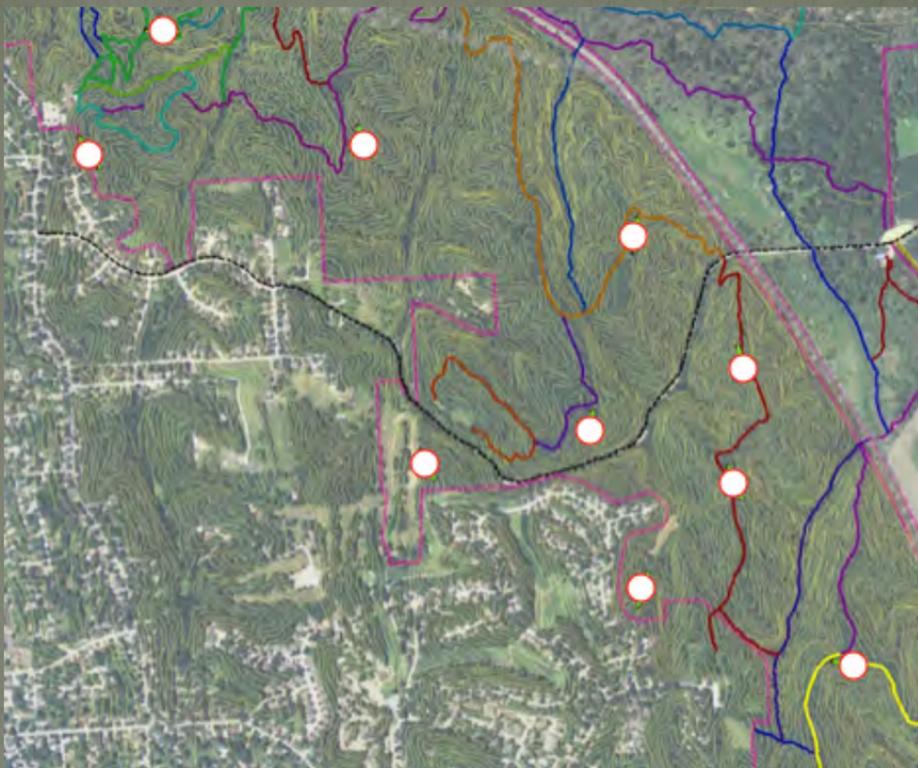


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Legal status: State Noxious

Habitat: Pastures, rangelands and roadsides.

Why is it here? Introduced from Eurasia.



Impact: Competes with native plants and agriculture. Causes monetary loss to the agriculture industry.

How does it move? Seeds are dispersed by the wind.

Recent control discussion: See Bull thistle (*Cirsium vulgare*)

# Thistle - Canada

*Cirsium arvense*



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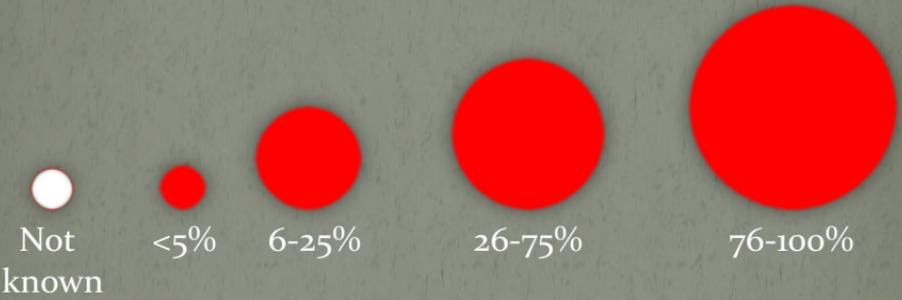
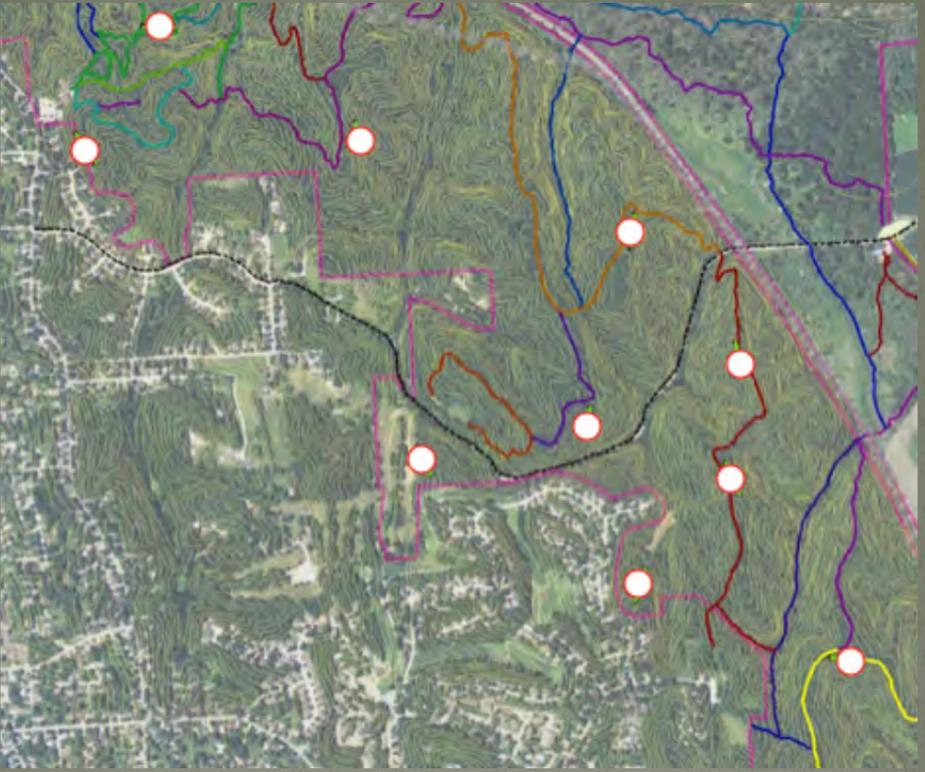
Legal status: State Noxious

Habitat: Rangelands, croplands, pastures and riparian areas.

Why is it here? Originated from North Africa and Eurasia.

Impact: Releases toxins into the soil killing other plant species.

Competes with agricultural and native species. Causes multi-million dollar losses every year.



How does it move? Can be wind blown up to half a mile. Travels by attaching seeds to mammals and by waterways.

Recent control discussion: A study by Wilson in Scottsbluff Ne found that planting a suite of native competitive grasses along with the applying herbicide reduced 90% of the population of thistle in three years.(10)

# Sericea lespedeza

*Lespedeza cuneata*



© Chris Moorman

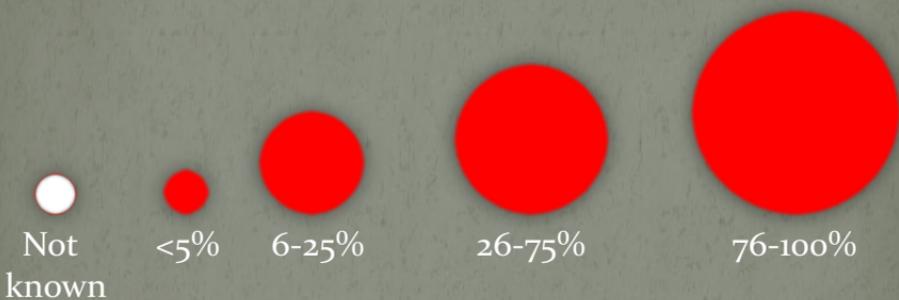
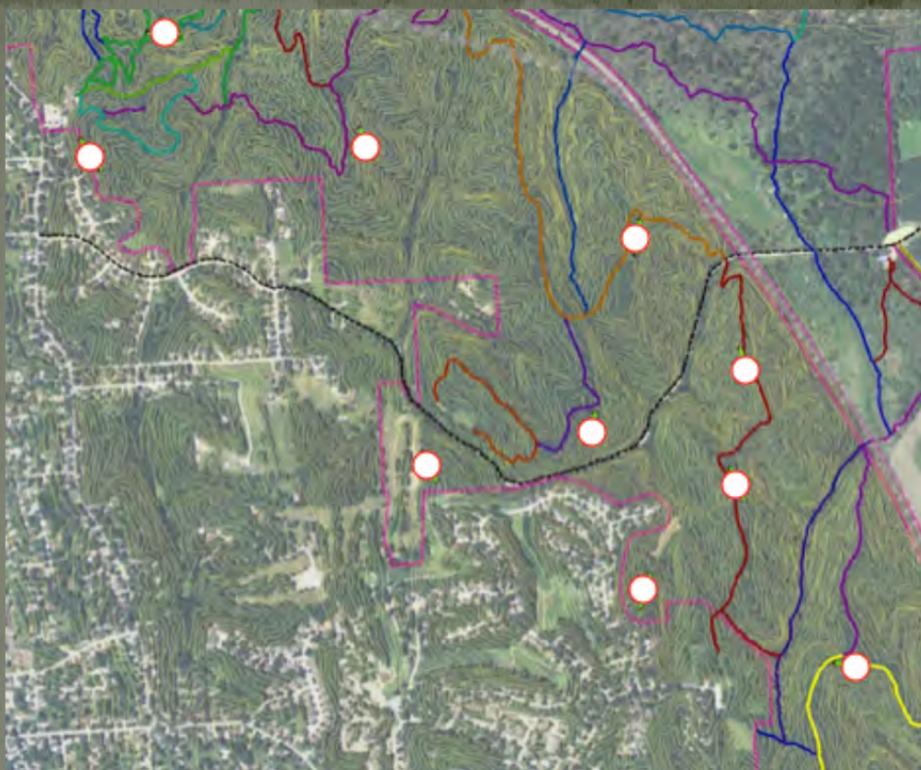
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Legal status: State Noxious

Habitat: Grasslands, roadways and beside waterways.

Why is it here? Introduced from Asia for stabilizing stream banks and forage.

Impact: Contains dyes that reduce forage quality. Competes aggressively with native species.



How does it move? It is found in grass seed mixes. Spreads by movement with wildlife. Seeds can stay viable in the ground for 20 years.

Recent control discussion: *Lespedeza cuneata* contains a high density of tannin which is why it is poor forage. Gamble says using a fungus (*C. subvermispora*) which prefers to feed on tannin is a good way to control the species. (11)

# Purple loosestrife

*Lythrum salicaria*



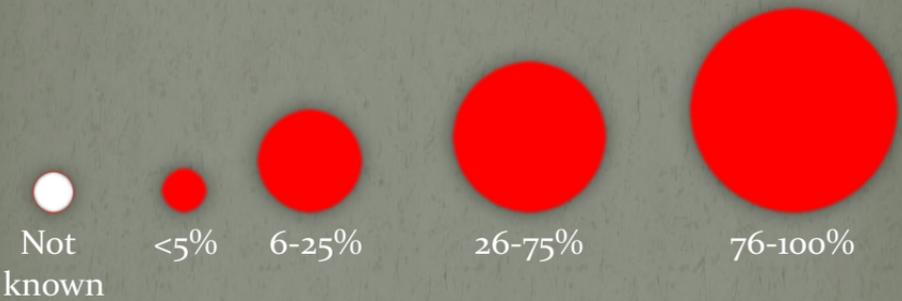
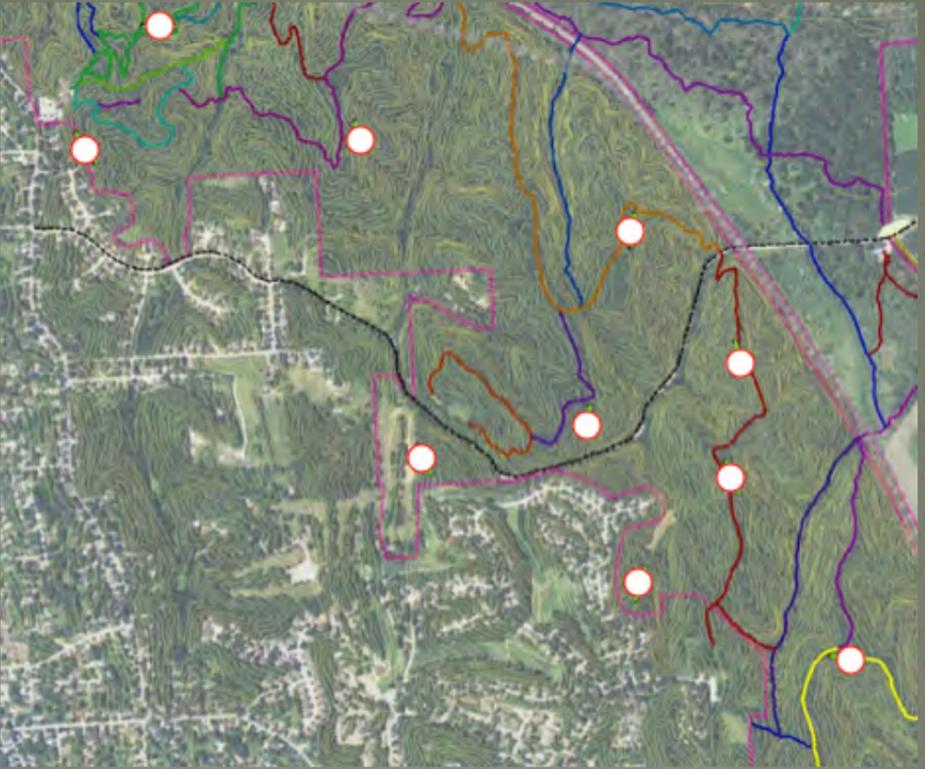
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Legal status: State noxious

Habitat: Ditches, river banks, lowlands and marshes.

Why is it here? Introduced for landscaping from Europe.

Impact: Very resistant to flooding. Can restrict water movement and trap sediment. Very adaptable to many environments and competes with native species.



How does it move? Stems easily re-sprout. Seeds are dispersed by wind and water. Seeds can attach themselves to fur and clothing.

Recent control discussion: According to Blossey conventional control methods are unsuccessful in controlling purple loosestrife. Releasing a beetle (*G. pusilla*) will control the population by laying larvae inside and getting fed upon.(7)

# Phragmites

*Phragmites australis*



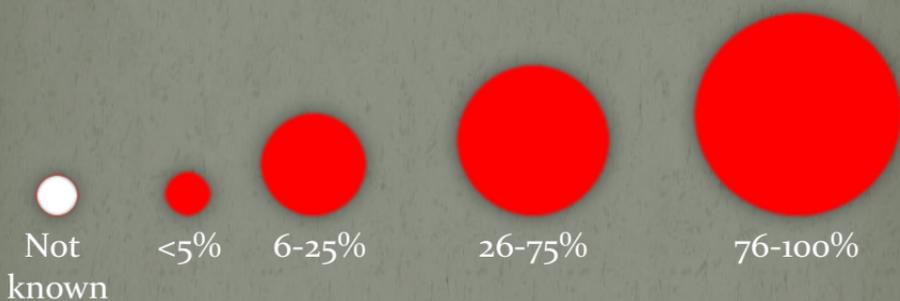
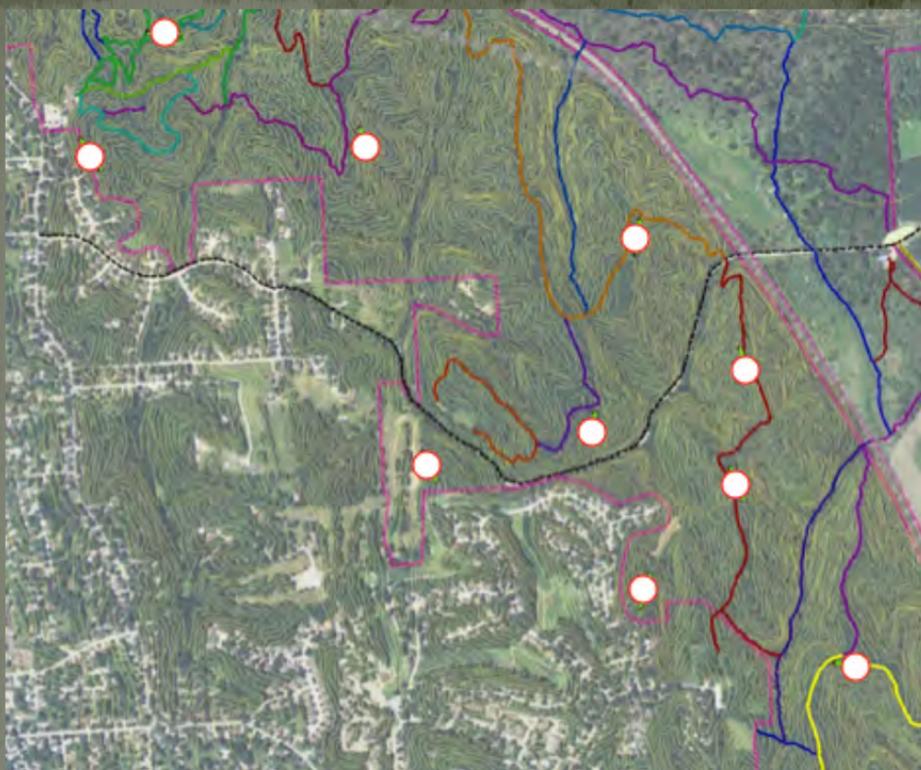
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Legal status: State noxious

Habitat: Found in marshes, flood plains, ditches, ponds and waterways.

Why is it here? Phragmites was introduced from Europe to control soil erosion.

Impact: Phragmites restricts water movement, traps sediment and changes water quality. Phragmites adapts well to many environments and competes with native species.



How does it move? Phragmites is transported many different ways. It can move by seed dispersal through water and wind. It can move laterally using above ground rhizomes. Rhizomes can also break off from the main plant and easily root down river.

Recent control discussion: biological control is a new approach. Exposing Phragmites to rhizome feeding species like *Rhizedra lutosa* which is already present in North America. (1)

# Thistle - Bull

*Cirsium vulgare*



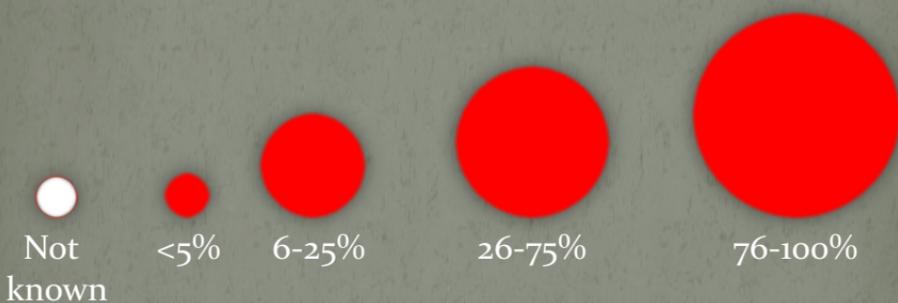
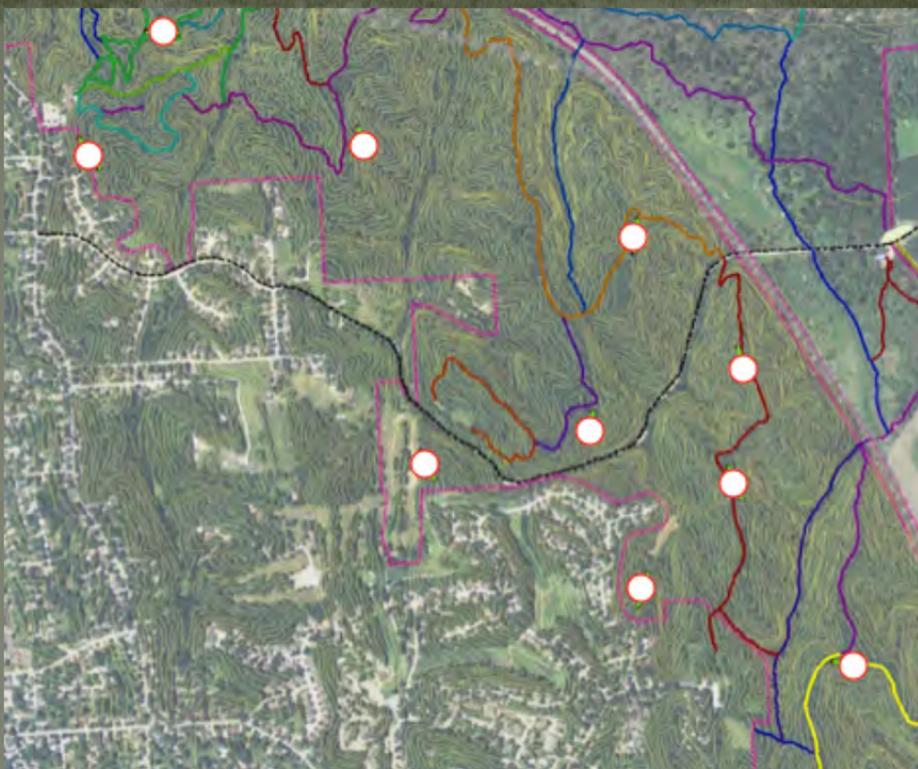
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Legal status: County noxious in Brown and Rock counties in Nebraska.

Habitat: Pastures, rangelands and riparian areas.

Why is it here? Originated from Eurasia. Introduced in the late 1800s.

Impact: Reduces forage quality of pastures. Spiny stems make it unpalatable for cattle. Competes with native vegetation.



How does it move? Seed dispersal is mainly by wind.

Recent control discussion: According to KOK there is a species of weevil (*Ceuthorhynchidius horridus*) that feeds on and lays eggs in the thistle in the rosette stage of its life cycle. This stops the thistle from developing further and stopping seed production from ever happening. This study was done on Bull thistle, Musk thistle and Plumless thistle. The weevil was found to prefer these thistles over other plant species.(9)

# Cut leaved teasal

*Dipsacus laciniatus*



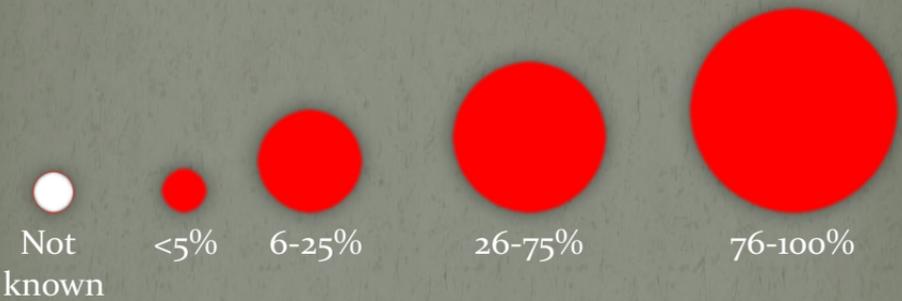
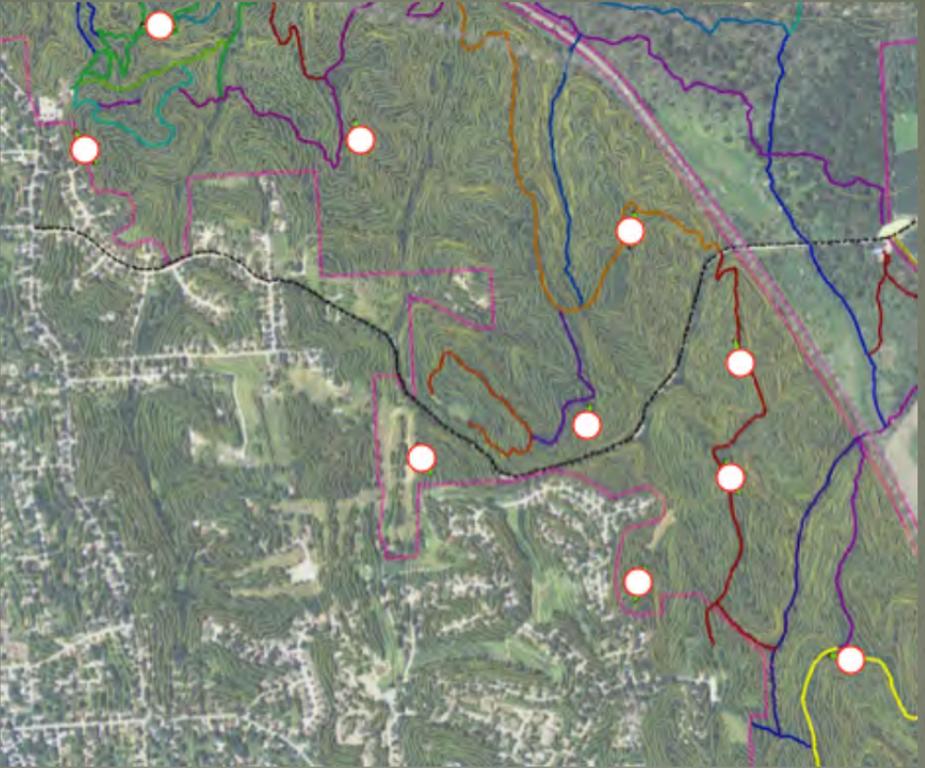
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Legal status: County Noxious Weed  
in Lancaster County

Habitat: Open sunny areas,  
roadsides and disturbed areas.

Why is it here? Introduced from  
Europe for fabric Industrial  
purposes.

Impact: Teasal forms dense stands  
and dominates areas, reducing  
forage quality and wildlife habitat.



How does it move? Dried seeds use the wind for transportation.

Recent control discussion: Rector, in a study, says that using Diptera, Coleoptera and Lepidoptera species from Teasals native habitat would strongly control their population.(4)

# Crown vetch

*Coronilla varia*



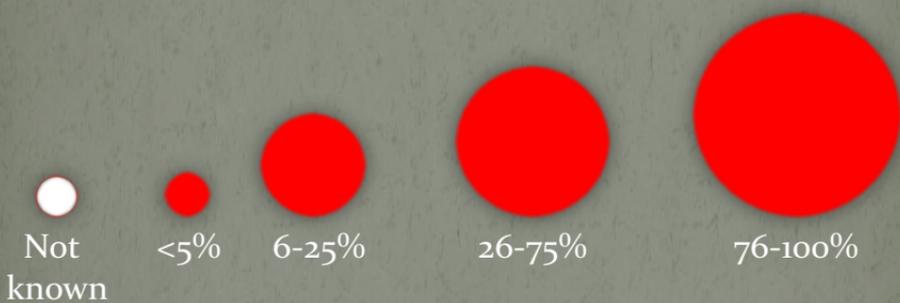
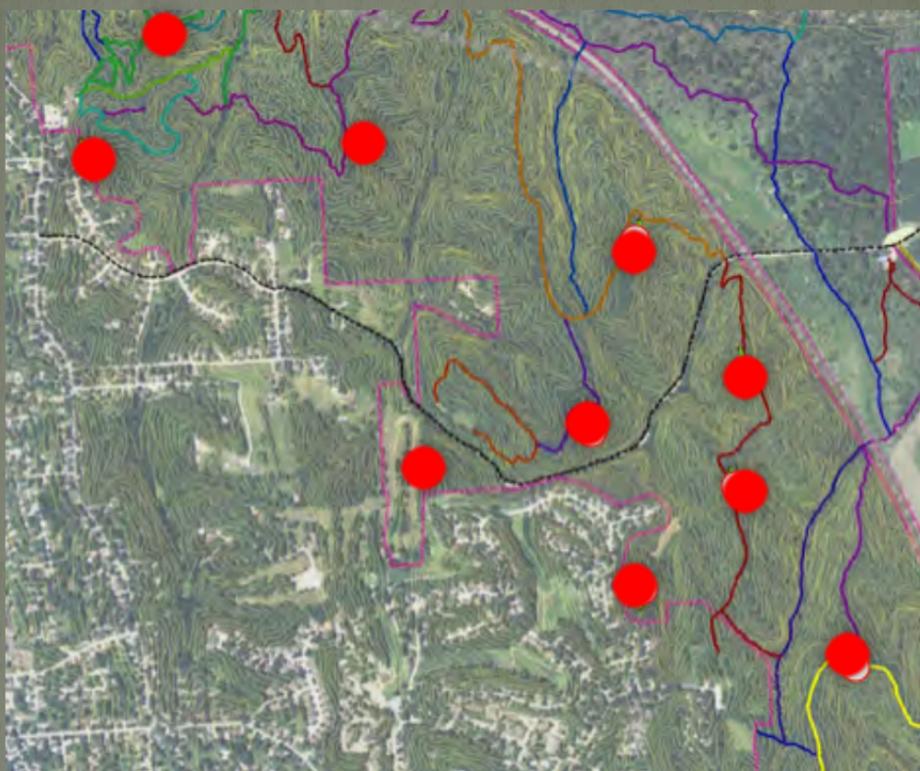
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Legal status: Priority

Habitat: sand, gravelly rocky soil, clays and loams. Also survives in acidic soil.

Why is it here? Introduced for the Mediterranean for erosion control, roadside planting and soil rehabilitation.

Impact: If poorly managed can crowd out native and desirable species.



How does it move? Crown vetch travels with strong fleshy rhizomes and clustered seed pods.

Recent control discussion: According to Indiana department of Natural resources repeated mowing or burning can control Crown vetch. Mowing must be repeated many times a year for consecutive years. Burning must also be repeated consecutive years.

# Garlic mustard

*Alliaria petiolata*



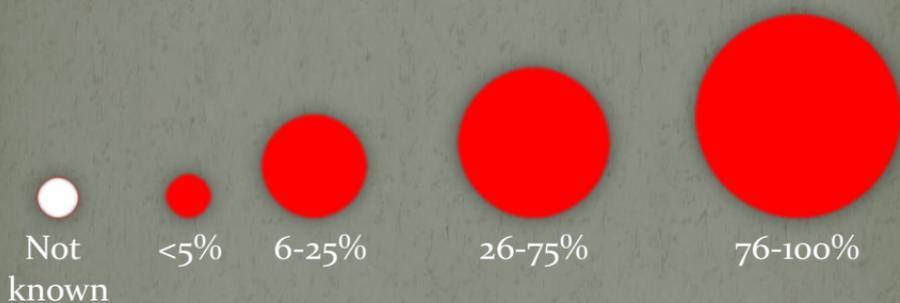
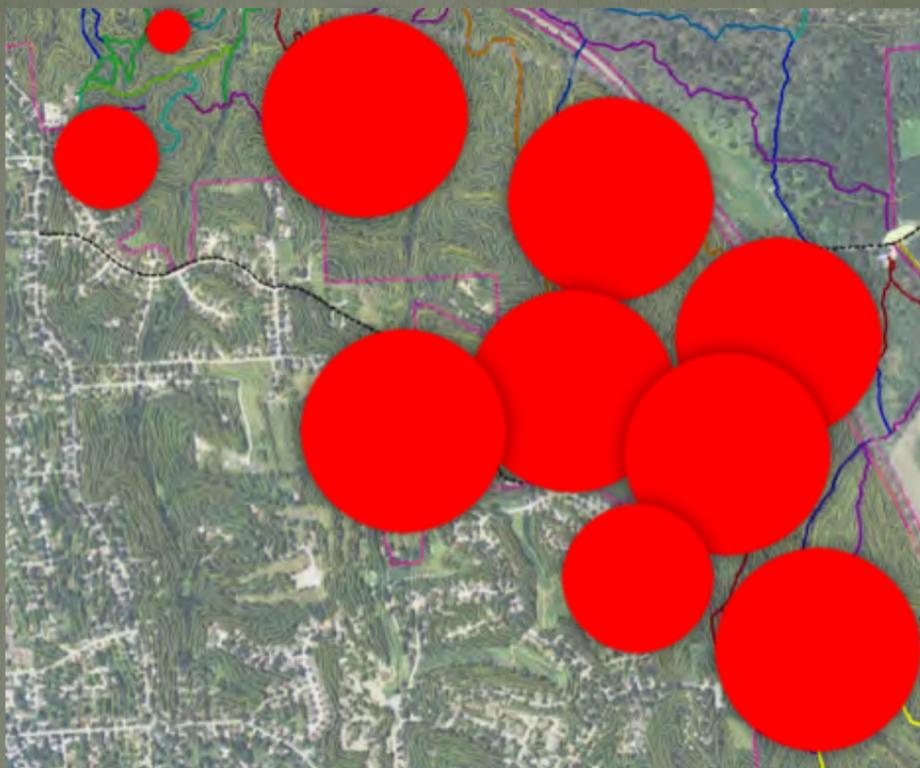
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Legal status: Priority

Habitat: Shaded areas, fields and roadsides.

Why is it here? Introduced from Europe.

Impact: Garlic mustard inhibits the growth of mycorrhizal and is toxic to butterfly larvae.



How does it move? The seeds of garlic mustard attach themselves to mammals fur. They can also be transported by waterways.

Recent control discussion: Nuzzo suggest that seed production should be prevented for many years to reduce the population of garlic mustard.(5)

# Autumn Olive

*Elaeagnus umbellata*



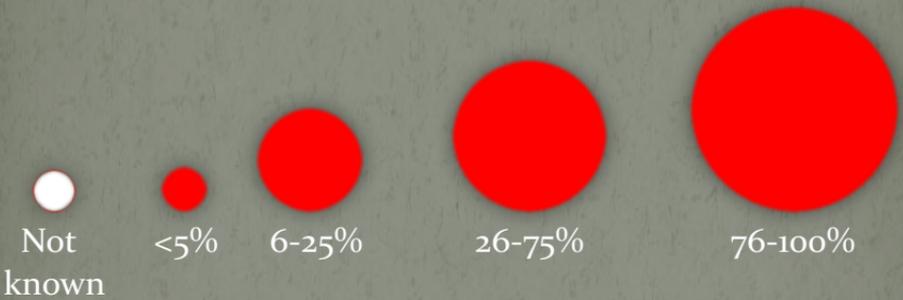
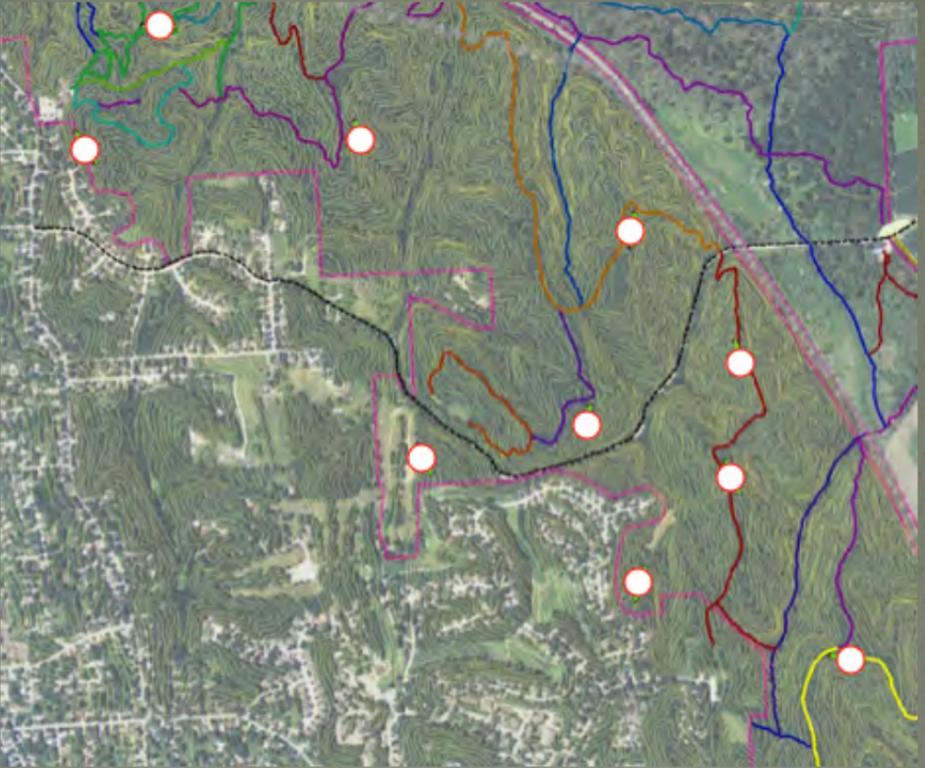
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Legal status: Problematic

Habitat: Grasslands, open fields, open forests and degraded areas.

Why is it here? Introduced in the 1830s from East Asia for ornamental, windbreaks and to restore degraded land.

Impact: Autumn Olive can fix its own nitrogen so it outcompetes and shades many native species.



How does it move? The main cause of dispersal is mammals and birds eating and transporting seeds.

Recent control discussion: Researchers at Western Washington University say that the best way to control Autumn olive is to apply foliar herbicide. (2)

# Honeysuckle – Tartarian and maack

*Lonicera tatarica & Lonicera maackii*



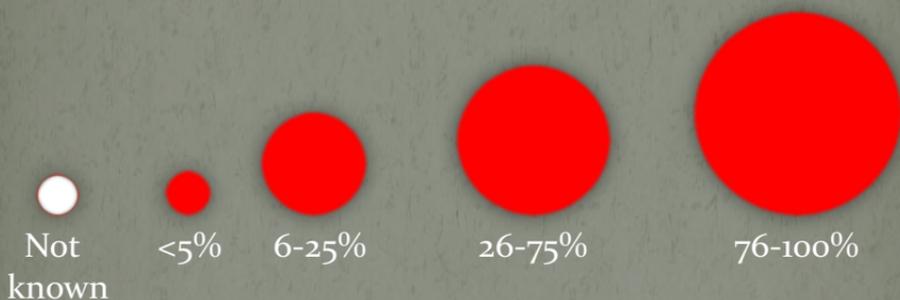
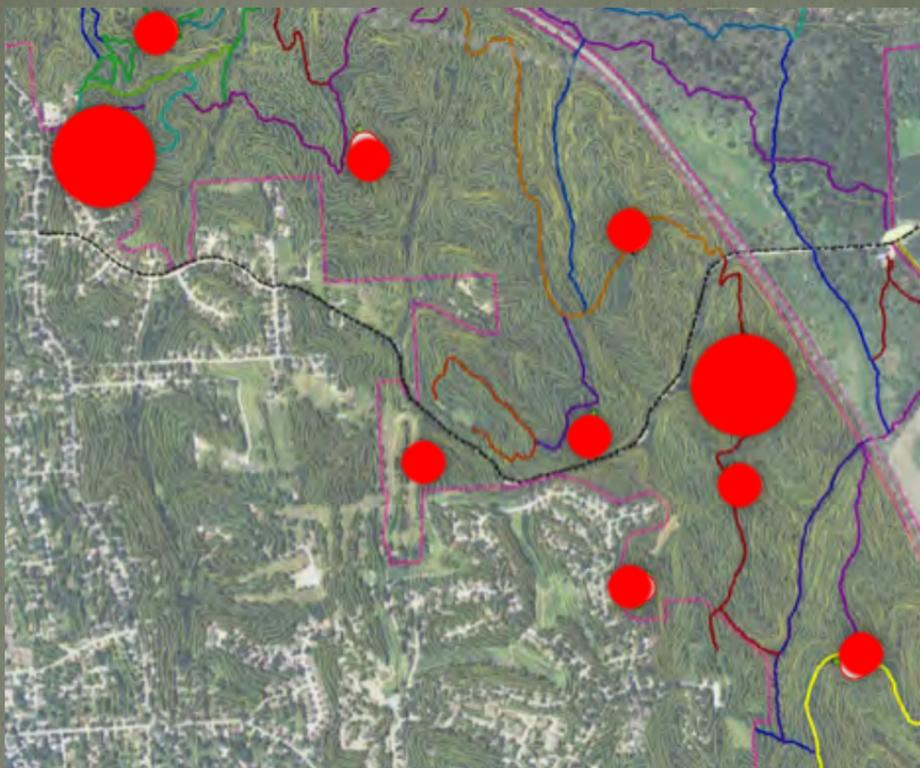
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Legal status: Problematic (Maack is not listed)

Habitat: Pastures, forest edges and other open areas.

Why is it here? Introduced from Eurasia for ornamental and soil erosion control.

Impact: Crowds native plants and releases chemicals that kill other plant species.



How does it move? Honeysuckle creates bright red fruits. These are attractive to birds, which carry them long distances.

Recent control discussion: Nebraska forest service recommends burning if honeysuckle are found in open fields.

# Tree of heaven

*Ailanthus altissima*



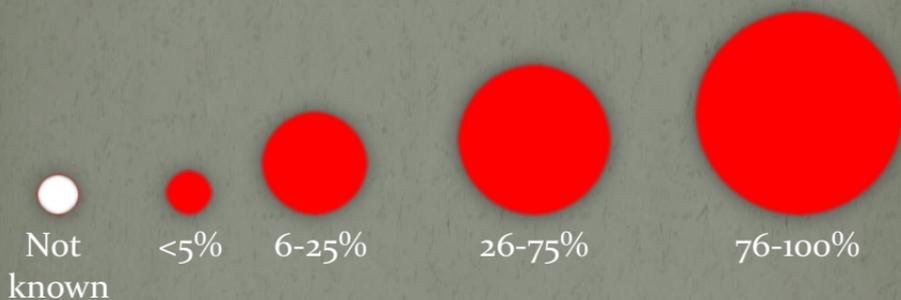
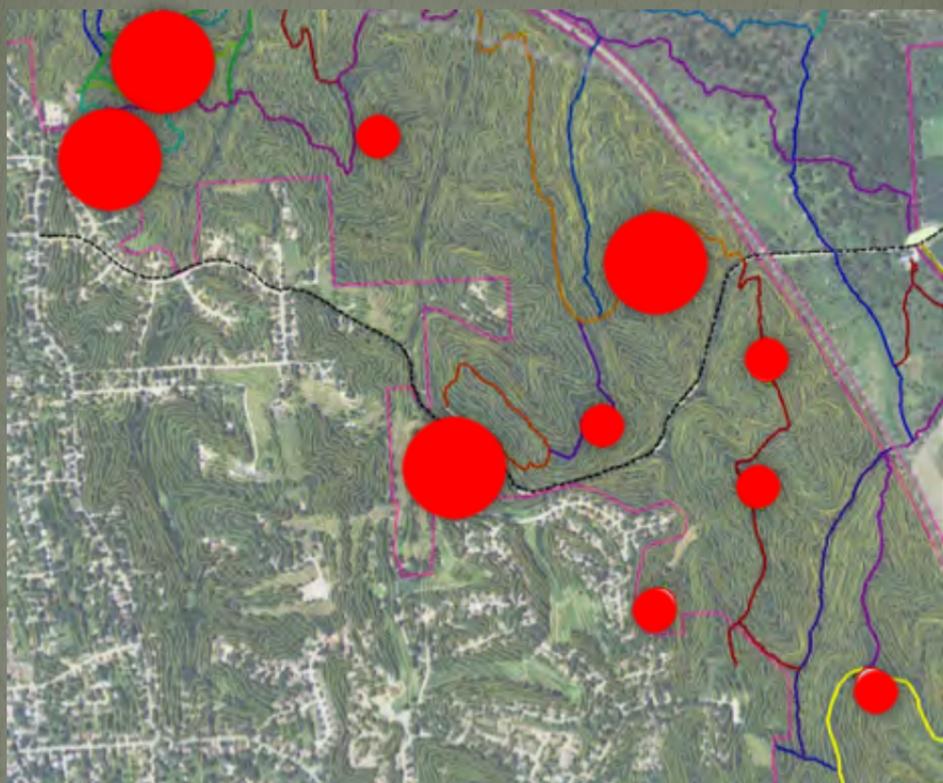
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Legal status: Problematic

Habitat: Best suited in full sun areas but is capable of surviving a very large range of soil types and sun exposure levels. Can resist drought.

Why is it here? Originating from China and Taiwan and introduced by a Pennsylvanian gardener in 1748.

Impact: Creates dense stands that crowd out native species. Produces a chemical called alianthone which acts as a pesticide to many plant species.



How does it move? Seed dispersal and re-sprouting. Cut or broken branches will re-sprout and grow into a new individual.

Recent control discussion: nps.gov says the best way to control this species is to target adult seed bearing female trees with hack and squirt or foliar applications of glyphosate.

# Eastern RedCedar

*Juniperus virginiana*



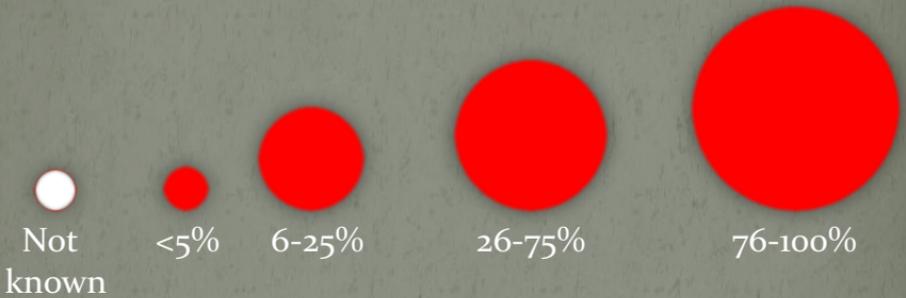
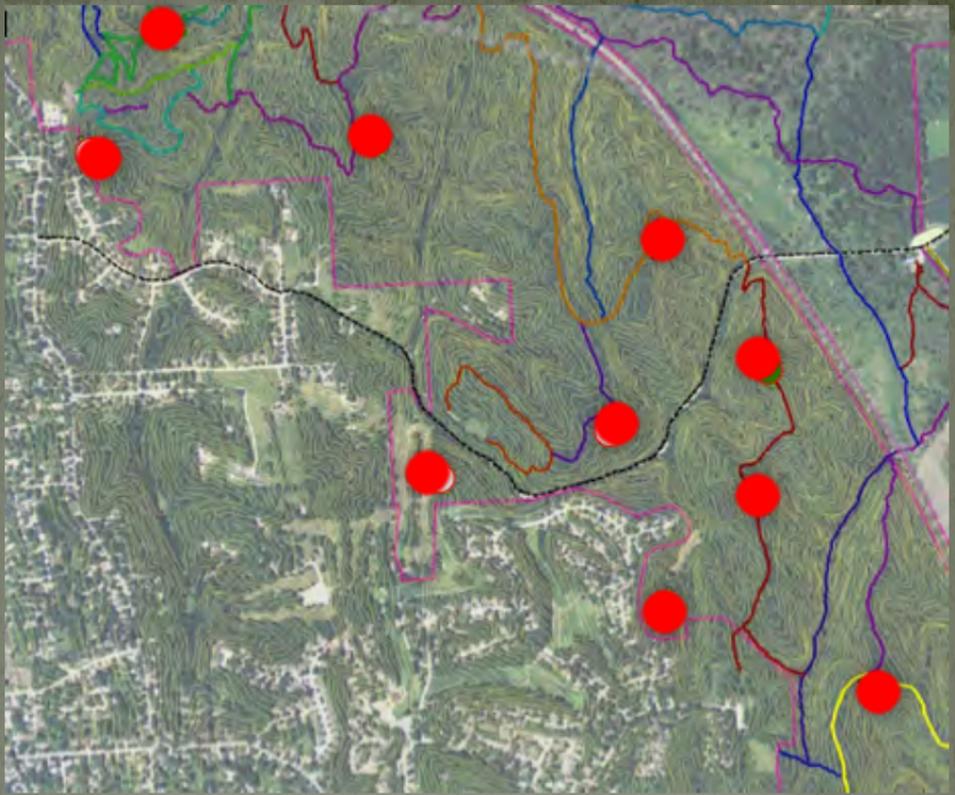
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Legal status: Problematic

Habitat: Rangelands and woodlands.

Why is it here? Native to Nebraska. Removal of natural fires from rangelands and planting of Redcedar for windbreaks has caused a rampant spread of this plant species.

Impact: Redcedar grows close to the ground making it impossible for other species to survive there. Slowly but persistently spreads, taking over a variety of habitats.



How does it move? Berries/seeds are windblown or eaten by a variety of birds and mammals and carried away. Roots can come above ground and form a new tree.

Recent control discussion: Prescribed burning is an effective control for eastern red cedar. Interns at Cedar Point Biological Station in Nebraska also mechanically control Redcedar with handsaws and chainsaws. If all pine/leaves are removed from the tree it will stop growing. Redcedar is often ignored because of its slow growth and movement.

# Multiflora rose

*Rosa multiflora*



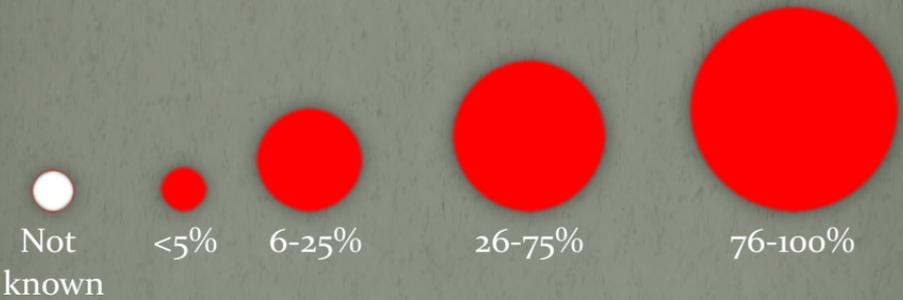
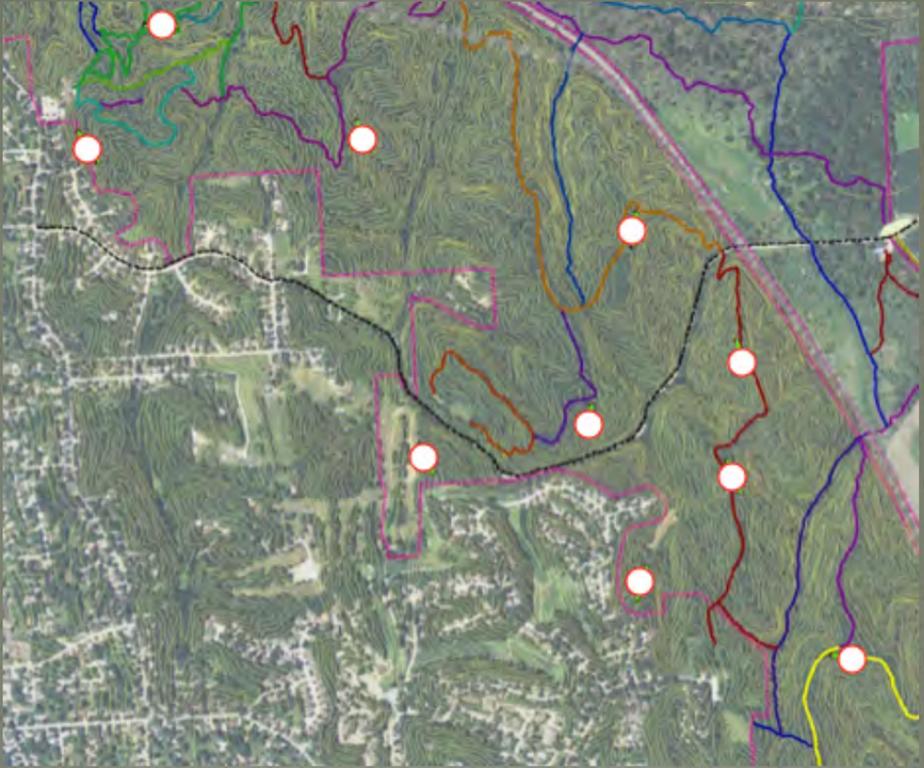
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Legal status: Problematic

Habitat: Partial sunny areas and well drained soils. Has been known to be successful in full shade.

Why is it here? Introduced from Japan as root stock in 1866.

Impact: Multiflora rose forms dense thickets which pushes out native plants.



How does it move? Roots can re sprout from the ground. Seeds can also stay alive and dormant in the ground for 20 years.

Recent control discussion: Amrine suggest multiple control options. One being exposing the rose to an eriophyid mite which carries a virus that causes rose rosette disease. This is very impactful way to control multiflora rose but can also effect other rose species.(6)

# Japanese siltgrass

*Microstegium vimineum*



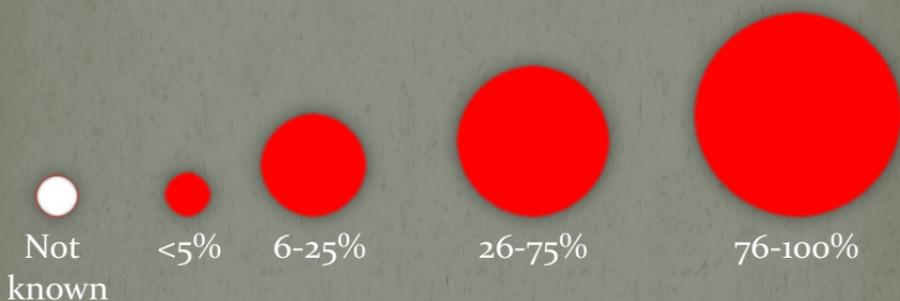
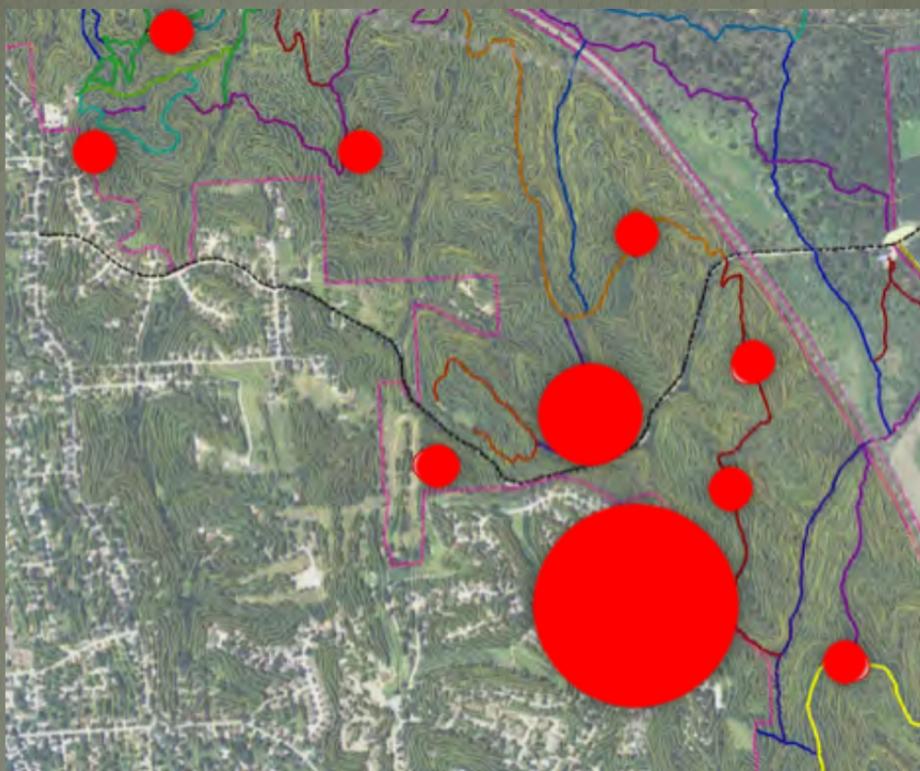
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Legal status: Not listed

Habitat: Siltgrass is found in almost any habitat in the U.S. but prefers moist areas.

Why is it here? Originally from Japan. Possibly introduced because Siltgrass was used to pack porcelain.

Impact: Has creeping habits which causes it to out crowd native species. Whitetail deer will forage on native species and not siltgrass causing a higher success rate.



How does it move? Seeds are carried by wind and waterways. Seeds often drop straight down and take the spot of the parent once it dies.

Recent control discussion: A study by Judge found that applying two applications of glufosinate would almost completely kill a single siltgrass plant.(12)

# Sweet clover – white and Yellow

*Melilotus alba* & *Melilotus officinalis*



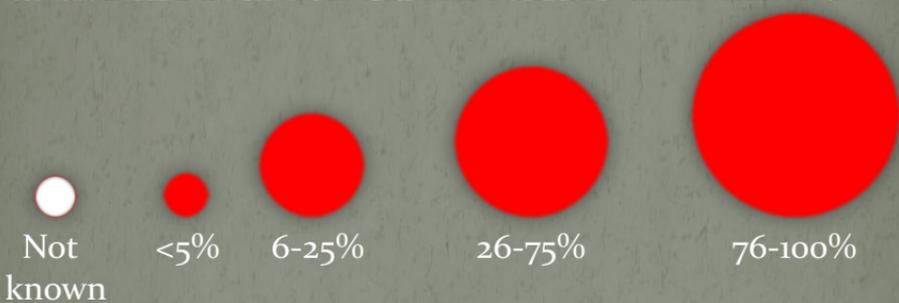
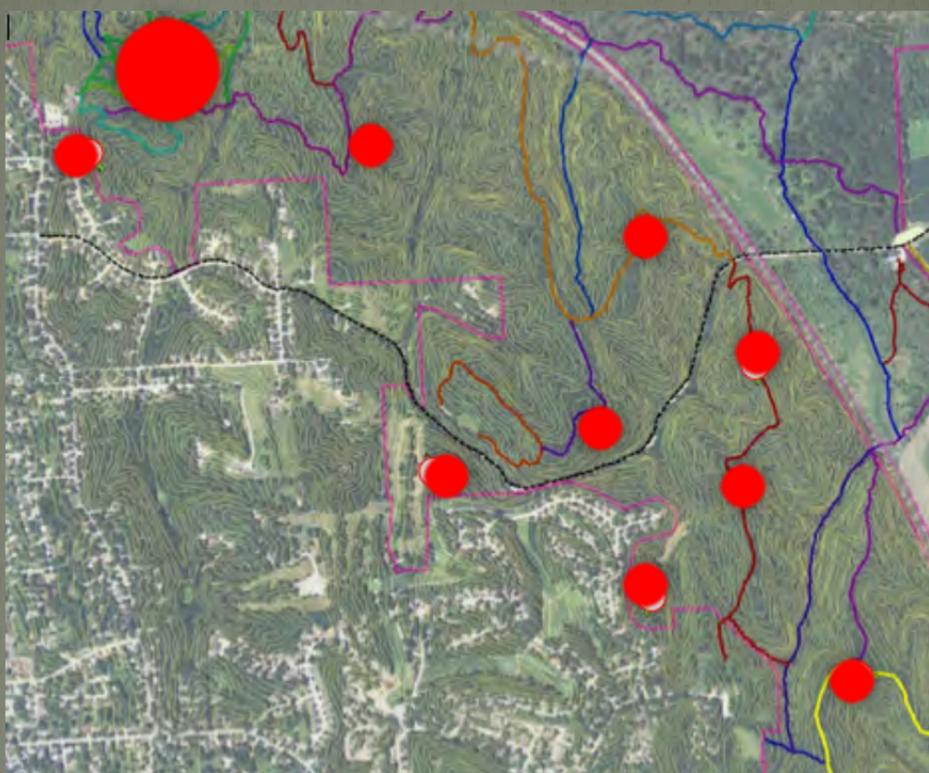
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Legal status: Not listed (not conclusive if *alba* & *officinalis* are different species)

Habitat: Waste areas, prairies, open fields and roadsides.

Why is it here? Introduced from Eurasia for cattle forage.

Impact: Takes over areas that have been disturbed. Do not allow for natives to grow back. Can fix nitrogen which makes them a good competitor.



How does it move? Clover spreads by reseeding itself.

Recent control discussion: Conn states that using herbicides is more effective at controlling clover than cutting or burning. Chlorsulfuron was found to eliminate seed production whenever applied. Burning and cutting just allowed for regrowth. (13)

# Dame's rocket

*Hesperis matronalis*



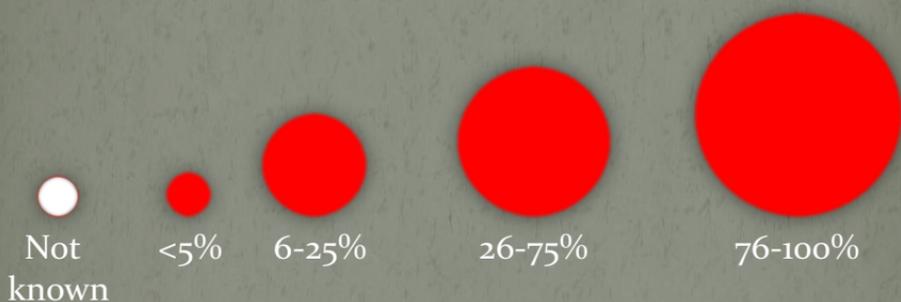
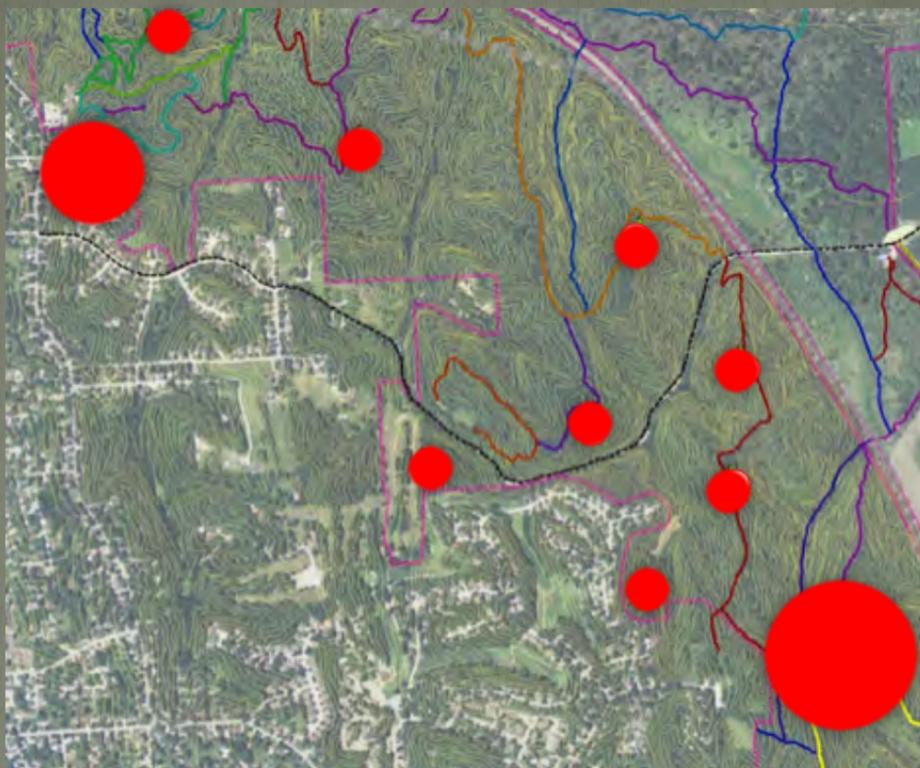
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Legal status: Not listed in Nebraska but Noxious and invasive in other U.S. States

Habitat: Partial sunny areas, fertile loamy soils and avoids acidic soil.

Why is it here? Dames Rocket was introduced in the 17<sup>th</sup> century from Eurasia as an ornamental plant.

Impact: Dames Rocket can compete with herbaceous plants at the edge of woodlands and inhibit seedling nutrient uptake.



How does it move? An individual plants can produce hundreds of tiny seedpods. These seeds spread by wind and animal movement. One seed can remain viable for years in the ground.

Recent control discussion: The Forest Invasive Plants Resource Center states that burning or foliar applications of glyphosate in the spring or fall is the best way to control Dames Rocket.

# Barberry

*Berberis thunbergii*



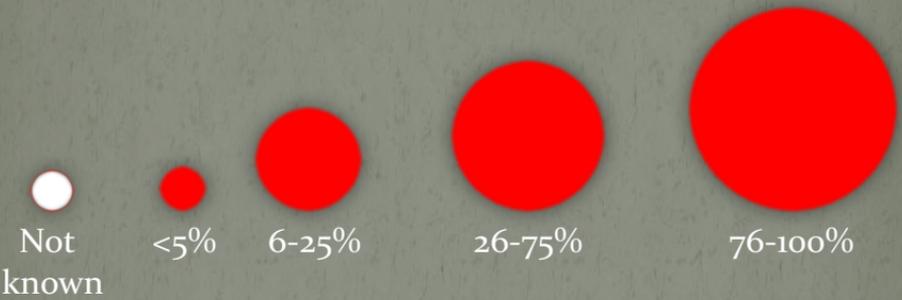
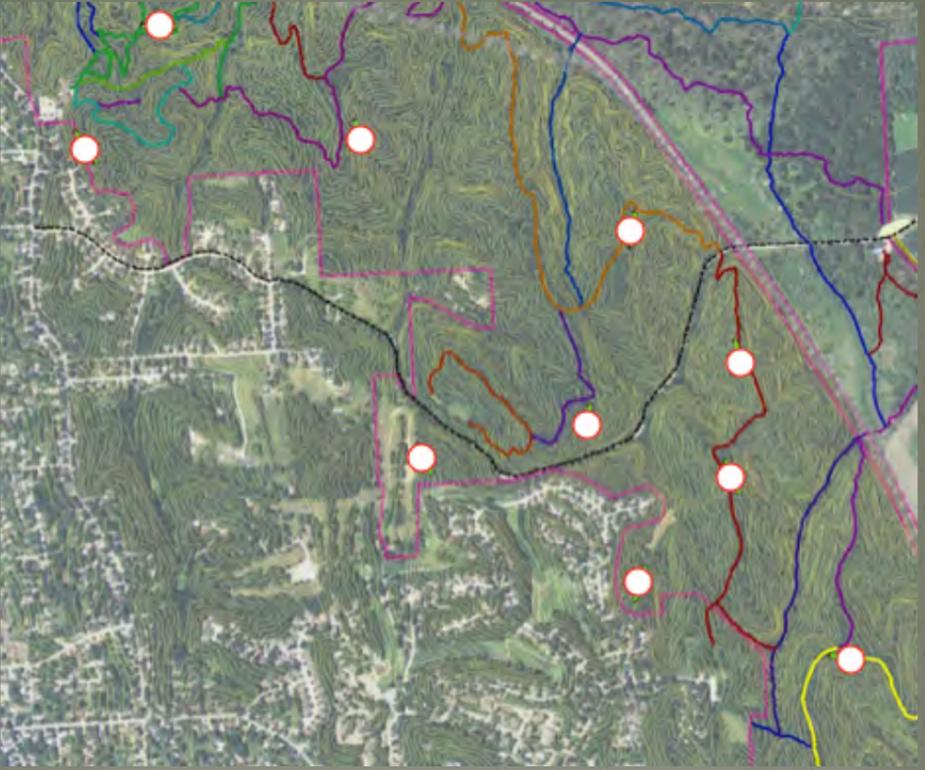
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Legal status: Not listed

Habitat: Closed canopy forests, open woodlands and wetlands.

Why is it here? Introduced to Arnold arboretum in Massachusetts in 1875. Later it was propagated for hedgerows in the eastern United States.

Impact: Leaf litter changes soil chemistry making it more basic. In the process Barberry displaces many native species.



How does it move? Large number of seeds produced every year. Turkey and grouse eat the seeds and spread them as they move.

Recent control discussion: Silander and Klepeis say that applying Glyphosate in the early spring, when it is one of the only plants with leaves, is a good way to control a barberry population.(3)

# Queen Anne's lace

*Daucus carota*



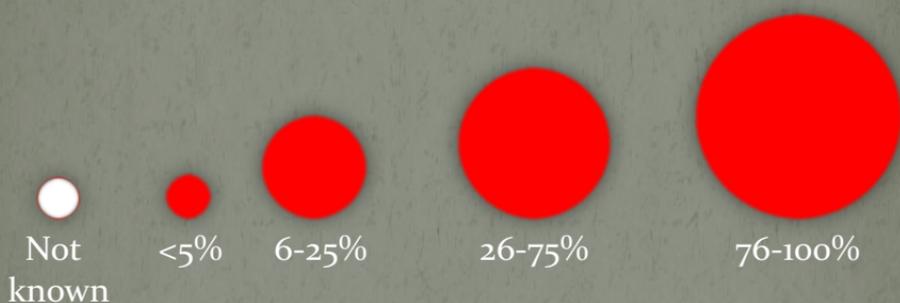
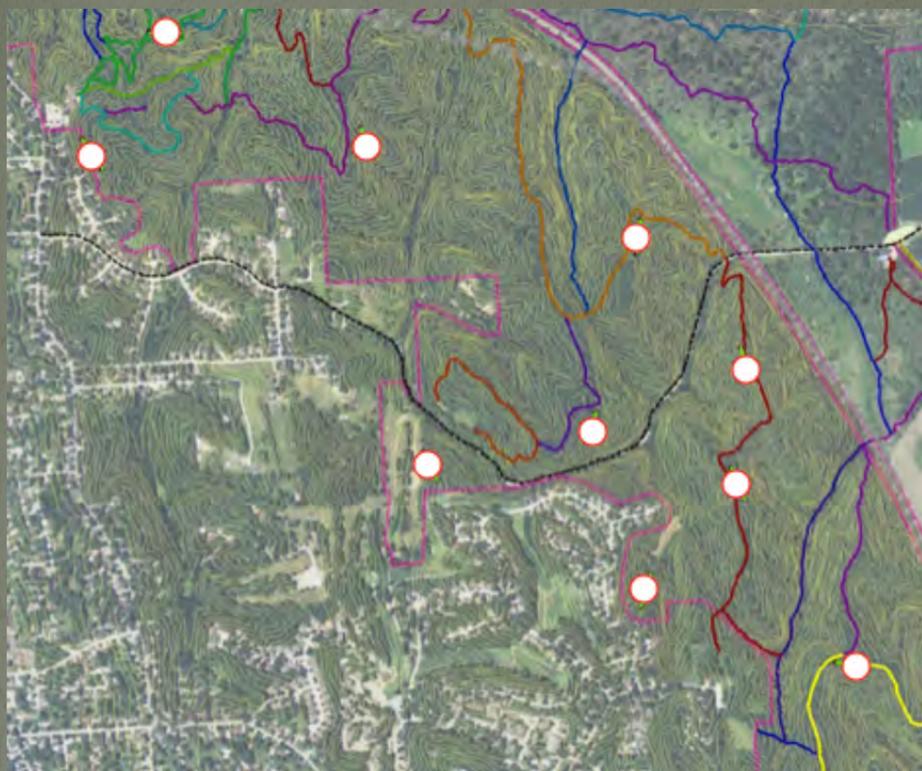
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Legal status: Not listed

Habitat: Weedy meadows, waist areas and along railroads. Grows best in full sunlight.

Why is it here? Introduced from Europe.

Impact: Queens Anne's lace is successful and can dominate species crowded areas. Successfully grows in disturbed areas.



How does it move? Seeds cling to the fur of mammals and to clothes.

Recent control discussion: Illinois wildflowers discusses how fire does not control for this species. The disturbance just helps Anne's lace. The population declines when there are no disturbances present.

# Reed canary grass

*Phalaris arundinacea*



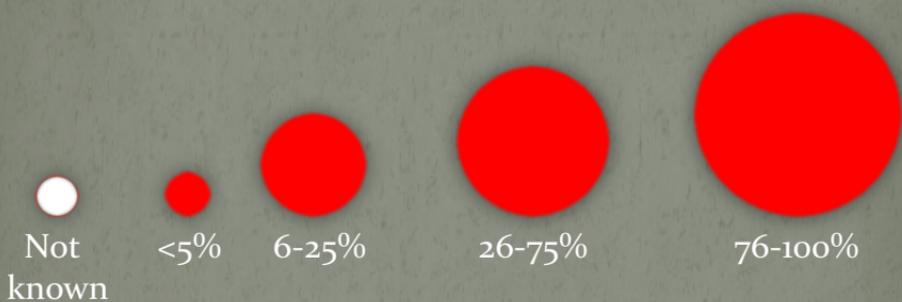
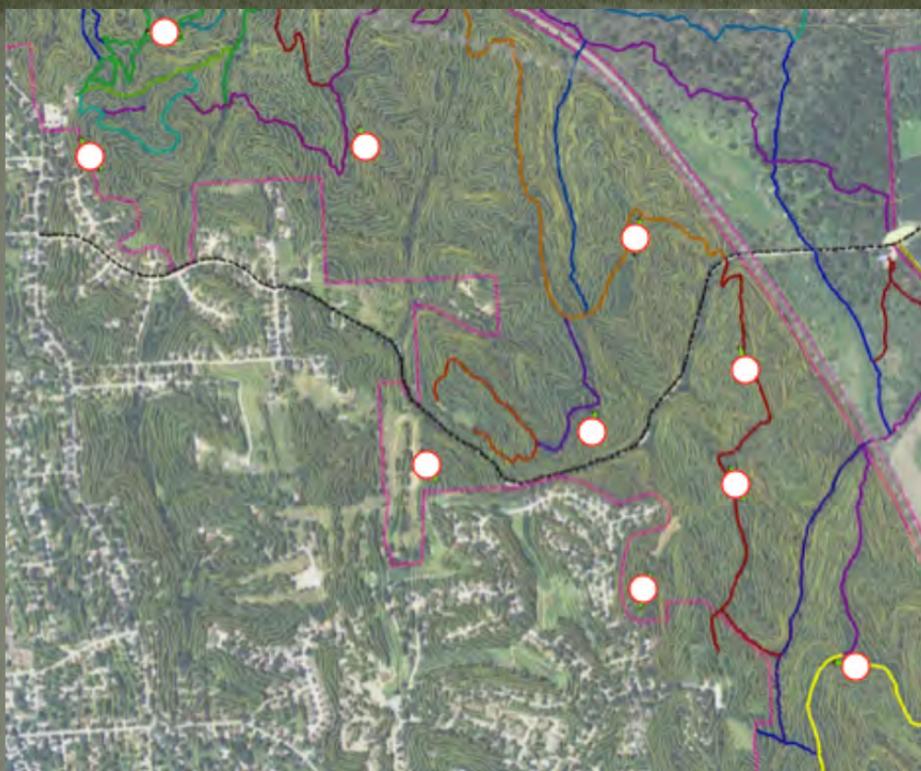
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Legal status: Not listed

Habitat: Marshes, wet meadows and prairie lowlands.

Why is it here? Evidence suggest it could be native to North America or introduced.

Impact: Reed Canary grass can interfere with water flow, reduce diversity and degrade wildlife habitat.



How does it move? Creeping rhizomes are successful in wet places. Seed dispersal by water also occurs.

Recent control discussion: Waggy claims that burning at the right time can be effective. Summer burning can help the species survive but late spring burning will reduce population size. Drought or lack of water will also negatively impact Reed Canary grass.(8)

# Methods

Species data was collected by Fontenelle forest staff. Staff established 10 non-random transects within the property each at a length of 100 meters. Transects were placed parallel to slopes and where vegetation seemed to be uniform. A 1 m<sup>2</sup> plot frame was always placed on the left side of the transect line every 5 meters. This resulted in 20 plots per transect. Plants found were identified to species if possible and recorded.

With the recorded data I calculated percent occurrence for each target species. This was done by first finding whether the species was present or not in a plot. The number of times present were summed, divided by 20 (for the number of plots) and multiplied by 100 to change the value from a decimal to a percent.  $((\text{sum})/20*100)$ . These values are represented by different sizes of circles shown on the map for each species.

The species that were chosen for this handbook came from which invasive species Fontenelle has found on their property. Some of these species were not recorded when monitoring was done. These individuals are represented with a white circle on each species map.

# Acknowledgements

I would like to thank my AGRO 444 class, especially Dr. Twidwell and Tori Donovan. Without them this project could not have been completed.

Thank you to Fontenelle Forest management and staff for their hospitality and generosity of their time and property.

Recommended citation: Wagner, Jacob L. *Invasive Plants Field Guide: Fontenelle Forest*. University of Nebraska, 2017.

Authorship: Jacob Wagner

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