



North Country Cooperative Invasive Species Management Area



401 N. Lake Street

Cadillac, MI 49601

www.NorthCountryInvasives.org

Fighting Invasives, Protecting Assets, Restoring Habitats

Invasive Species Management Plan – City of Ludington

Overview: Invasive species within the City of Ludington have significant impacts, creating hazards by blocking sight line views for motorists, degrading infrastructure like roads and foundations, and reducing the quality of natural areas by outcompeting beneficial native species.

While these species have been present in the city for years, sold by greenhouses in the recent past and commonly found in landscaping, their prolific spread and impact has become apparent. North Country CISMA first began working with the City DPW in 2018 when the DPW Manager became concerned about the growth of invasive species along City alleys, which had encroached and overgrown to such a level that emergency responder vehicles would not be able to access these areas.

The City of Ludington is impacted by three primary invasive species; Japanese knotweed, Invasive bittersweet (also called oriental bittersweet), and tree of heaven. Each species is impactful in different ways, and is outlined below with a short species description and image.

Japanese knotweed: An aggressive growing perennial plant that can reach up to 15 tall in a single year. Stalks resemble bamboo. It's powerful and extensive root system can damage home foundations and roads. Cutting the plant only worsens the problem, with prolific regrowth and spread resulting. Cut stalks can root and establish entirely new patches. Can take several years of treatment before infestations are under control.



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Invasive bittersweet: is an aggressive, fast-growing vine which coils around trees, shrubs, and any other available support. Leaves have finely toothed edges with a pointed tip and sometimes appear glossy. Leaves turn yellow in fall and stay attached until late in the season. Distinctive berries are red with a yellow outer skin that splits open when the berries are ripe. The vine girdles trees, preventing them from transporting nutrients, and eventually killing the plants. It grows rapidly and can shade out the vegetation that supports it. Bittersweet vines can add extra weight and tangle powerlines, creating safety concerns. The added weight of vines in tree canopies leaves them more susceptible to ice and wind damage.



Tree of heaven: Long leaves composed of many leaflets, similar in appearance to native sumac or black walnut. Leaflets have smooth edges except for a single toothed-edge near the base. Leaves have a distinctive peanut butter smell when crushed. Tree of heaven was used for years as a popular urban landscaping tree as it is able to tolerate a wide range of sun and soil conditions. Tree of heaven has an extensive root network, with prolific resprouting occurring when a tree is cut or injured. Tree of heaven roots can impact home foundations and creates extra maintenance costs for infrastructure like powerlines and roadway sight lines.



2024 Invasive Species Survey Work

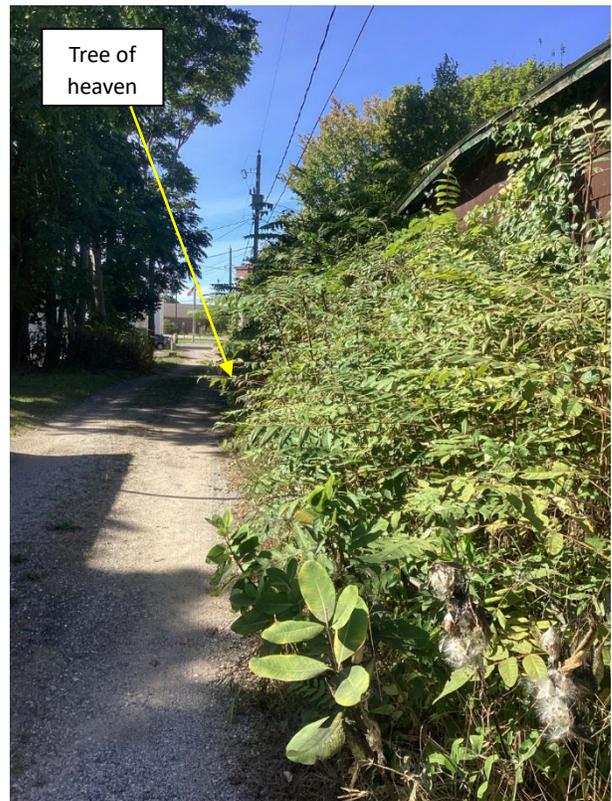
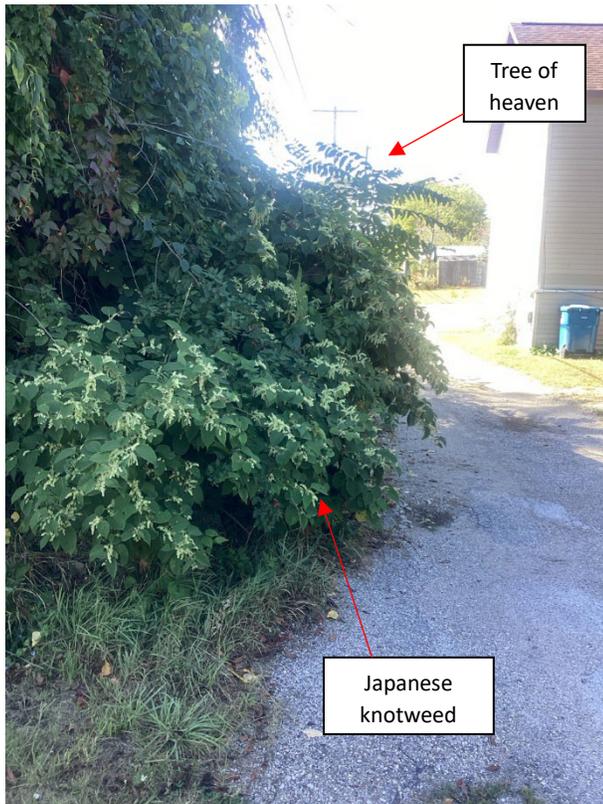
In 2024, North Country CISMA staff worked with several volunteers to survey and map all infestations of Japanese knotweed, invasive bittersweet, and tree-of-heaven within the city. Surveys were conducted from City roads and alleys, with staff recording data on GPS enabled Ipads that noted which specific parcels were impacted. Survey results are outlined below.

Total infested parcels: 753 parcels (many contain multiple invasive species)

- Invasive bittersweet: 511 parcels
- Tree of heaven: 470 parcels
- Japanese knotweed: 24 parcels

Maps of the survey results are included at the end of this management plan, with separate maps for each species. Additionally, maps of the individual wards for each species are included.

Photos from the surveys of several impacted areas are shown below:





Management Prioritization, Goals and Landowner Assistance

The magnitude of infestations present for the species surveyed makes it necessary to prioritize sites, rather than tackle all infestations at once.

- 1.) Because Japanese knotweed poses a significant threat to infrastructure, and only 24 occurrences were found within in the city, this should be considered the top priority for control. Knotweed has a disproportionate impact, creating significant infrastructure concerns even though it is far less widespread than bittersweet or tree of heaven. While several years of follow-up control is necessary to achieve management of Japanese knotweed, the low number of occurrences within the city make it a “winnable battle”
- 2.) Tree of heaven and invasive bittersweet control at Cartier Park – Cartier Park was the site of a large grant project where North Country CISMA staff managed tree of heaven, bittersweet, and several other invasive species between the dog park and gazebo. 600 native wildflowers and hundreds of trees were planted in this showplace area where the invasive species control was conducted. Ensuring that past management efforts are not reclaimed by resprouts of tree of heaven and bittersweet is critical in preserving the native species planting efforts conducted at the park.
- 3.) Tree of heaven (470 impacted parcels) and Invasive bittersweet (511 impacted parcels) are considered widespread and established within the City. Management costs and time associated with staff from North Country CISMA addressing these two species would exceed \$300,000 for control in 2025, with follow-up control in 2026 projected to be around the same amount. Management of these species will be best accomplished through education and outreach. By informing landowners about the negative impacts that these species have on the community, and providing education on the proper ways to effectively control them, landowners will be able to be stewards of their own land. Residents that want to have the species controlled, but do not want to do it themselves, can participate in North Country CISMA’s At-Cost treatment program. The program provides free quotes for control work, which is performed at-cost, and allows residents to have their invasive species managed by a licensed and certified invasive species manager. North Country CISMA also has a list of local contractors with expertise in invasive species management. North Country CISMA’s at-cost treatment program is not intended to compete with local contractors, but to offer affordable control for treatment sites that are small, and typically cost prohibitive for a private contractor to perform treatment at.

Utility Line Right of Way Management

Numerous infestations of invasive bittersweet and tree of heaven were noted to be impacting utility lines. Utility line vegetation clearing occurs in cycles, ranging from 3-15 years depending on the area and site-specific needs. While utility managers conduct best management practices

for their allowed right of way, they rarely cross that boundary, or return the following year to conduct control of the resprouts.

Both invasive bittersweet and tree-of-heaven will produce a prolific amount of root sprouts when cut and left untreated. Even when treated with an herbicide, both species will still produce some resprouts, which require follow-up control. Additionally, when patches of bittersweet and tree of heaven cross outside of the ROW, the remaining infestation on private property is left untreated, allowing for the plants to quickly re-infest the utility pole.

In order to achieve meaningful control of invasive species in utility right of ways, North Country CISMA has been working with regional utility managers to identify ways to fill in these gaps. Contact NCCSIMA for an update on utility line management collaboration.

DPW Staff Training

In order to legally apply pesticides in the State of Michigan, paid staff need to be a licensed pesticide applicator with the Michigan Department of Agriculture and Rural Development (MDARD). Staff must study the test prep book and pass State exams to get licensed. Information regarding the testing and licensing process can be found on MDARD's website, but can be confusing at times. North Country CISMA is able to answer any questions about the process, as well as provide guidance for proper management techniques, rates, and times of year to address invasive species.

Invasive Species Management Workplan for 2025

Outreach efforts to City residents regarding the impacts that invasive species pose, as well as how to safely and effectively manage these species is a key component of North Country CISMA's 2025 Workplan with the City of Ludington.

- 1.) Provide control of all 24 Japanese knotweed infestations in the city. Infestations impacting City infrastructure or posing safety concerns (blocking site line views for motorists) will be at zero cost to impacted property owners. City of Ludington will cover 50% of treatment costs for Japanese knotweed infestations that do not meet the criteria for free treatment.
- 2.) Conduct social media outreach regarding the impacts that invasive species have on the community, how to effectively manage invasive species, and how to safely and properly use herbicide.
- 3.) Assist property owners impacted by tree of heaven and invasive bittersweet through North Country CISMA's at-cost for hire program, or through treatment training for those wishing to control species themselves
- 4.) Provide ID and treatment training for Ludington DPW staff

- 5.) Host an educational workshop for invasive species ID and control on May 8th, 2025
- 6.) Conduct treatments of tree of heaven & invasive bittersweet to maintain native plant restoration area at Cartier Park
- 7.) Conduct invasive bittersweet control along the paved walking path at Cartier Park
- 8.) If work is completed under the budgeted amount, remaining funds will be utilized to conduct control of tree of heaven where it poses sight line concerns, impacts ROWs, or is damaging city infrastructure

Invasive Species Management Workplan 2026 – future

- 1.) Re-treatment of all Japanese knotweed infestations within the city. Re-treatment can be conducted through trained DPW staff, through North Country CISMA's at cost program, or by a private contractor.
- 2.) Re-treatment of invasive bittersweet and tree of heaven at Cartier park through treatment trainings for volunteer groups.
- 3.) Host educational treatment workshops for City of Ludington residents to train on safe and effective control methods for tree of heaven, invasive bittersweet, and Japanese knotweed.
- 4.) Work with Consumers Energy and other Utility Line management agencies to collaborate on control and ensure best management practices are being implemented in the city, helping to prevent the spread of these species and ensure they are controlled properly
- 5.) Continue to seek out grant funding (Community foundation, Consumers Energy Foundation, Michigan DNR, Urban Forestry, US Forest Service, US EPA) to help offset invasive species management costs within the city

Contact information

Zach Peklo
Program Coordinator, North Country CISMA
231-429-5072
Zach.peklo@macd.org

Michael Ramsey
Public Engagement Specialist, North Country CISMA
231-577-9479
Micahel.Ramsey@macd.org

Herbicide Safety

Herbicides are an effective tool that can be used safely. It is the responsibility of the herbicide applicator to read the herbicide label. The label is the law! Herbicide labels contain important information regarding how to apply the herbicide, safety precautions, storage requirements, and much more. North Country CISMA has an informative herbicide safety video available at [YouTube.com/NCCISMA](https://www.youtube.com/NCCISMA).

Species Specific Treatment Methods

North Country CISMA has treatment demonstration videos available at [YouTube.com/NCCISMA](https://www.youtube.com/NCCISMA), covering the species of Japanese knotweed, invasive bittersweet, Phragmites, Autumn olive, spongy moth (formerly called Gypsy moth), and European frogbit.

Japanese knotweed (large patches)

- Method: foliar spray (spraying the leaves of the plant)
- Timing: July – September
- Equipment: Hand held or backpack sprayer
- Herbicide and rate: Milestone (aminopyralid). 0.4 ounces per gallon
- Surfactant (also called sticker agent): Cygnet plus. 1.25 ounces per gallon
- Dilutant: Water
- Notes: Apply to all leaves of the plant, plants will die in place and can be removed the following year

Japanese knotweed (small patches)

- Method: Stem injection
- Timing: July – September
- Equipment: Knotweed injection tool
- Herbicide and rate: AquaMaster (glyphosate). Undiluted, 128 ounces per gallon
- Surfactant and rate: None
- Dilutant: none
- Notes: Inject each stalk roughly 3-4 chambers from the bottom.

Tree of heaven (trunk size larger than 6 inches diameter)

- Method: Hack and Squirt

- Timing: July – September
- Equipment: Hatchet and handheld sprayer
- Herbicide and rate: AquaMaster (glyphosate). 64 oz per gallon (50% concentration mixture)
- Surfactant and rate: none
- Dilutant: Water
- Notes: at roughly chest height, cut into the trunk of the tree at a 45 degree angle. Cuts should be deep enough to penetrate the outside bark and into the tree roughly 3-4 inches. Cut all the way around the tree, but do not make cuts connect. Leave some gaps between cuts. Spray the herbicide mixture into the cut. The 45 degree angle will allow the herbicide to be contained and not flow out.

Tree of heaven (trunk size smaller than 6 inches diameter)

- Method: Basal bark spray (spraying of the trunk 8-18 inches from the ground)
- Timing: July (ideally the hottest part of the summer)
- Equipment: Handheld or backpack sprayer
- Herbicide and rate: Garlon 4 (Triclopyr). 25.6 ounces per gallon
- Surfactant and rate: None
- Dilutant: Methylated seed oil, kerosene, diesel
- Notes: Spray the mixture all the way around the trunk of the tree, from roughly 8 inches above the ground to 18 inches above ground)

Invasive Bittersweet (large amount of small stemmed plants along the ground)

- Method: Foliar spray
- Timing: July – September
- Equipment: Handheld or backpack sprayer
- Herbicide and rate: AquaMaster (Glyphosate) at 2.5 ounces per gallon AND Vastlan (triclopyr) at 1.25 ounces per gallon.
- Surfactant (also called sticker agent): Cygnet plus. 1.25 ounces per gallon
- Dilutant: Water
- Notes: Apply to all leaves of the plant, plants will die in place and can be removed the following year

Invasive bittersweet (large stems growing up into trees or small area of small stems)

- Method: Cut stump treatment
- Timing: July – September
- Equipment: Handheld sprayer and saw/pruners/chainsaw
- Herbicide and rate: AquaMaster (Glyphosate) at 64 ounces per gallon
- Surfactant and rate: none
- Dilutant: Water
- Notes: Apply to freshly cut stump. Using a paint brush can help be more targeted to the stump to prevent off target damage.