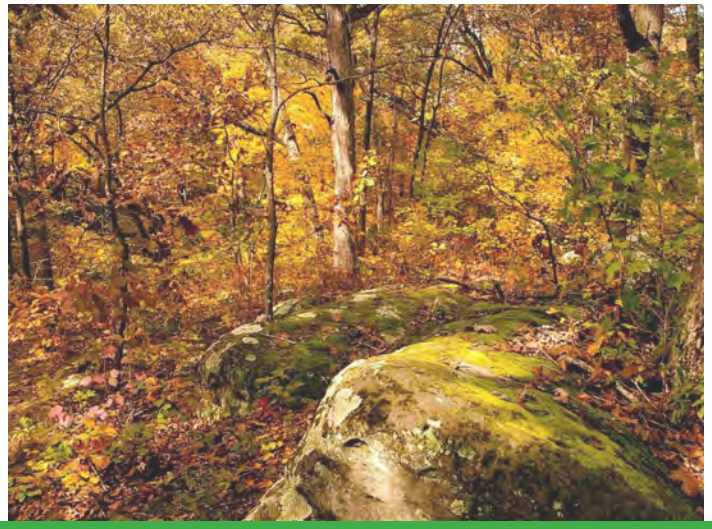
NICHES Land Trust

Volunteer Steward Guide



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How We Started

NICHES was founded in 1995 by a small group of volunteer citizens concerned with the conservation of our local ecosystems. We actively seek to protect and steward a wide range of highly connected natural areas to serve both as habitat for a robust diversity of local flora and fauna as well as sanctuaries for the education and inspiration of the public.

NICHES is non-adversarial; we work cooperatively with land owners, other non-profit organizations, government agencies, and various state / local entities to realize our mission.

Who Are We?

NICHES Land Trust is a non-profit organization headquartered at Clegg Memorial Garden in Lafayette, Indiana. Our mission is to restore and protect northern Indiana's ecosystem while nurturing a sense of ecological knowledge and appreciation within the community. We manage public conservation land covering a wide range of habitats across northern Indiana. We strive to offer educational and outreach opportunities within our 13 county service area. We are able to do this because our organization is deeply tied to a local community whose generous donations of time, dollars, and land allow us to function as a unique and valuable resource.

NICHES stands for Northern Indiana Citizens Helping Ecosystems Survive, and true to our name we rely on the support and investment of our local communities to help make the most positive, far-reaching, and comprehensive impact on our local ecosystems as possible. Every year hundreds of volunteers from all walks of life step up to lend a hand in protecting our greatest natural heritage. If you are reading this now then you are taking the first step to joining our fight of leaving a healthy and thriving biological legacy for future generations to cherish and find fulfillment in, thank you!

Volunteer Information

This booklet was created to facilitate the identification and management of invasive species in west central Indiana.

The encroachment of invasive species in our prairies, fields, and forests is perhaps one of the greatest threats to the biodiversity and stability of our native ecosystems. The stewardship of our local natural heritage is a responsibility that we all share, and it is up to us to provide invasive free areas so that our native plants and animals may flourish. NICHES protects, restores, and rehabilitates nearly 4,000 acres of natural area in west central Indiana.

Calendar of Stewardship

SEPTEMBER TO NOVEMBER

Seed collection: Seed collection involves the harvesting of seed heads from various native grass, sedge, or wildflower plants to use in future restoration projects. NICHES gathers seeds from a seed source as close to the restoration as possible to protect the integrity of local genomes. Seed gathering protocol is to collect ~1/3 of the seed population, thereby protecting the seed bank viability at the locale. Seed gathering dates vary depending on the maturity of seed. Some plants set seed early and mature to collection by mid-summer (generally spring woodland flowers), but most seeds do not mature until fall, which is why a bulk of seed gathering happens between September through November. Seeds are harvested by hand and gathered into "breathable" plastic / fabric bags or large manila envelopes. Once seeds are collected they go to NICHES stewardship managers for stratification, storing, and eventual disbursement. Some are even planted in greenhouses and the sprouts are tended until mature enough to plant in the restoration location. Seed collecting requires minimal physical labor, though being able to move about freely off trail, grasp and release, and often bending are required. Seed collecting is a family-friendly activity.

Tree Planting: Tree planting involves digging holes and planting saplings to restore or maintain a diversity of woodland habitats. Tree planting requires moderate to heavy physical labor, as volunteers dig the holes with hand shovels and carry crates of native tree saplings to off-trail locations.

Honeysuckle removal: Honeysuckle removal involves the hand pulling of small plants or the cutting and applying of spray herbicide. Volunteers either use a handheld spray bottle or wear a specially designed backpack sprayer with a long handle nozzle to spray herbicide directly to the cut stump of invasive honeysuckle species. A NICHES representative will work with individual volunteers to teach plant identification and spray techniques to ensure the volunteers know which plants to treat and how to efficiently and effectively apply the herbicide. If plants are small enough to hand pull, the plants need to be hung from crooks in trees or piled so they do not re-root. Volunteers also need to be cautious when hand pulling plants to ensure that they are not significantly disturbing the soil (extensive soil disturbance actually helps progress a honeysuckle infestation). Sometime the honeysuckle infestation is so advanced, that the dead honeysuckle from previous treatment still clog the understory, at which time those dead shrubs need to be gathered and hauled into piles (and preferably burned if conditions permit). Late fall and winter are excellent times for hauling and burning brush. When burning brush, NICHES volunteers are required to have a fire rake and water pack on site to reduce the chance of the fire spreading to an unintended area (contact NICHES Volunteer Coordinator to pick up a rake and water pack). The removal of downed honeysuckle allows NICHES stewards and volunteers to easily navigate through a property in the spring to treat or pull any resprouts. Honeysuckle treatment and removal involves moderate to heavy physical exertion.

NOVEMBER TO FEBRUARY

Burn Break Preparation: Burn preparation involves creating wide paths free of combustible fuels to serve as the edge of a burn unit for controlled burns. A burn break is a swath of land, twice as wide as expected flame lengths, free of any natural fuel or debris. Preparing burn breaks involves mowing, raking, leaf blowing, hauling brush, and cutting down dead standing trees that could potentially alight and fall across the break. The work involved and the width of the break varies depending on the habitat type. A NICHES burn boss determines the specific burn break requirements and assigns tasks accordingly. Burn season occurs in October / November and February / March, with a majority of burns occurring during March. November to February are great times to prepare fire breaks in preparation of the March burn season.

OCTOBER & MARCH

Controlled Burning: Controlled burning is a land management technique that involves the careful and coordinated reintroduction of fire to a natural habitat. Fire is dropped from a torch containing specially blended petroleum fuel. When the fire lands on the ground in the burn unit, the natural fuel alights. Natural fuel is comprised mainly of oak / hickory leaf litter and debris in the woods and dried grasses / sedges in a prairie or savannah. Each controlled burn is led by a professional burn boss, professional burn crew, and support volunteer burn crew. The burn boss assigns tasks to burn crew members in order to ensure a safe and effective burn. Burn crew tasks include: dropping fire from a handheld torch and tamping flame (to put out fire lines at the edge of a unit). This is completed with a handheld tool called a “flapper”, using a water pack (with 5 gallons of water) to extinguish any flames that jump across the fire break, observing site lines, smoke monitoring, and mop-up (ensuring the burn is out and not a threat for flare-ups). Burn crew members are on an ‘on-call’ email list. Controlled burns are only conducted in the correct weather conditions, so burn crew volunteers generally receive 24 to 48-hour notice of a burn. Burn volunteers receive training at a burn program workshop held by NICHES. If you are interested in becoming a regular burn volunteer we suggest attending the next scheduled burn training event. Burn crew involves moderate to intense physical exertion and carrying heavy weight.

APRIL TO MAY

Garlic Mustard Removal: Garlic Mustard hand pulling involves the weeding of the invasive plant species garlic mustard (See page 21 for garlic mustard identification). The plants are pulled out, including the roots, before they have an opportunity to set seed. Always grab the plant by the base of the stem to ensure that the entire root is pulled from the ground. By pulling the biennial plant before it sets seeds, we drastically reduce its contribution to next years seed bank, which helps eventually remove it from an ecosystem. Garlic mustard pulling is conducted both at organized work-days and as a lone task (meaning a trained individual can visit a site and pull garlic mustard on her / his own time.). Weed pulling involves bending, kneeling, and sufficient arm strength to pull the root out of the ground. It is a family-friendly activity and requires minimum to moderate physical exertion.

MAY TO JULY

Queen Anne’s Lace removal: Similarly, to the removal of garlic mustard, Queen Anne’s lace hand pulling involves the weeding of a locally invasive plant (see page 21 for Queen Anne’s Lace Identification). The plants are pulled out

by the base (including the roots) before they have an opportunity to set seed, which greatly reduces their competitive advantage over other natural grasses and wildflowers.

AUGUST / SEPTEMBER

Stream clean-ups: Stream clean-ups involve the removal of trash from access points to streams or from the stream bed itself. Trash removal can be as simple as gathering empty food and beverage wrappers, to as intensive as hauling a submerged rubber tractor tire from the stream bed. To participate in one of our creek clean-ups, subscribe to our monthly e-newsletter or stay tuned to our website / Facebook page for scheduling info. Physical exertion ranges from minimum to heavy. Stream clean-ups are family-friendly activities.

MARCH TO NOVEMBER

Trail maintenance/care of wood signs, railings, bridges: Trail maintenance involves keeping walking/hiking trails free of debris, flat, safe and in good condition. Trail maintenance often involves physical labor such as shoveling, raking, pushing a wheel barrow, using hand saws, pruners, or other tools. You can choose to "adopt" one of our hiking trails and will be responsible for mowing grassland areas and removing downed woody debris from the woodland areas, or you can join our Clegg trail workdays that take place every Saturday during the growing season at Clegg Memorial Garden in Lafayette (See website for details).

YEAR-ROUND

Trash removal: Trash removal can be as simple as gathering empty food and beverage wrappers or as intense as hauling heavy objects. Certain properties have areas with dumps that would require the use of a pickup truck and potentially multiple volunteers assisting each other. Trash pick-ups are family-friendly activities.

Fence Removal: As NICHES strives to connect habitats together, we are presented with the issue of removing internal property fences. This volunteer task can be completed year-round and requires thick gloves / clothing and wire cutters. Through coordination, NICHES staff can direct individuals or volunteer groups to areas with fencing and provide the tools necessary for its removal. After removal, fencing can be bailed up and recycled.

Special Projects

Featured below is a list of special projects that volunteers can undertake independently or in self organized groups.If you are interested in starting a project, contact us and we will help get you / your group started! Contact information is located on page 23 of this guide.

Lead your own volunteer workday – Work with our Volunteer Coordinator to set up, promote, and supervise a public workday at one of our properties. If you have the time and schedule flexibility, you can set up an individual, quarterly, or re-occurring monthly / bi-monthly workday on a property. Tasks will follow the general calendar of stewardship outlined in the preceding pages. Learn stewardship skills and help pass that information on to other volunteers. This will require passion and reliability since you will be directly representing the organization.

Become a site steward - This is essentially adopting some of the stewardship tasks for a property. Help remove invasive species throughout the year, prep the property for the spring burn season, maintain trails / access points, and work with our land stewards to move the property in the direction we'd like to see it. Site stewards can select what level they would like to participate in a property, even just a few days of work a year can take a significant burden off of our land stewards!

Lead public nature hikes - Lead tree identification or spring wildflower walks at Clegg Memorial Garden. Public speaking skills and knowledge of local flora / fauna is required for ID hikes. Volunteers can also use their creativity to lead a range of interpretive hikes, including presentations on local history, poetry, conservation, etc. We will work with you to help locally promote your hike!

Attend public outreach events – Represent the work and mission of NICHES at local public outreach events like career fairs and farmers markets. Help discover and recruit new members and volunteers!

Help promote events - Assist in promoting NICHES volunteer opportunities and events through different public outlets. Help hang up flyers, write PSA's for radio, and contact local news outlets.

Write articles / make creative content – Write short articles that share NICHES land trust stories and mission with the public (requires computer skills and writing ability). Articles can cover a wide range of conservation / nature related topics, creativity, and new perspectives on topics are encouraged! All stories must be proofed by NICHES Land Trust staff. Stories / articles can be featured in our monthly e-newsletters, quarterly member newsletters, social media, and various local publications. Other forms of creative content that can be shared through our outreach channels include nature / conservation inspired artwork, sketches, videos, poetry, recipes, and the list goes on. The goal is to encourage the public to participate in thoughtful expression and interaction with the natural world. Our continued protection of local ecosystems relies on a community of people who are invested in it!

Create booklets / brochures / library displays – Craft visually engaging, accurate, and relevant print media. Requires computer skills, writing skills, and graphic design skills. Content can range from junior ranger activity pages to stewardship guides like the one you are currently reading (which was made by volunteers!). All materials are subject to approval or editing by NICHES Land Trust outreach staff.

Develop science curriculum specific to grade and habitat - Put together age appropriate instructional resources that meet state standards of education. The curriculum / activities must be both hands-on and focused on connecting students with the natural world. Activities for our annual youth adventure camp (conducted out of Clegg Memorial Garden) can also be developed.

Citizen Science – Gather data about flora and fauna at a NICHES site. Being able to compare floristic or wildlife data on our properties allows us to better gauge and share the impact of our stewardship. If you have the appropriate training and are comfortable publicly presenting, we can work with you to turn a citizen science project into an engaging community outreach event (i.e. bird banding, monarch butterfly tagging, bio blitz's, etc.).radio, and contact local news outlets.

Invasive Species

What is an Invasive Species?

An "invasive species" is defined as a species that is: 1) non-native (or alien) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

Common Invasive Species

Common Invasive Species: Common invasive species for west central Indiana include Amur honey suckle, Japanese stilt grass, reed canarygrass, garlic mustard, winged burning bush, multiflora rose, autumn olive, tree of heaven, field parsnip, & poison hemlock. In order to rehabilitate a native ecosystem, a volunteer steward must master two key components: "Identification" and "Treatment". Identification revolves around using plant characteristics to distinguish your target species from other native species. Treatment involves killing or removing your target species with the most effective method possible. Some plants like garlic mustard can be easily pulled in the springtime, others like tree of heaven require chemical treatment to kill and stop the plant from resprouting.

Invasive Species Treatment

Treatment Notes

There are two main types of treatment for invasive plants: "chemical" and "non-chemical". Non-chemical treatments refer to either hand pulling the plant or cutting it down. For chemical treatment there are three main methods: "foliar spraying" "cut-stump" & "basal bark"

Cut Stump

Refers to applying herbicide to the cut stump of a plant. Many invasives can resprout after being cut, treating the stump will stop this process.

Foliar Spraying

Refers to coating the vegetative growth (leaves) of the plant with herbicide. This is one of the broadest forms of chemical treatment; by killing the foliar growth of the plant it will be unable to photosynthesize and will eventually die. Two things to keep in mind while foliar spraying is 1) try to cover as much foliage as possible, some particularly vigorous plants can survive off of a small amount of photosynthetic area 2) try to limit herbicide use to your target plant (reduce collateral damage) and refer to the instructions on the herbicide on where not to spray (i.e.. near water sources)

Basal Bark

Refers to applying herbicide in a ring on the outside trunk of an invasive. It's important to go completely around the plant and try to treat 6-8 inches above the ground. The ring will disrupt the transport of water and nutrients, which kills the plant. This method is commonly used in treating large invasives that are difficult to cut down (i.e. tree of heaven).

Mixing Herbicide

When you purchase herbicide, it will list a % of the active ingredient (a.i) in the product. For example, Glyphosate and Clopyralid are typically 41% a.i.* When calculating the % mixture of herbicide, water, carrier oil, or surfactant all percentages are based on the herbicide product, not on the % of the active ingredient (a.i.) in the product. For example, a 2% solution of glyphosate would be 2 oz of glyphosate (@41% a.i) mixed with 98 oz of water.
The typical math equation used for mixing herbicide is as follows: 128 oz in a gallon X how many gallons you want to mix X percentage desired of spray solution= oz of herbicide needed. So, let's say you want to mix a 2% foliar treatment for honeysuckle, and you have a 4 gallon backpack you'll be wearing. The math would be 128 oz X 4 gallons X 0.02 (2%)= 10.24 oz of glyphosate (41% a.i.) needed. This equation can be used to determine any herbicide mixing with any chemical at any concentration and any % a.i. Common herbicides include Glyphosate (Roundup), Triclopyr, Sethoxydim, Clethodim, and Imazapyr. When using herbicide it is first diluted with water and then usually mixed with a carrier oil (aids the weed killing function of the herbicide) or a non-ionic surfactant (surfactants reduce the surface tension of the water molecule enabling the water droplet to cover a greater leaf surface area). Also, inert marking dyes can be added to your herbicide mix to make it easier to tell what areas have been treated.

Amur Honeysuckle

Identification:

Leaves: The leaves of Amur Honeysuckle are opposite, elliptical to ovate, with long drawn-out tips. Leaves will emerge early in the spring (earlier than everything else), and they will remain on the plant until November. It is perhaps this early start and extended stay of honeysuckle foliage that allows it to vigorously outcompete other native species

Structure: honeysuckle does well both in full sun and shade. Adult plants have a tall arching structure which allow it to spread widely and shaDe out neighboring vegetation. The bark has vertical strips and the basal trunks and arching branches

Fruits and flowers: Honeysuckle produces an abundance of small round fruits that start out as dark green and change to red as the season progresses. The flowers emerge in pairs from the leaf axils in mid to late spring. They have a sweet fragrant smell anD start out as white and fade to a gold.

Treatment:

Non-chemical: Small plants can be hand-pulled. Once the plant is pulled, it is best to hang it in the hook of a tree, so it dries out and dies. *Chemical:* Foliar Spray: can be particularly effective in early spring when honeysuckle is the only plant that has leafed out and in later fall when it's the only one that still has leaves. Treat honeysuckle with a mix of 2-3% Glyphosate and ¼% non-ionic surfactant (product may already have surfactant included).
Cut Stump: This treatment is extremely effective but requires the plant to be cut ~3-5" from the ground with loppers or a brush cutter. Apply a mix of 50% Glyphosate and 50% water to the cut stump.
Basal Bark: This can be very effective but may be difficult on multi-stemmed individuals. Treat Basal Bark with mix of 20-30% Triclopyr & 70-80% horticultural or basal oil.

Autumn Olive

Identification:

Leaves: Autumn olive is a deciduous shrub with alternate elliptical leaves with a silver underside.

Fruits and berries: 5-10 tubular, silver or yellow flowers appear between Feb-June. During August-Nov red berries mature.

Branches/bark: The bark is olive drab with many white lenticels, and the branches contain many thorns.

Structure: Autumn olive can grow anywhere between 3-10 feet in height; it prefers more open habitats (edges of fields, old pastures, etc.). The silver sheen from the plants leaves help it to stand out.

Treatment:

Non-chemical: difficult for autumn olive due to its thorns

Chemical: Same Control Method as honeysuckle
Foliar Spray: Treat with a mix of 2-3% Glyphosate and ¼% non-ionic surfactant (product may already have surfactant included).
Cut Stump: This treatment is extremely effective but requires the plant to be cut ~3-5" from the ground with loppers or a brush cutter. Apply a mix of 50% Glyphosate and 50% water to the cut stump.
Basal Bark: This can be very effective but may be difficult on multi-stemmed individuals. Treat Basal Bark with mix of 20-30% Triclopyr & 70-80% horticultural or basal oil.

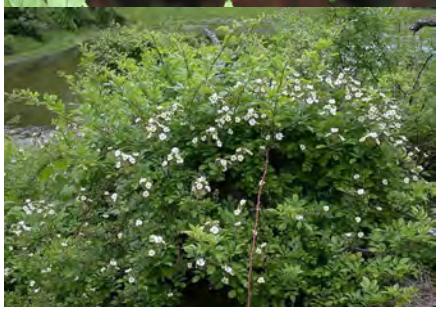
Multi-flora Rose

Identification:

Leaves: pinnately divided into 5-11 elliptical, sharply toothed leaflets, each up to one inch long.Fringed stipules (paired wing like structures) are present at the base of each leaf stalk(this is an important characteristicto distinguish multiflora rose from native rose species).

Structure: Thorny, multi-stemmed, perennial shrub or climbingvine with arching stems. Plants can grow as a thicket and/or climb into the lower branches of trees

Flowers/ Fruit: Flowers showy and fragrant in large clusters; white to pink, each about one inch across and stalked, petals notched. Fruits are also in clusters; small, bright red, smooth rose hips; form in summer and turn leathery and persist over the winter.



Treatment:

Non-chemical: difficult for M. Rosedue to its thorns

Chemical: Same Control Method as Honeysuckle & Autumn Olive
Foliar Spray: treatwitha mix of 2-3% Glyphosate and ¼%non-ionic surfactant (product may alreadyhave surfactant included).
Cut Stump: this treatment is extremelyeffective but requires the plant to be cut ~3-5" from the ground with loppers or a brush cutter. Apply a mix of 50% Glyphosate and 50% water to the cut stump.
Basal Bark: This can be very effective but may be difficult on multi-stemmed individuals. Treat Basal Bark with mix of 20-30% Triclopyr & 70-80% horticultural or basal oil.

Winged Burning Bush

Identification:

Leaves: simple and opposite or nearly so, 1 to 3 inches long, ¾ to 1½ inches wide, somewhat variable in shape but usually widest at or above the middle, tapering or wedge-shaped at the base, the tip pointed or tapering to a sharp point, often abruptly so. Surfaces are hairless, edges are finely serrated, the teeth rounded to pointed or even hooked. Stalks are very short and hairless. Leaves turn bright red in fall. *Branches:* new branchlets are weakly 4-sided, green and hairless, developing broad, reddish, corky wings along at least 2 of the angles. The wings eventually break off. Older branches have thin, gray-brown bark that splits, giving a striped appearance with the green inner tissue. Buds are cone-shaped with a sharply pointed tip.

Treatment:

Non-chemical: possible to hand pull young plants but older plants are difficult due to a strong root system. If the plant is cut and not chemically treated it will resprout vigorously.

Chemical: Same Control Method as honeysuckle, Autumn Olive, & Multiflora Rose

Queen Anne's Lace

Identification:

Leaves: Hairy underside, matte, fern-like, and smells like parsley. The stems have short white hairs (stems lack the purple spots that poison hemlock have).

Flower: Dense, lacey, flat-topped umbel (~5 in. diameter), usually with a purple flower in the center (as the story goes the red flowers in the middle of the lace is where Queen Anne pricked herself while making the lace).

Treatment:

Non-chemical: The best control method for Queen Anne's lace is simply hand pulling it before it goes to seed. Due to the plants large taproot it can be difficult to pull in dry or non-sandy soils. For best results try to plan your pulling directly after a rain when the ground is soft and always pull from the base of the plant. Try to pull before mid to late summer, if the plant is pulled after it has set seed (plant will turn brown and curl inward) you might just end up spreading seeds around and making the infestation worse.

Chemical: Herbicide treatment for Queen Anne's Lace is not recommended; they often grow in areas where significant collateral damage is hard to avoid.

Japanese Stilt Grass

Identification:

Structure: Japanese stilt grass is a prostrate to erect, sprawling and freely branched summer annual with spreading stems that root at the nodes. The stems are stiff and climb over other vegetation reaching more than 3 feet (~1 meter) in height but will remain prostrate if mowed. Dead plant parts persist through winter and well into spring and early summer.

Leaves: Key characteristics are a silvery midrib and an asymmetrical leaf shape. Leaves are rolled in the bud; ligules are short (~0.5 mm) membranous with hairs on the backside; auricles are absent. Young seedlings are easily distinguished from other summer annual grasses by the very broad, rounded first leaf.

Treatment:

Non-chemical: Japanese Stilt Grass has a weak root system and is easy to pull by hand

Chemical: For large patches a chemical treatment may be necessary. Foliar Spray: Treat with either a mix of 1% Glyphosate (or a grass specific herbicide like Sethoxydim or Clethodim) and ¼% non-ionic surfactant (product may already have surfactant included). Ensure that the plant gets full herbicide coverage, or it will continue growing (hand pulling is the most effective method).

Reed Canary Grass

Identification:

Leaves: are alternate, evenly spaced along the stem, ascending to spreading, mostly flat, hairless but rough-textured on surfaces and along the edges, 4 to 12 inches long, ¼ to about ¾ inch (5 to 20mm) wide. Dead leaves turn a bleached tan color and persist through winter.

Stem: Sheaths are hairless with thin, translucent edging, and the edges overlapping at or near the tip. The ligule (membrane where the leaf joins the sheath) is 4 to 10 mm long, very thin, often folded over and lacks a fringe of hairs. The collar (outer junction between the blade and sheath) is prominent and yellowish. Nodes are smooth. Stems are smooth, unbranched, and form large, dense colonies from long, scaly rhizomes. The entire upper vegetative portion of this species fades to a pale, bleached tan that is diagnostic in the dormant season identification.

Seedheads: normally extend well above the leaves of the plants and are a golden tan at maturity. As the seedheads first mature, the remaining foliage is usually still green, resulting in a striking clump of green with golden tops.

Treatment:

Non-chemical: Mowing may be a valuable control method, since it removes seed heads before seed maturation and exposes the ground to light, which promotes the growth of native species. Studies in Wisconsin indicated that twice-yearly mowings (in early to mid-June and early October) led to increased numbers of native species in comparison to reed canary grass-infested plots that were not mowed.

Chemical: For large patches, a chemical treatment may be necessary. Foliar Spray: Either treat in May / June before it flowers with 1% Imazapyr product , 1/2% Glyphosate product and 1/4% non-ionic surfactant or treat from mid-September to consistent frosts with 3% Glyphosate product approved for aquatic areas and 1/2% surfactant.

Poison Hemlock

Identification:

Leaves: are 1 to 16” long, alternate (1 leaf per node), compound, finely dissected, and fern-like in appearance. Leaflets are small, lance shaped, glossy green, darker on the upper side, and have serrated edges. In its first year of growth, it develops a basal rossete and will remain close to the ground.

Flowers: are small (1/2 to 1/6” across) and have 5 white petals. They form in terminal, umbrella-shaped clusters that are between 1 to 3” in diameter

Stems: are rigid, branched, hollow except at the nodes, grooved and hairless. Stems are light green with distinctive purplish blotches.

Treatment:

Non-chemical: Hand pulling must be done carefully do toxic properties of the plant (remove as much of the root as possible. Mowing is an option, but it must be done regularly because the taproot can send up resprouts.

Chemical:
Foliar Spray: can be treated with a 2% mix of glyphosate or Triclopyr (broadleaf-specific herbicide that will not harm grasses).

Field (Wild) Parsnip

Identification:

Leaves: are alternate (1 leaf per node) and compound with 5-11 leaflets. Leaflets are yellowish-green, shiny, oblong, coarsely toothed, and either mitten or diamond shaped.

Flowers: are small and have 5 yellow petals. They form in terminal, umbrella-shaped clusters that are between 4-8" in diameter.

Stems: The stem is compressed during the rosette stage of growth and elongates during the second year to form an upright flowering stalk that is 2-5 feet tall, branched, hollow (except at the nodes), grooved, and somewhat hairy.

Treatment:

Non-chemical: A very effective control method is to cut the entire root just below ground level with a sharp shovel or spade. Cutting below ground level prevents resprouting. In some soil types in wet conditions, the plants can be pulled out of the ground by hand. All seeds must be removed from the site and disposed of in a landfill or by burning.

Chemical:
Foliar Spray: wild parsnip can be effectively treated with a 1-3% mix of glyphosate or 2,4-d. If a site is burned parsnip will be one of the first plants to resprout, which makes it easy to spot, access, and treat without damaging other plants.

Tree-of-Heaven

Identification:

Leaves: Tree-of-heaven leaves are pinnately compound, meaning they have a central stem in which leaflets are attached on each side. One leaf can range in length from 1 to 4 feet with anywhere from 10 to 40 leaflets. The leaflets are "lance" shaped with smooth or "entire" margins. At the base of each leaflet are one to two protruding bumps called glandular teeth. When crushed, the leaves and all plant parts give off a strong, offensive odor (some say rotten peanut butter).

Bark: The bark of tree-of-heaven is smooth and green when young, eventually turning light brown to gray, resembling the skin of a cantaloupe.

Twigs: The twigs of tree-of-heaven are alternate on the tree, stout, greenish to brown in color, and lack a terminal bud. They have large V- or heart-shaped leaf scars. The twigs easily break to expose the large, spongy, brown center, or pith.

Seeds: On female trees are a 1-to-2-inch-long twisted samara, or wing. There is one seed per samara. The samaras are found in clusters, which often hang on the tree through winter.

Treatment:

Non-chemical: Tree-of-heaven will vigorously resprout when cut, chemical treatment is necessary.

Chemical:
Foliar Spray: 3% mix of glyphosate ¼% surfactant on saplings only
Basal Bark: Basal bark treatment with 20-30% Tricolpyr product and 70-80% horticultural oil or basal oil.

Garlic Mustard

Identification:

Leaves: Young plants form rosettes of dark green, kidney-shaped leaves that have scalloped edges and long hairy stalks (petioles). Stem leaves on adult plants are alternate (1 per node), coarsely toothed, and triangular to heart shaped. Stem leaves are largest (2-4 inches wide and long) on the lower portion of the stem and become smaller toward the top of the stem.

Flowers: are borne in clusters at the tops of the stems. Each flower consists of 4 white petals that are about ¼" long and form the shape of a cross.

Fruit and seeds: The fruit is a long, narrow pod (1-2" long). Each pod contains an average of 16 small, black, oblong seeds.

Treatment:

Non-chemical: The most effective treatment for garlic mustard is hand pulling. When pulling the plant be sure to grab it near its base so you ensure that the entire root system is removed. If the plant is pulled early in the spring, it can be hung in the crook of a nearby tree. If the plant is pulled after it has gone to seed (seed heads discolor to black), it needs to be bagged and either burned or thrown away.

Chemical:
Foliar Spray: large patches can be effectively treated with a 3% mix of glyphosate. In general hand pulling is the most effective method.

Connect With Us!

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@niches_land_trust

On behalf of the NICHES Land Trust community, we want to thank you for taking the time to learn more about what you can do to help preserve, protect, and share our local natural heritage! Please consider volunteering or donating to keep our local ecosystems flourishing. Visit our website for more information about our organization, our properties, or how you can enroll your own land to be protected in perpetuity!

NICHES Land Trust

Address:	1782 N 400 E, Lafayette, IN 47905
Phone:	(765) 423 - 1605
Email:	niches@nicheslandtrust.org

"Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it is the only thing that ever has."
– Margaret Mead

If you would like to volunteer your time to help further the preservation and rehabilitation of our local northern Indiana ecosystems, please contact our Volunteer and Outreach Coordinator sam@nicheslandtrust.org for more information.