

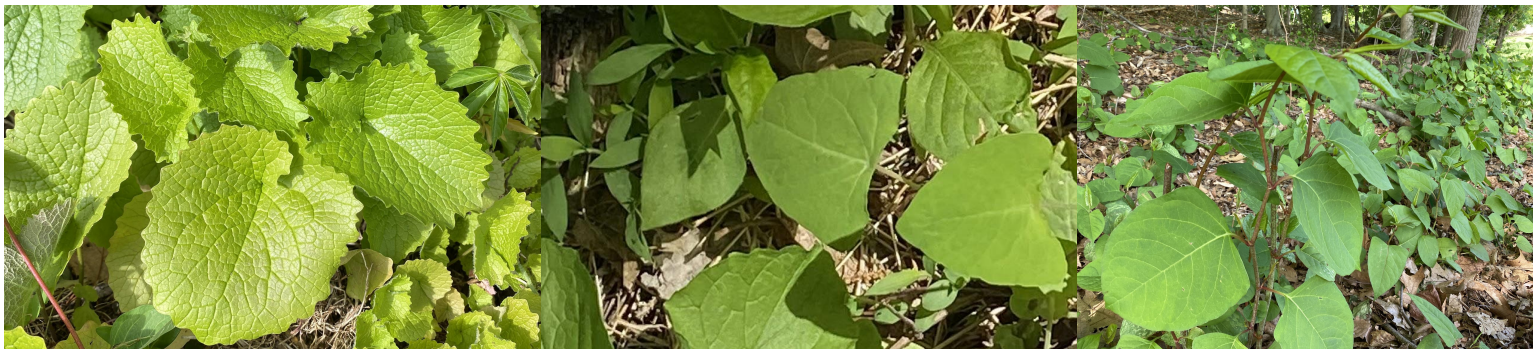
A Guide to
Identify and Remove
Westport's Top Ten Invasive Plants



What are invasive plants?

Invasives are non-native plants, that aren't naturally found in an ecosystem. They must also possess traits that give them a reproductive advantage over native plants, plus the ability to spread into areas beyond where they are planted. These traits include: a high seed output, early seasonal emergence, rapid spread, the ability to live in a wide range of environments, and aggressive roots.

Any plant introduced in North America after 1492 is non-native. Not all non-natives are invasive, and a plant may be classed as invasive in one state but not another. In Connecticut, invasives are established by state law according to 9 criteria including economic and environmental harm.





Why are invasive plants a problem?



In every ecosystem, there's a food web that regulates the populations that live there based on resources available. If there's no grass, then the mice can't eat, then the foxes can't eat and so on. Slowly but surely, the biodiversity of that ecosystem will be lost as the native species die off.

Since invasive plants did not evolve within our ecosystem, few creatures have adapted to eat them. As the invasives outcompete native plants due to their aggressive nature, there are fewer food resources available for native animals. It can take millennia for animals to adapt to using the invasive species as a resource. Thus, non-native plants support far fewer species than native plants, which causes habitat loss and animal population decrease.

When homeowners allow invasives to flourish in their yards, in short order these invasives find their way to nature preserves and open spaces. Sadly, even many of our preserves are becoming 'food deserts' for our native insects and animals.

Protecting the environment from invasives begins in our own yards.

Organic Removal Methods:



- ❖ **Hand Pulling:** Hand pulling or digging is applicable for small infestations of annual and biennial weeds and young woody saplings with a shallow root system. Some specialty tools (such as Root Jack/The Uprooter/Weed Wrench) are designed to remove small woody plants with a lever action by pinching/clamping the plant at its base and uprooting it.
- ❖ **Cutting:** Some tall herbaceous weeds and woody plants can be controlled by cutting the above-ground growth before the plants flower. Tools like pruners and loppers are useful. In most cases, repeated cutting/mowing will gradually weaken the plant, leading to less growth.



Organic Removal Methods (continued) :

- ❖ **Girdling:** The process of cutting away/scoring the bark around the circumference of undesirable woody plants to weaken or kill the plant. Can cause some invasive trees to resprout from the base, so follow-up monitoring is necessary for control.
- ❖ **Burning:** Smaller infestations can be burned using a propane torch/weed-burning device. Follow precautions, instructions and any local regulations.
<https://garden.org/learn/articles/view/77/>



Chemical Removal Method :



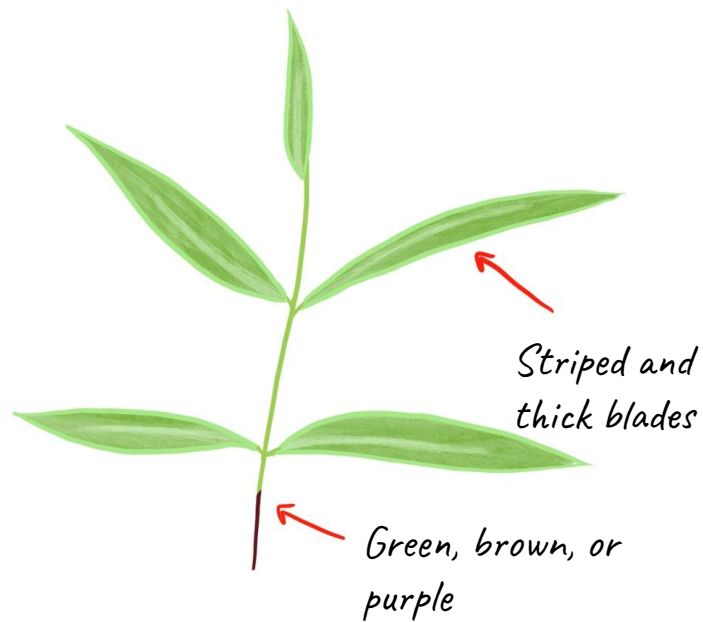
- ❖ In extreme cases, such as invasives which can regrow from only a small remaining segment of root, an herbicide may be applied with great caution to the newly cut surface of the invasive. When using any herbicide, always read the label first.
- ❖ **Cut Stump Method:** An herbicide such as glyphosate can be painted onto the cut stumps and branches of trees, shrubs, or woody vines. Allows treatment of individual plants without harming desired species around the invasive. Effective at low temperatures as long as the ground is not frozen. <https://www.extension.iastate.edu/news/2009/jun/112401.htm>

Grasses



Japanese stiltgrass (*Microstegium vimineum*)

Carpets areas of open woodlands, choking out natives



- ❖ **Summer annual**
- ❖ **Size:** 1-3 feet in height
- ❖ **Leaves:** Alternate, pale green, and lance-shaped; 1-3 inches in length; have a silvery stripe of hairs along the midrib of the upper leaf surface; thicker and broader than most other grasses
- ❖ **Flowers:** August-October; slender flower spikes that appear in pairs
- ❖ **Stem:** Thin and wiry; green, purple, or brown
- ❖ **Fruit:** Appear after blooming (August-October); are dry and yellow to red in color
- ❖ **Removal:** Hand-pull or mow. Best done in the late summer when the plant is tall and easy to grab but before it has set seed. The plant is an annual, so preventing it from seeding is the best control. Follow up monitoring and treatment will be necessary for years.

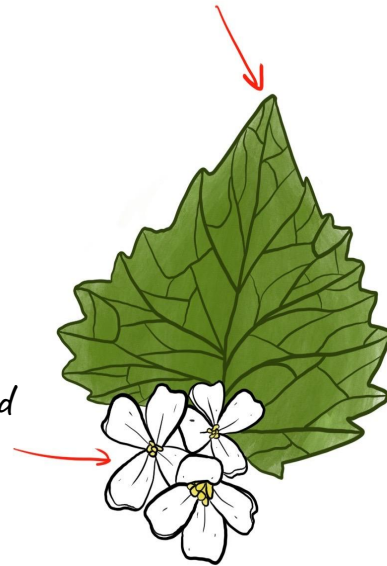
Herbaceous Plants



Year 1: Scalloped leaf (1-5 cm in diameter), short stem, no flowers

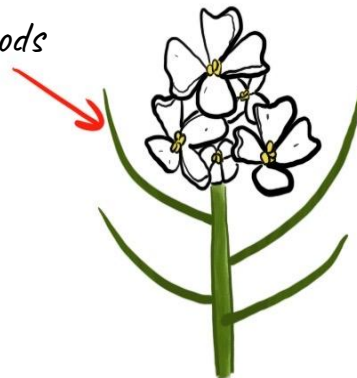


Year 2: Pointed leaf



*White
four-petaled
flower*

Seed pods



Garlic mustard (*Alliaria petiolata*)

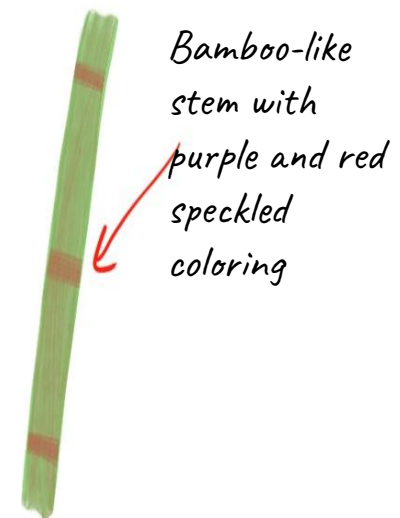
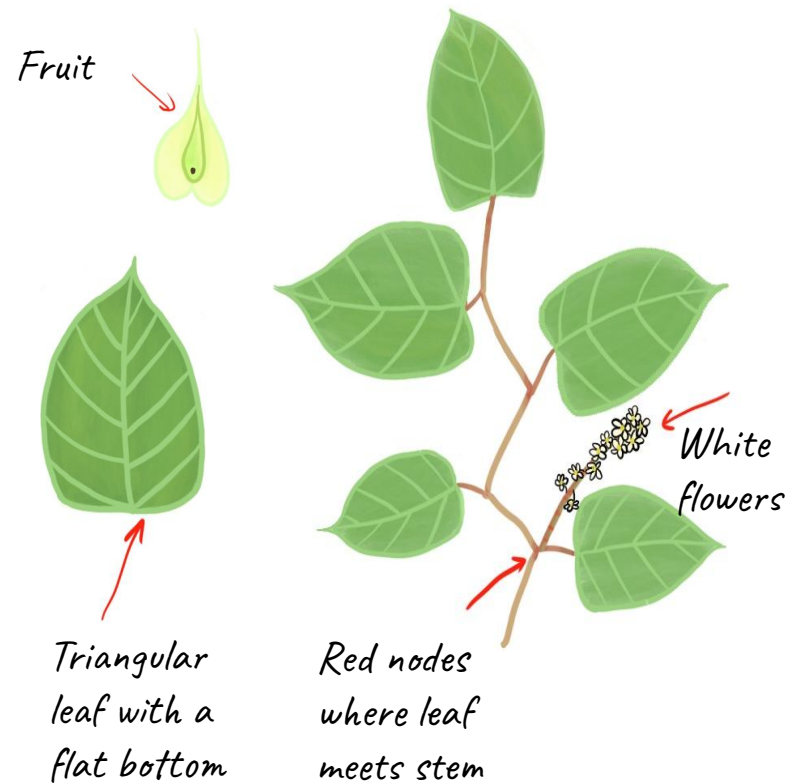
In recent years, garlic mustard has begun to dominate shady wooded areas

- ❖ **Biennial**
- ❖ **Size:** 2-6 feet tall when fully grown
- ❖ **Leaves:** Round and scalloped edges in the first year. Heart shaped leaves form in the second year.
- ❖ **Flowers:** White, form in second year when the stem fully grows.
- ❖ **Stem:** A long stem (1-2 feet) appears in March and April of the second year - "S" shaped curve at the base, seed pods at the top. A small stem is present in the first year with only the leaf.
- ❖ **Removal:** For best results, remove in spring before the plant can set seed, which is how it spreads. If seed pods are visible, do not compost - dispose in garbage bags for collection and incineration.

Japanese knotweed (*Polygonum cuspidatum*) or *Fallopia japonica*

Japanese knotweed can engulf and smother large areas of open woodland

- ❖ **Herbaceous shrub that likes wet, sunny areas**
- ❖ **Perennial**
- ❖ **Size:** Knotweed can reach heights of 10 feet. It also has rhizomes, subterranean horizontal roots that produce more shoots, that allow the plant to reach lengths of 65 feet.
- ❖ **Leaves:** Up to 6 inches long and 5 inches wide. Leaves have rounded sides, a flattish bottom, and a pointed tip.
- ❖ **Flowers:** Small, off-white flower clusters appear at the nodes in August to September.
- ❖ **Stem:** Bamboo-like stem that is green with purple/red coloring. The nodes are also red.
- ❖ **Fruit:** Three-winged, <10 mm long, and have dark seeds that birds spread.
- ❖ **Removal:** Repeated cutting back of the shoots before they have time to grow new leaves eventually weakens the plant. Continue to monitor the sites where the plant is found since rhizomes continue to produce more shoots.

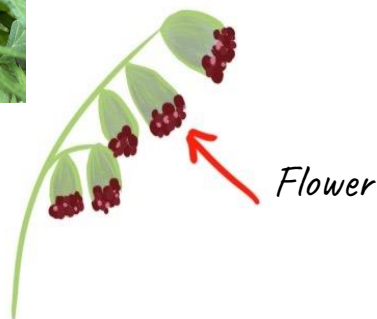


Developed stem with ridges



Front:
Green and smooth

Back:
Silver and hairy



Mugwort (*Artemisia vulgaris*) or **common wormwood**

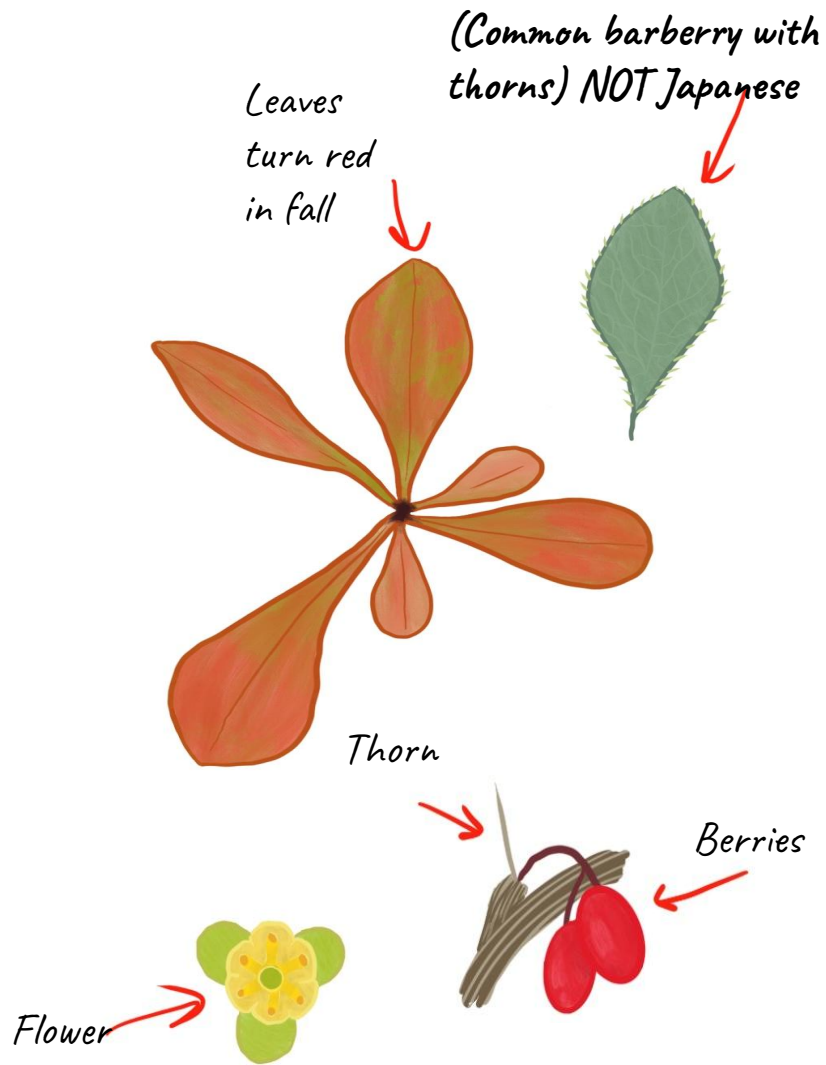
Once established, mugwort can dominate entire roadsides

Perennial

- ❖ **Size:** Around 3-6 feet tall
- ❖ **Leaves:** One silver, hairy side and one dark side. The leaves smell strongly like sage.
- ❖ **Flowers:** Clustered; 3 mm diameter; maroon/yellow coloring
- ❖ **Stem:** Vertical grooves that eventually harden; green or purple coloring. Around 20 stems can form from one root system.
- ❖ **Fruit:** Brown, contains one seed, and is bulb-shaped
- ❖ **Removal:** Mugwort spreads by rhizomes so any root remaining will create a new plant; pulling may encourage it to spread. Instead, smother with a layer of newspapers/cardboard topped by a very thick mulch layer. For large infestations see <https://extension.umd.edu/hgic/topics/mugwort>

Shrubs





Japanese barberry (*Berberis thunbergii*) & Common barberry (*Berberis vulgaris*)

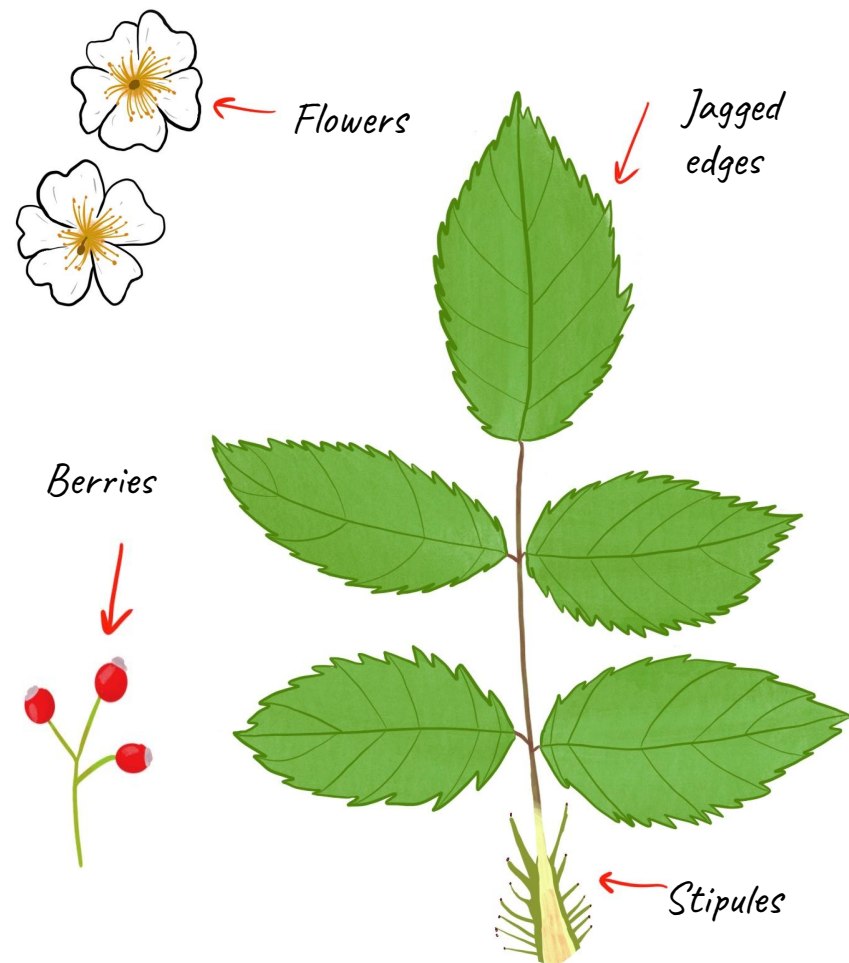
Barberries harbor concentrations of ticks

- ❖ **Perennial**
- ❖ **Size:** On average, it will grow 3-6 feet tall but can reach 10 feet. It can also spread around 4-7 feet.
- ❖ **Leaves:** Thin base, wide tip, smooth and found in clusters. Leaves also turn red in the fall. Common barberry looks similar but can be distinguished by three-pronged spines on stems.
- ❖ **Flowers:** Yellowish; clusters of 2-4 from nodes; bloom April-May; pollinated by insects
- ❖ **Stem:** Prominently grooved and have spikes at nodes. Younger shoots are more red while developed ones are brown/gray. The interior is yellow.
- ❖ **Fruit:** A little less than half an inch long; oblong, bright red, and last from summer through winter. Animals will eat them and disperse the seeds.
- ❖ **Removal:** Be sure to remove before berries appear. Clear the base and pull the plant out making sure all of the roots came out. Wear protective clothing - this plant has thorns and attracts ticks. Discard all scraps immediately.

Multiflora rose (*Rosa multiflora*)

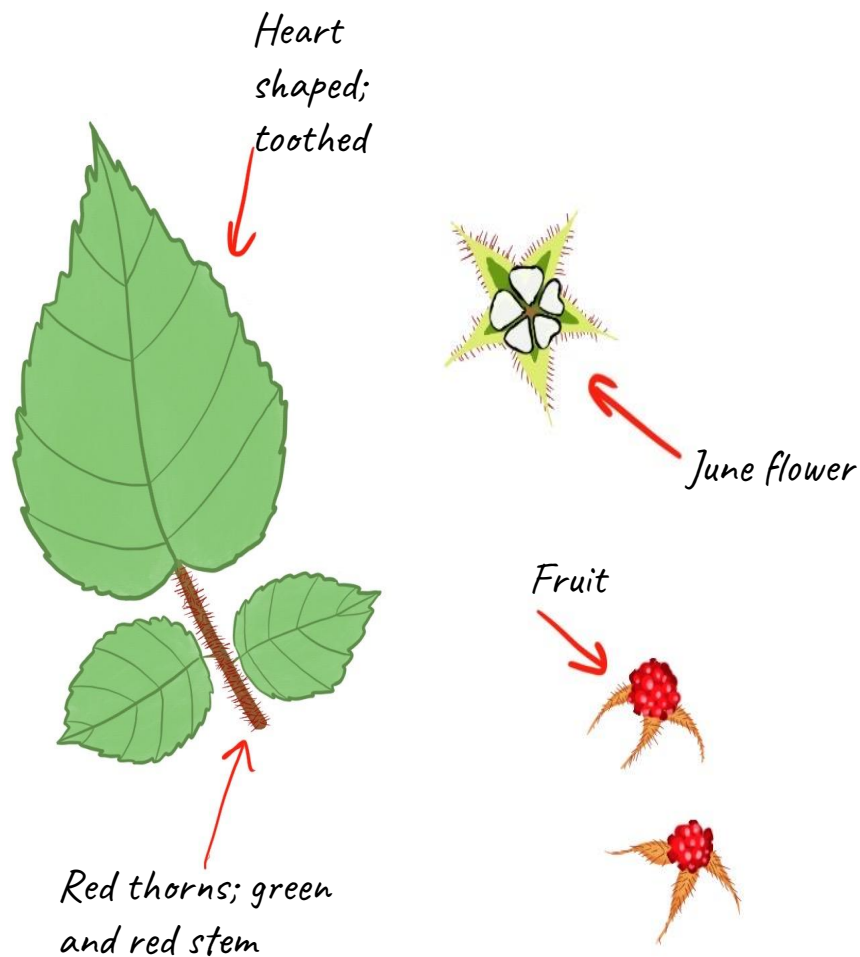
Aggressive plant can overcome native species, forms dense hedge

- ❖ **Perennial**
- ❖ **Size:** Can reach 15 feet and forms dense thickets
- ❖ **Leaves:** Alternate, pinnately compound. Leaf: 5 to 11 1-inch oval leaflets with toothed margins. Leaflet: underside paler than the upper surface, has tiny hairs
- ❖ **Flowers:** May-June; small, white or slightly pink, 5 petals, and grows in clusters
- ❖ **Stem:** Long, flexible, and green or red in color; has many sharp backward-curved thorns in pairs
- ❖ **Fruit:** August-winter; small, hard, red, and round; they become leathery and remain on the plant all winter
- ❖ **Removal:** Dig up/uproot; plant spreads via seeds in rose hips so removal by June is best. Where large infestations of multiflora exist, see <https://ipm.missouri.edu/IPCM/2015/2/Weed-of-the-Month-Multiflora-rose/>



Red nodes





Wineberry (*Rubus phoenicolasius*)

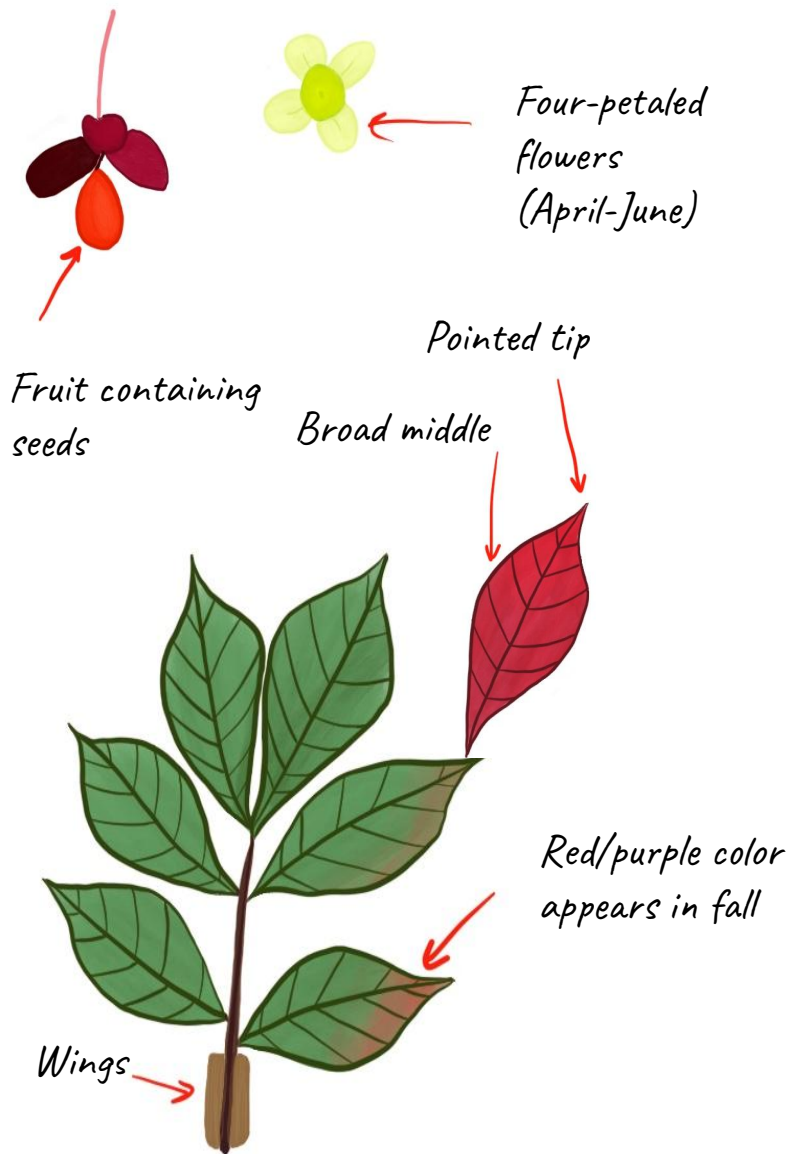
Rampant grower can engulf other vegetation

- ❖ **Perennial**
- ❖ **Size:** Grows in long shoots up to 6 feet long
- ❖ **Leaves:** Compound. Leaf: alternate along the stem. Leaflet: 3 per leaf, leaflet at the end is largest, is heart-shaped and toothed, green on top, white/silvery on the bottom
- ❖ **Flowers:** June; white, 5 petals
- ❖ **Stem:** Multi-stemmed; green early in the season, but eventually become red; covered in small, reddish hairs and sharp spines; shoots can re-root at the tips when they touch the ground
- ❖ **Fruit:** July-August; red, raspberry-like
- ❖ **Removal:** Hand-pull with thick gloves or using a four-prong spading fork, especially when the soil is moist. All roots and branches must be removed to prevent re-sprouting. It is recommended to immediately replant the exposed area with a desirable native, to prevent another invasive from moving in.
- ❖ http://nyis.info/invasive_species/wineberry/

Winged euonymus (*Euonymus alatus*) or Burning bush

Displaces native species; doesn't support North American ecosystems

- ❖ **Perennial**
- ❖ **Size:** On average, its height ranges from 5-10 feet but it can reach 20 feet.
- ❖ **Leaves:** Around 2 inches long and turn red/purple in the fall and alternate placement around stem
- ❖ **Flowers:** Greenish flowers that are less than half an inch long appear in April-June and turn red in the fall.
- ❖ **Stem:** Corky stems with 2-4 wings that eventually fall off.
- ❖ **Fruit:** The berries mature from green to orange capsules during September-October along with the flowers. The fruit contains the seed.
- ❖ **Removal:** To remove fully, dig out the roots to easily remove the plant. Once it's dried out, it can be composted if there are no flowers. If flowers are present, it should be bagged flower-first to prevent re-seeding. This shrub can also be cut and ground down as long as the re-growth is also constantly cut.



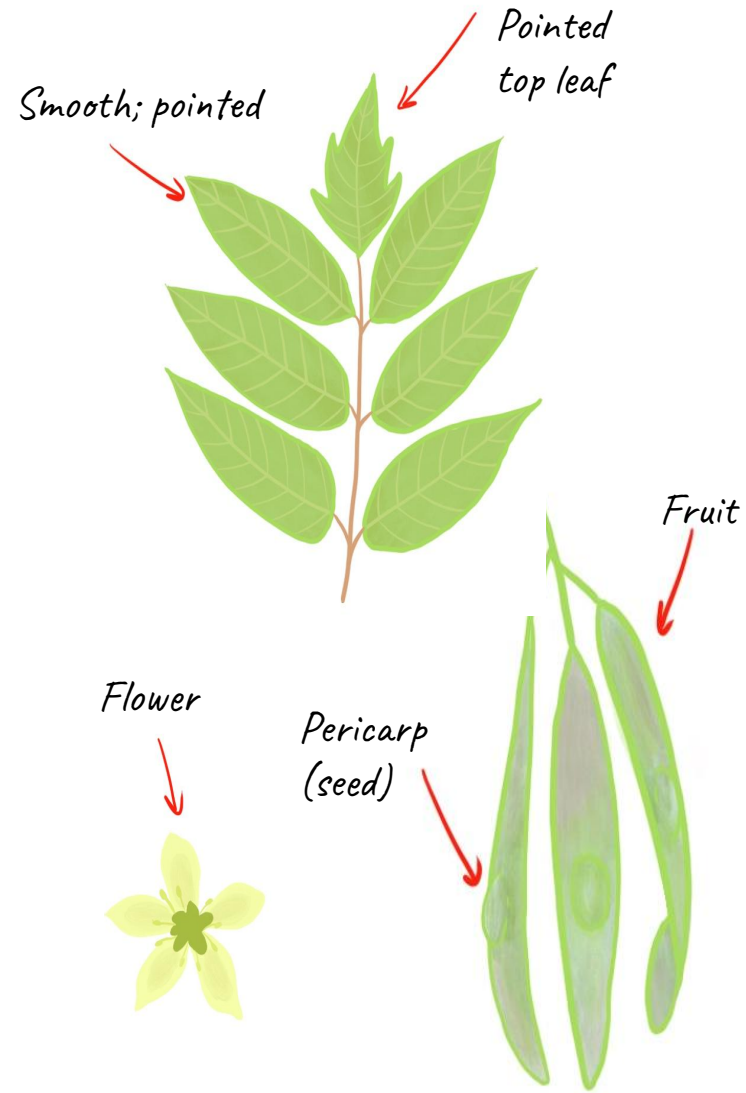
Trees



Tree of Heaven (*Ailanthus altissima*)

Host plant for the spotted lanternfly (a damaging invasive species which threatens Northeast farms)

- ❖ **Perennial;** lasts 25 to 30 years
- ❖ **Size:** Can grow very large (80-100 feet)
- ❖ **Leaves:** Pinnately compound. Leaves: 1-4 feet long, 10-40 leaflets, and grow alternately. Leaflets: lance-shaped and grow oppositely. They give off an unpleasant odor when crushed
- ❖ **Flowers:** June-August; small, yellowish-green, grow in large clusters
- ❖ **Stem:** Smooth and green when young, eventually turning light brown to gray, resembling the skin of a cantaloupe. The pith looks like peanut butter and smells bad
- ❖ **Fruit:** July-winter; they are flat, twisted, single-seeded winged fruits (i.e. samaras) that grow in large clusters
- ❖ **Removal:** Young seedlings can be pulled out by hand; saplings may require a removal tool. Established trees may require more aggressive and repeated treatment. See http://www.dof.virginia.gov/infopubs/Control-and-Utilization-of-Tree-of-Heaven-2019-03_pub.pdf



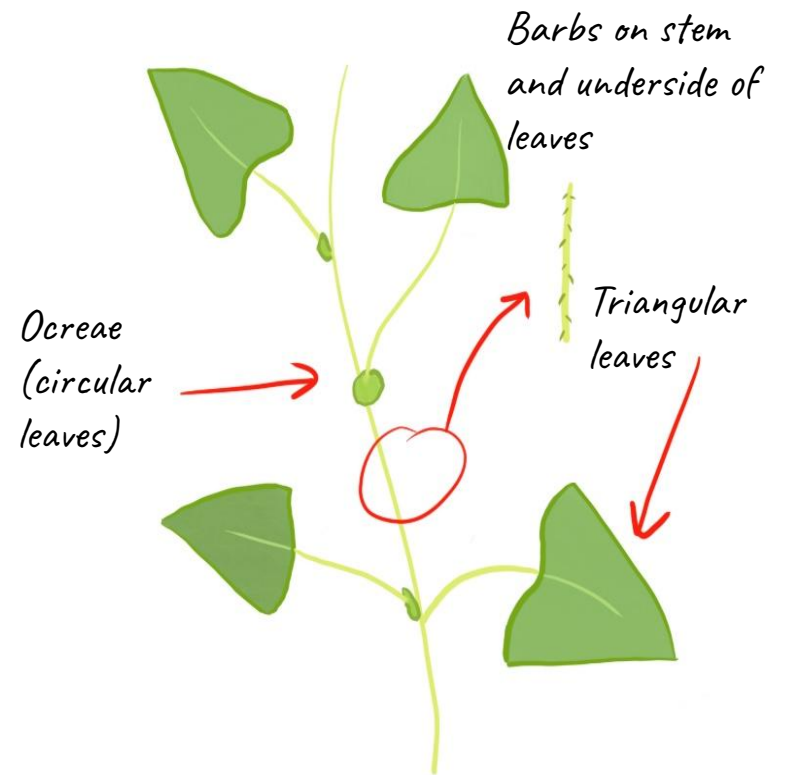
Vines



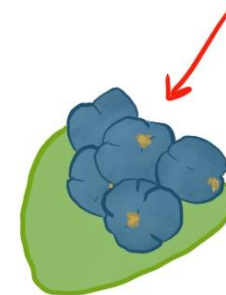
Mile-a-minute vine (*Polygonum perfoliatum*) or *Persicaria perfoliata*

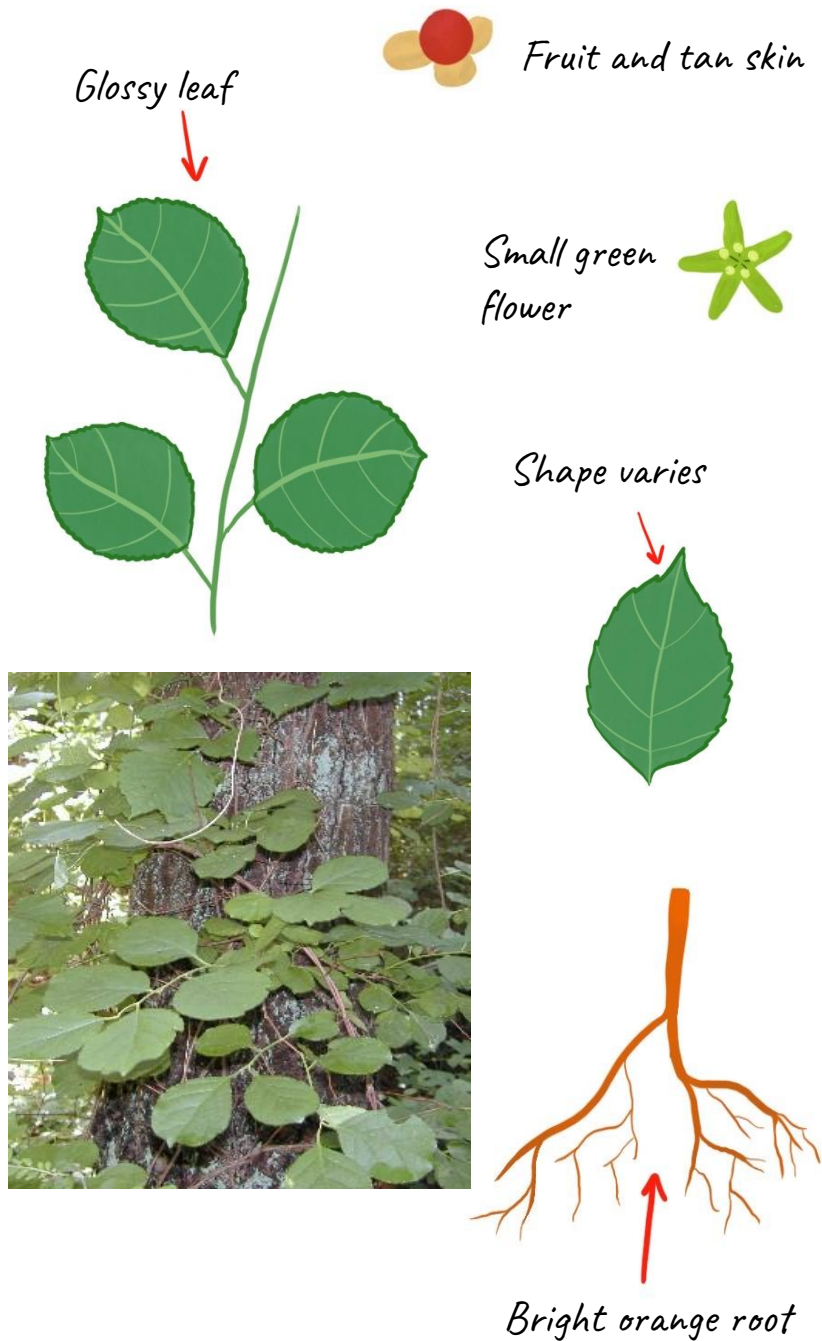
Capable of growing 1 foot per day; engulfs and smothers other vegetation

- ❖ **Summer annual**
- ❖ **Size:** Can reach heights of over 25 feet
- ❖ **Leaves:** Simple, alternate, light green, and are nearly equilateral triangles; 1.5-3 inches long and 2 -3.5 inches wide
- ❖ **Flowers:** June-October; small, white, and grow in clusters on the saucer-shaped leaves (ocreae) that grow on the nodes of the stem
- ❖ **Stem:** Narrow, green to red-tinted; has small, curved barbs; each node has saucer-shaped leaves encircling the stem
- ❖ **Fruit:** July-October; blue, berry-like, form a spike as they grow from the ocreae
- ❖ **Removal:** Hand-pull with protective gloves, bag, and dispose of by incineration. The plant is an annual so removal before it sets seed is effective for control. See <https://extension.psu.edu/mile-a-minute>



Blue berries contain seeds





Oriental bittersweet (*Celastrus orbiculatus*) or Asiatic bittersweet

Climbs and eventually strangles trees

- ❖ **Perennial**
- ❖ **Size:** Up to almost 100 feet and 7 inches in diameter. This vine climbs by coiling itself around a tree/shrub/etc
- ❖ **Leaves:** Alternating; toothed; varies in shape but rounded with a fine tip; 2-5 inches in length.
- ❖ **Flowers:** Greenish flowers bloom in May and June and are found in clusters.
- ❖ **Stem:** Woody with horizontal striations. Oriental bittersweet is also known for its orange roots.
- ❖ **Fruit:** Small, red fruit with a tan/yellow skin. Each fruit has between 3-6 seeds in it which are spread by animal consumption and defecation.
- ❖ **Removal:** Smaller plants can be easily pulled. Try to pull the long rhizomes which cause the plant to spread. Cut vines at base climbing up trees; no need to remove the entire vine. Plant may be composted if it's been pulled up before seed is present. Otherwise bag and dispose. See https://www.srs.fs.usda.gov/newsroom/newsrelease/2004/nr_2004-06-24-bittersweet.htm

Additional Resources/Information:

❖ **Japanese stiltgrass:**

http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_010258.pdf <https://njaes.rutgers.edu/fs1237/>

❖ **Garlic mustard:** This plant is edible and has a strong garlic smell.

❖ **Japanese knotweed:** <https://foragerchef.com/knotweed-fruit-leather/>

❖ **Mugwort:** <https://www.rxlist.com/mugwort/supplements.htm>

❖ **Japanese barberry:** UConn research has found a strong correlation between the presence of barberry and increased concentration of ticks

❖ **Multiflora rose:**

<http://www.nifatrees.org/Resources/Documents/Invasives/multiflora-rose.pdf>

<https://www.kingcounty.gov/services/environment/animals-and-plants/noxious-weeds/weed-identification/multiflora-rose.aspx>

Additional Resources/Information (continued):

- ❖ **Wineberry:**
http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_010303.pdf
- ❖ **Winged euonymus/Burning bush:** Seeds from this plant are spread by animal consumption. However, deer won't eat it leading to a decrease of native food sources.
- ❖ **Tree of Heaven/ailanthus:** Sometimes confused with sumac, a native
<https://extension.psu.edu/tree-of-heaven>
- ❖ **Mile-a-minute vine:**
<https://www.extension.purdue.edu/extmedia/fnr/fnr-481-w.pdf>
Biological method: the weevil, *Rhinoncomimus latipes*, feeds on mile-a-minute vine and has been approved by USDA-APHIS for reducing mile-a-minute infestations and seed production. See
https://www.threelakescouncil.org/wp-content/uploads/2016/06/MAM_weevil.pdf for more information

Glossary:

- ❖ **Alternate leaf growth:** There is one leaf per plant node, and they alternate sides.
- ❖ **Annual plant:** A plant that performs its entire life cycle from seed to flower to seed within a single growing season. All roots, stems and leaves of the plant die each year.
- ❖ **Biennial plant:** A plant which requires two years to complete its life cycle. First season growth results in a small cluster of leaves near the soil surface. During the second season's growth stem elongation, flowering and seed formation occur followed by the entire plant's death.
- ❖ **Compound leaf:** A leaf of a plant consisting of several or many distinct parts (leaflets) joined to a single stem.
- ❖ **Deciduous plant:** A plant that loses its leaves annually.
- ❖ **Herbaceous plant:** A plant that has green and soft stems, as opposed to a woody stem.
- ❖ **Midrib:** The large vein along the midline of a leaf.
- ❖ **Ocrea:** A saucer-shaped leaf that encircles the stem of mile-a-minute.
- ❖ **Opposite leaf growth:** There are two leaves per plant node, and they grow opposite to each other.
- ❖ **Perennial plant:** A plant that persists for many growing seasons. Generally, the top portion of the plant dies back each winter and regrows the following spring from the same root system. Many keep their leaves year round.

Glossary (continued):

- ❖ **Pinnately compound leaf:** A type of compound leaf where the leaflets are arranged on each side of the leaf's central stalk (axis).
- ❖ **Pith:** The spongy cellular tissue in the stems and branches of many plants.
- ❖ **Rhizome:** Modified subterranean plant stem that sends out roots and shoots from its nodes
- ❖ **Samara:** A winged fruit that certain plants (such as tree of heaven) produce.
- ❖ **Simple leaves:** A leaf that is made up of a single leaf blade and isn't divided up into several leaflets (e.g. a maple leaf)

This handbook has been created by Staples High School interns
Tallula Goldberg and Ben Spector

With special thanks to...

