

The background of the entire page is a dense, repeating pattern of stylized illustrations of various invasive plants. These include thick, gnarled vines, large heart-shaped leaves, and clusters of small berries. The illustrations are rendered in two shades of brown/orange against a solid orange background.

# INVASIVE PLANTS OF PITTSBURGH

## About the Pittsburgh Parks Conservancy:

The Pittsburgh Parks Conservancy is a national leader in park planning, management, maintenance, and restoration. As the fundraiser and non-profit advocate for Pittsburgh's parks, The Pittsburgh Parks Conservancy has raised more than \$65 million for parks improvements.

The Parks Conservancy's work includes the restoration of historic buildings, public artworks, cultural landscapes, and natural areas; operations management and programming of Schenley Plaza, Schenley Park Café and Visitor Center and Mellon Square Park; and the education of students and involvement of citizen volunteers in hands-on ecological restoration.

Because of the efforts of volunteers in Pittsburgh, our parks are healthy, beautiful and safe places for exercise and recreation. Our volunteers deserve our thanks. We hope this handbook contributes to continued successful efforts.

This publication is supported by a grant from  
**Laurel Foundation.**



## Urban EcoSteward Partner Organizations

### **Allegheny CleanWays**

[alleghenycleanways.org](http://alleghenycleanways.org)

### **Allegheny Land Trust**

[alleghenylandtrust.org](http://alleghenylandtrust.org)

### **Frick Environmental Center**

[pittsburghparks.org/environmentalcenter](http://pittsburghparks.org/environmentalcenter)

### **Mount Washington Community Development Corporation**

[mwcdc.org](http://mwcdc.org)

### **Nine Mile Run Watershed Association**

[ninemilerun.org](http://ninemilerun.org)

### **Pittsburgh Parks Conservancy**

[pittsburghparks.org](http://pittsburghparks.org)

## Urban EcoSteward Information

Name: .....

Site Name: .....

Site Number: .....

## Urban EcoSteward Field Coordinator Information

Name: .....

Organization: .....

Phone Number: .....

E-mail: .....

**Please log your hours at  
[www.pittsburghparks.org/ueshours](http://www.pittsburghparks.org/ueshours)**

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## Urban EcoStewards

The Urban EcoSteward program grew out of a belief that volunteers play an important role in the protection of our urban green spaces.

Urban EcoStewards take on the long term stewardship of a section of green space and work throughout the year to improve ecosystem health and function by monitoring and removing invasive plants, planting native species, cleaning up dumpsites, controlling erosion and spreading the word about the value of these activities.

## Invasive Plants of Pittsburgh Guide

This guide is designed to give volunteers the information necessary to identify and control the invasive plants that pose the greatest threat to biodiversity in the Pittsburgh area. It is not intended as a complete list of non-native plants and should be used in conjunction with a guide to native species.

For a more detailed list of invasive plants in Pennsylvania, view the Invasive Plant Management Tutorial on the Pennsylvania Department of Conservation of Natural Resources website: [www.dcnr.state.pa.us/forestry/plants/invasiveplants/invasiveplanttutorial/index.htm](http://www.dcnr.state.pa.us/forestry/plants/invasiveplants/invasiveplanttutorial/index.htm).

If you are in doubt about the identity of a plant, contact your Urban EcoSteward Field Coordinator before attempting to manage or remove the plant.

## How to use this guide

The species in this guide are organized by plant type (herb, shrub, vine and tree) and alphabetically by common name. Each species has information about characteristics used to identify the plant, as well as how and when to manage it on your site. If you are unfamiliar with a term, refer to the glossary at the back of the book.

## Key

Beside the heading and page number for various plants, you might see one of the following symbols:



This plant may be a new invader, or there are special concerns related to its management. Urban EcoStewards should contact their Field Coordinator before proceeding with management



This plant may have a native species look-alike, so Urban EcoStewards should be careful to positively identify the plant before removing it.



**If unmanaged, aggressive invasive vines can take over and completely block sunlight to trees and understory plants.**

## What is an invasive plant?

Every species has a native environment where it lives in balance with its predators and competitors. If a plant is growing outside of its native environment without any controls to limit its growth and reproduction, it may become invasive and dominate a landscape by outcompeting native species. Some native plants, including vines, can become invasive in disturbed areas with high sunlight.

## Where do they come from?

- Plants and animals have always moved around, but now move at a much faster rate.
- Plants that are native here are invasive in other places (e.g. rhododendrons in Ireland).
- Many of our invasive plants come from Eurasia or other places that share our latitude because of similarities in the amount of daylight over the year and severity of winter.
- 75% of invasive species are introduced intentionally (e.g. garden ornamental, food crops).

## Why is an invasive plant invasive?

- Only around 1% of introduced species become invasive.
- Some key characteristics:
  - A large north/south range in their native habitat
  - Lack of local predators, pests or diseases
  - Rapid growth and early maturity (e.g. filling space before native plants sprout)
  - Aggressive reproductive strategy (e.g. prolific seed production)
  - Vegetative reproduction (e.g. sprouting from root fragments)
  - Physically crowd out other plants (e.g. dense shade, root mass, chemical allelopathy)

## Why are they a problem?

- **Invasive plants can reduce native biodiversity and form monocultures.** Biodiversity is essential to the health and resilience of an ecosystem and the populations it supports.
- **Invasive plants alter habitat conditions and displace important native plant species.** Native plants fill unique ecological niches and evolved to form complex relationships with other native plants and animals.
- **Invasive plants threaten crops and other economically important plant populations.** Invasive plants and animals cost the US \$120 billion annually in damages and management.
- **Invasive plants threaten aesthetics and regional identity.** Pennsylvania has a unique selection of plants and animals that define our experience in the woodlands.

## What can we do about them?

- **Don't plant them!**
  - Many invasive species remain unlabeled and are sold in nurseries.
- **Mechanical management**
  - Many invasive plants can be cut or pulled by volunteers with little impact on the surrounding landscape.
  - Mechanical management may not be completely effective for all species.
- **Chemical management**
  - Herbicides can be safe and effective when used correctly.
  - Herbicides must be applied by a professional.
- **Biological management**
  - Releasing a predator or pest from an invasive plant's native environment can control its aggressive growth and reproduction.
  - Biological management is slow, expensive and does not completely eliminate the population of invasive species.

## General Site Visit Notes

- Safety is your first priority.
- Let someone know when you are working on your site alone.
- Wear long pants, gloves, and closed-toe shoes.
- Yellow flagging tied to a plant indicates a native species; pink or orange indicates a non-native or invasive species.
- Contact your Field Coordinator if you need a specific tool or have questions about restoration techniques.
- Be careful to remove any seeds from your clothes and mud from your boot tread to prevent the spread of invasive plants.
- Log your hours on the Urban EcoSteward website, [www.pittsburghparks.org/ueshours](http://www.pittsburghparks.org/ueshours), after each visit.

## General Site Safety

Steep slopes should be navigated carefully and with proper footwear, especially when the ground is wet or you are carrying sharp tools.

**Poison ivy** has a compound leaf with three lobed leaflets. The outer leaflets are often mitten-shaped, and the stem where the leaflets meet is often red. Poison ivy can also occur as a hairy vine. An itchy or painful rash develops several hours after contact with any part of the plant.



**Poison ivy**



If you come in contact with poison ivy, wash the area with soap, water, and medicated poison ivy wash (available over-the-counter). Clothing or tools that come in contact with poison ivy should also be washed.

**Stinging nettle** has a lance-shaped, strongly serrate opposite leaf and small green or brown flowers. The leaf and stem are covered in needles, which embed in the skin and contain a stinging chemical. An itchy or painful rash can develop immediately following contact.

If you come in contact with stinging nettle, wash the area with water or rubbing alcohol and gently pat dry. Baking soda may help to neutralize the reaction. Remove needles using tweezers or tape.

**Deer ticks**—and other types of ticks—may cause Lyme disease and/or other serious illnesses if they remain embedded in your skin. Perform a tick check after every site visit, being sure to check your whole body, both exposed and unexposed skin, and along your hairline.

If you find a tick, do not attempt to burn, smother, or drown it. Use tweezers to remove the tick, pulling with gentle, uniform pressure. Visit a doctor if a bulls-eye-shaped rash develops or you experience flu-like symptoms.

**Other hazards** such as glass or metal should only be handled using leather gloves and transported by bucket. Syringes should be carefully placed in a capped plastic bottle or other sealed container. If you are concerned about your safety, do not touch the item.

Photo by Frank Vincentz



**Stinging nettle**



Photo by Scott Bauer

**Deer ticks**



## General Notes for Managing Invasive Plants

### What to do...

- Remove invasive plants only after a positive ID has been made; you may have to wait until the leaves or flowers appear.
- Refer to other field guides for more detailed descriptions of native lookalikes.

### How to do it...

- Most herbaceous invasive plants can be pulled; those that reproduce vegetatively or by rhizomes should be dug up and allowed to dry on your site or be bagged and removed.
- Invasive trees and shrubs that are too difficult to pull should be cut at their base; controlled chemical treatment by your Field Coordinator may be required.
- Invasive vines should be cut once at eye level and once where they exit the ground; controlled chemical treatment by your Field Coordinator may be required. Do not pull down vines as you may injure other plants or dislodge overhanging dead branches.

### When to do it...

- Plants are easily pulled when the ground is wet.
- Remove as much of the plant's root system as possible.
- Whenever possible, manage invasive plants before the flowers or seeds appear; seeds should be bagged and removed or concentrated into a small area on your site.
- To be effective, it is essential that you make repeated visits to your site for continued management and monitoring.
- Refer to the calendar of invasives on page 80.





## HERBS



# Bull thistle

*Cirsium vulgare*

## Quick Identification Tips

**LEAF:** Simple, alternate, elongate, lobed with spines, hairy

**STEM:** 2–6 feet tall with spines

**FLOWER:** Pink-purple, spiny, 1–2 inches wide

**SEED:** Feathery, wind-dispersed

**ROOT:** Deep-growing taproot

**OTHER:** Large, round spiny structure (involucre) under flower head

**HABITAT:** Moist to dry soil, sun

## Management

**SEASON:** Spring to early summer

**LIFE CYCLE:** Biennial

**SPREAD BY:** Seed

Dig up the bull thistle's deep growing taproot, fold the plant over to prevent reestablishment, and leave it at your site before it flowers in mid-summer.

If the plant has flowered, cut and bag the flower head before digging up the taproot. Use care as the spines can pierce gloves.

## Native Look-alike

Field thistle and other native thistles have much smaller, inconspicuous flowers and involucre.

Bull thistle has sharp spines on its stem, leaves and globular structure beneath the flower (called an involucre).





# Burdock

*Arctium minus*

## Quick Identification Tips

**LEAF:** Simple, alternate, heart-shaped with rounded tip, entire to wavy

**STEM:** Up to 5 feet tall, hairy, hollow

**FLOWER:** Pink-purple globe, spiny

**SEED:** Burs with hooks that stick to clothing

**ROOT:** Deep-growing taproot

**OTHER:** Leaf stems are long and purple at base

**HABITAT:** Moist to dry soil, shade to sun

## Management

**SEASON:** Spring to early summer

**LIFE CYCLE:** Biennial

**SPREAD BY:** Seed

Dig up the burdock's deep growing taproot, fold the plant over to prevent reestablishment, and leave it at your site before it flowers in mid to late-summer.

If the plant has flowered, cut and bag the flower head before removing. Check your clothes for burs after working with the seed to reduce the risk of spread.

## Native Look-alike

None

Burdock produces seed pods called burs with hooks that cling to clothing.



# Canada thistle

*Cirsium arvense*



## Quick Identification Tips

**LEAF:** Simple, alternate, elongate, lobed with spines

**STEM:** Up to 4 ft tall, grooved, lacks spines

**FLOWER:** Pink/purple, ½ to 1 inch wide

**SEED:** Feathery, dispersed by wind

**ROOT:** Creeping perennial root

**OTHER:** Small, smooth, round structure (involucre) under flower head

**HABITAT:** Moist to dry soil, shade to sun

## Management

**SEASON:** Spring to early summer

**LIFE CYCLE:** Perennial

**SPREAD BY:** Seed, rhizome

Dig up the Canada thistle by the root, fold the plant over to prevent reestablishment, and leave it at your site before it flowers in mid-summer.

If the plant has flowered, cut and bag the flower head before removing. Use care as the spines can pierce gloves.

## Native Look-alikes

Native thistles often have hairy leaves, spiny involucre under their flowers or lack creeping perennial roots.

Prickly lettuce and sow thistle both have milky white sap when their leaves are broken off.

Canada thistle has spines at the tips of its leaves, but not on its stem.



# Chinese silvergrass

*Miscanthus sinensis*



## Quick Identification Tips

**LEAF:** Simple, alternate, blade with pointed tip, slightly serrate, up to 40 inches long

**STEM:** Stalks up to 15 feet tall

**FLOWER:** Pink/silver, branched and drooping, up to 35cm long

**SEED:** Rough with a twisted bristle at tip

**ROOT:** Thick, fibrous

**OTHER:** Silver midvein on leaf

**HABITAT:** Moist to dry, sun

## Management

**SEASON:** Early to late summer

**LIFE CYCLE:** Perennial

**SPREADS BY:** Rhizomes, seed

Because Chinese silvergrass reproduces primarily by rhizomes, chemical control is usually required. If you find Chinese silvergrass growing on your site, contact your coordinator and monitor the site for spread. If the patch is small and isolated, remove and bag the entire plant (including the root mass), or cut and bag all seed.

If unmanageable, contact your coordinator as chemical control may be required.



## Native Look-alikes

Big bluestem has a three-pronged flower head.

Sugarcane plumegrass has longer flower stalks (up to 12 feet tall) and a shorter leaf (up to 2 feet long).

Chinese silvergrass has a silver midvein running down its leaves.





# Crown vetch

*Coronilla varia*



## Quick Identification Tips

**LEAF:** Pinnately compound, alternate, elongate with oval-shaped leaflets, entire

**STEM:** Low-growing ground cover

**FLOWER:** Globe-shaped cluster of irregular pink flowers

**SEED:** Long, thin seedpod

**ROOT:** Fibrous, deep-growing rhizomes

**OTHER:** Creeping branches up to 5 feet long

**HABITAT:** Dry to moist soil, sun

## Management

**SEASON:** Spring to mid summer

**LIFE CYCLE:** Perennial

**SPREADS BY:** Rhizomes (primary), vegetative

Dig up or hand-pull crown vetch, taking care to remove as much of the thick root mass as possible, preferably before it flowers in mid to late summer.

If unmanageable, contact your coordinator as chemical control may be required.

## Native Look-alike

American vetch has leaves that are similar, but less uniform in size and fewer in number than crown vetch. The leaves also have stipules at their base and a tendrils at their tip.

Crown vetch has alternate leaf arrangement (however, the leaflets have opposite arrangement).





Garlic mustard is low growing in its first year (top) and tall growing in its second year (bottom) when it flowers and seeds.

# Garlic mustard



*Alliaria petiolata*

## Quick Identification Tips

- LEAF:** Simple, alternate, round or kidney-shaped, wavy
- STEM:** Purple and hairy near base
- FLOWER:** White, four petals, small, clustered at tip of stalk
- SEED:** Long, thin seedpods branching from stalk
- ROOT:** Shallow taproot
- OTHER:** Leaves produce garlic smell when crushed
- HABITAT:** Moist to dry soil, sun to shade

## Management

- SEASON:** Early to late spring
- LIFE CYCLE:** Biennial
- SPREADS BY:** Seed

Short first-year garlic mustard plants should be hand-pulled by the base of the plant, folded over to prevent reestablishment, and left in a pile on your site to dry at any point during the year. Tall second-year plants should be pulled before they start to flower in early to mid-spring, folded over to prevent reestablishment, and left in a pile at your site. If the plant has begun to flower, pile it at your site to condense the seed bank or bag and remove the plants.

## Native Look-alikes

Common violets have a similar leaf shape, but are low-growing, have a purple flower, and lack the garlic smell when crushed.

White avens have similar, but coarsely serrate, lobed leaves and lack the garlic smell when crushed.

Sweet cicely has similar flowers but has compound leaves and lacks the garlic smell and taste.



Photos by Donna R. Ellis, University of Connecticut, Bugwood.org

# Giant hogweed

*Heracleum mantegazzianum*



## Quick Identification Tips

**LEAF:** Palmately compound, alternate, elongate, deeply lobed with coarse and fine teeth, up to 5 feet across

**STEM:** Hollow, hairy, with purple spots

**FLOWER:** White, compound, umbrella-shaped, up to 2 feet across

**SEED:** Broad, flat and oval-shaped

**ROOT:** Deep-growing taproot

**OTHER:** Giant hogweed can grow up to 8 feet tall

**HABITAT:** Moist soil, full sun

## Management

**SEASON:** Mid spring to late summer

**LIFE CYCLE:** Biennial or perennial

**SPREADS BY:** Seed

Flag the plant and notify your coordinator of its presence and location. Contact with giant hogweed can cause a serious skin irritation and should be handled with caution.

## Native Look-alike

Cow parsnip has compound leaves with shallower lobes and flat-topped flowers; its leaves and flowers are both smaller.

Giant hogweed leaves and flowers can be several feet across.



# Goutweed

*Aegopodium podagraria*



## Quick Identification Tips

**LEAF:** Pinnately compound (three leaflets), alternate, elongate, serrate

**STEM:** Low-growing

**FLOWER:** White, compound, flat umbrella shape

**SEED:** Small, elongate

**ROOT:** Fibrous rhizomes

**OTHER:** Leaves can be green or variegated green and white

**HABITAT:** Moist soil, light shade

## Management

**SEASON:** Spring to early summer

**LIFE CYCLE:** Perennial

**SPREADS BY:** Rhizomes

Dig up or hand-pull goutweed taking care to completely remove the root mass before it flowers in early to late summer.

If unmanageable, contact your coordinator as chemical control may be required.

## Native Look-alike

Sweet cicely has similar leaves but smaller flower clusters.

Goutweed has compound leaves with serrated margins.





# Japanese knotweed

*Polygonum cuspidatum*

## Quick Identification Tips

**LEAF:** Simple, alternate, heart-shaped with pointed tip, entire

**STEM:** Light green, hollow, smooth, zig-zags at swollen red joints

**FLOWER:** Green-white, feathery

**SEED:** Papery, round, white

**ROOT:** Fibrous rhizomes

**OTHER:** Young shoots resemble asparagus

**HABITAT:** Wet to dry soil, shade to sun

## Management

**SEASON:** Early spring to late summer

**LIFE CYCLE:** Perennial

**SPREADS BY:** Rhizomes (primary), vegetative, seed

Reduce vigor and limit seed production by cutting or bending Japanese knotweed to the ground repeatedly throughout the spring and summer, working from the edges to control spread before it flowers in the late summer. If you are in a flood zone, consider bagging all plant material and taking off site.

If unmanageable, contact your coordinator as chemical control may be required.

## Native Look-alike

None

Japanese knotweed stems are hollow and red at the joints.





Japanese stiltgrass has jointed stems and a silver midvein on its leaves.

# Japanese stiltgrass

*Microstegium viminium*



## Quick Identification Tips

**LEAF:** Simple, alternate, blade with pointed tip, entire, up to 3 inches long

**STEM:** Low-growing, hollow, jointed

**FLOWER:** On stalks or indistinct

**SEED:** Hairy, occurs on spike

**ROOT:** Shallow, fibrous

**OTHER:** Shiny silver midvein along leaf

**HABITAT:** Moist soil, shade to sun

## Management

**SEASON:** Mid spring to late summer

**LIFE CYCLE:** Annual

**SPREADS BY:** Seed, rhizomes, vegetative

Japanese stilt grass reproduces by seed. Pull and bag the plant, including the root system. This is easier and more effective later in the season when the plants are larger. Ideally, plants should be pulled when they are flowering, but have not yet started to produce seed. The plant flowers in the late summer.

Seeds often spread by sticking in boots and bike tire tread.



## Native Look-alike

Virginia cutgrass and other native grasses lack the shiny silver midvein on their leaves.



# Mugwort

*Artemisia vulgaris*



## Quick Identification Tips

**LEAF:** Simple, alternate, elongate, deeply lobed with coarse teeth and rounded tips, hairy and silver underside

**STEM:** Green to purple, herbaceous to woody, with ridges, hairy

**FLOWER:** Yellow, indistinct

**SEED:** Small seed pod

**ROOT:** Rhizomes

**OTHER:** Leaves have distinct herbal smell

**HABITAT:** Moist to dry soil, sun

## Management

**SEASON:** Early spring to late fall

**LIFE CYCLE:** Perennial

**SPREADS BY:** Rhizomes

Mugwort can be hand pulled at any time of the year, taking care to remove as much of the rhizome as possible. Rhizomes may re-sprout in the following year, but repeated removal will control it.

## Native Look-alike

Common ragweed lacks the herbal smell and has a more finely cut leaf.

Mugwort has a deeply lobed leaf that has a distinct herbal smell.



# Periwinkle

*Vinca minor*

## Quick Identification Tips

**LEAF:** Simple, opposite, elongate, entire, dark green

**STEM:** Low-growing ground cover

**FLOWER:** Periwinkle blue, five petals

**SEED:** None

**ROOT:** Fibrous, rhizomes

**OTHER:** Leaves are thick and evergreen

**HABITAT:** Moist soil, sun to shade

## Management

**SEASON:** Year round

**LIFE CYCLE:** Perennial

**SPREADS BY:** Rhizomes, bolting

Pull periwinkle by hand, taking care to remove runners (the primary method of reproduction). Concentrate efforts on small patches and the edges of large infestations to prevent their spread.

If unmanageable, contact your coordinator as chemical control may be required.

## Native Look-alike

No native lookalikes

Periwinkle has a pale blue flower and thick evergreen leaves.





John Cardina, The Ohio State University, Bugwood.org



# Poison hemlock

*Conium maculatum*



## Quick Identification Tips

**LEAF:** Twice pinnately compound, alternate, triangular, fernlike

**STEM:** Hollow, purple spotted, with ridges

**FLOWER:** White, compound, cluster forms umbrella

**SEED:** Ovate with ridges

**ROOT:** Long white taproot with fibrous roots

**OTHER:** Poison hemlock is extremely poisonous if ingested

**HABITAT:** Moist to dry soil, sun to shade

## Management

**SEASON:** Spring to fall

**LIFE CYCLE:** Biennial

**SPREADS BY:** Seed

Mechanical control of poison hemlock is fairly easy by means of hand pulling or grubbing. Poison hemlock is extremely poisonous if ingested; always use gloves when handling and avoid contact with skin. Removing the entire root is not necessary. Mowing of poison hemlock may also be effective if done before flowering.



## Native Look-alike

Wild carrot has a flat-topped flower and a hairy stem with no purple spots.

Poison hemlock has a hairy and spotted stem.



# Purple loosestrife

*Lythrum salicaria*



## Quick Identification Tips

**LEAF:** Simple, alternate, elongate with pointed tip, entire, hairy

**STEM:** Woody, green with brown base, noticeably square edges

**FLOWER:** Bright purple, six petals, occurs along spike

**SEED:** Pod containing tiny reddish brown seeds

**ROOT:** Shallow, thick

**OTHER:** Usually multistemmed

**HABITAT:** Wet soil, sun

## Management

**SEASON:** Late spring to early summer

**LIFE CYCLE:** Perennial

**SPREADS BY:** Rhizomes, vegetative, seed

Cut or pull small stands in late spring, being careful to bag and remove all plant material. It can resprout from the root, so monitor for regrowth. Consult your coordinator regarding large stands.

## Native Look-alikes

Fireweed has alternate leaves and a round stem.

Blazing star has only one flowering stalk.

Blue vervain has a serrated leaf.

Purple loosestrife has a woody, noticeably square stem.



## SHRUBS



# Bush honeysuckle

*Lonicera spp.*

## Quick Identification Tips

**LEAF:** Simple, opposite, elongate with pointed tip, entire

**STEM:** Light-brown, lined bark when mature, hollow

**FLOWER:** White or yellow, prominent stamens, in pairs

**FRUIT:** Fruit are round and red to orange

**ROOT:** Deep growing when mature

**OTHER:** Foliage appears in early spring and remains into winter

**HABITAT:** Moist to dry soil, shade to sun

## Management

**SEASON:** Year round

**LIFE CYCLE:** Perennial

**SPREADS BY:** Seed

When young, pull bush honeysuckle by hand or completely remove it using a honeysuckle popper or shovel. If the plant is too large or difficult to remove, cut it at its base before flowering to prevent seeding. Use particular caution to ensure the identity of this plant as it closely resembles native mock orange.

## Native Look-alikes

Mock orange has white pith in mature stems (not hollow) and round leaves with toothed margins.

Native bush honeysuckles have solid stems and blue or black fruit.

**Mature bush honeysuckle trunks can grow to be several inches thick, with hollow pith.**





# Common buckthorn

*Rhamnus cathartica*



## Quick Identification Tips

**LEAF:** Simple, opposite OR alternate, oval-shaped with pointed tip, serrate

**STEM:** Grey to brown, rough, light lenticels

**FLOWER:** Greenish-yellow, four petals

**SEED:** Round, black

**ROOT:** Deep growing when mature

**OTHER:** Thorn protrudes between buds at end of twig

**HABITAT:** Moist to dry soil, shade to sun

## Management

**SEASON:** Year round

**LIFE CYCLE:** Perennial

**SPREADS BY:** Seed

Small common buckthorn plants can be pulled or dug out, taking care to remove as much root material as possible. Larger plants should be cut to the ground in summer to prevent them from going to seed or, if possible, pulled out with a weed wrench. Use leather gloves to protect from thorns.

## Native Look-alikes

Carolina buckthorn and alder buckthorn have alternate branching patterns and more gradually come to a point at the tip.

Thorns protrude from between two buds at the tips of buckthorn branches.



# European privet

*Ligustrum vulgare*

## Quick Identification Tips

**LEAF:** Simple, opposite, elongate, entire, short stems

**STEM:** Smooth grey bark, opposite

**FLOWER:** White, occurs in clusters at end of stalk

**SEED:** Small, hard, green or blue-black berries

**ROOT:** Deep growing when mature

**OTHER:** Leaves often persist through winter

**HABITAT:** Moist soil, sun to shade

## Management

**SEASON:** Year round

**LIFE CYCLE:** Perennial

**SPREAD BY:** Seed, rhizomes

Small European privet plants can be pulled or dug out, taking care to remove as much root material as possible. Larger plants should be cut to the ground in summer to prevent them from going to seed or, if possible, pulled out with a weed wrench.

## Native Look-alike

None

Privet produces hard green berries that turn black in the fall.



A single thorn occurs at each node along the stem.

# Japanese barberry

*Berberis thunbergii*



## Quick Identification Tips

**LEAF:** Simple, alternate, tear-drop to oval-shaped, entire, green to purple

**STEM:** Grey, grooved, arching, with spines

**FLOWER:** Bright yellow, unpleasant odor

**SEED:** Red fruit hangs from branches

**ROOT:** Shallow and yellow

**OTHER:** Single spine at leaf nodes

**HABITAT:** Moist to dry soil, sun to shade

## Management

**SEASON:** Year round

**LIFE CYCLE:** Perennial

**SPREADS BY:** Seed, bolting

Japanese barberry plants have a shallow root system, which makes them easy to hand-pull or dig out. Larger plants may be cut to the ground in summer to prevent them from going to seed or, if possible, pulled out with a weed wrench. Use leather gloves to protect from thorns.

## Native Look-alike

Allegheny barberry has three spines at its leaf node and a sharply toothed leaf.

European barberry is another non-native invasive but is very difficult to distinguish from the native barberry because it also has serrate leaves and 2-3 spines at each node. Work with your coordinator to correctly identify this plant before removal.





# Jetbead

*Rhodotypos scandens*



## Quick Identification Tips

**LEAF:** Simple, opposite, elongate with pointed tip, doubly-serrate

**STEM:** Grey with lenticels

**FLOWER:** White, four petals, clustered

**SEED:** Small black berries in groups of four, persist in winter

**ROOT:** Deep growing when mature

**OTHER:** Leaves are rough with deep veins

**HABITAT:** Moist to dry soil, shade to sun

## Management

**SEASON:** Year round

**LIFE CYCLE:** Perennial

**SPREADS BY:** Seed

Small jetbead plants can be hand-pulled or dug out, taking care to remove as much root material as possible. Larger plants should be cut to the ground in summer to prevent them from going to seed or, if possible, pulled out with a weed wrench.

## Native Look-alike

Southern arrowwood has a coarsely toothed, singly serrate leaf.

Jetbead berries form in square clusters of four and can persist into the winter.



# Multiflora rose



*Rosa multiflora*

## Quick Identification Tips:

**LEAF:** Pinnately compound (5–11 leaflets), alternate, elongate with pointed tip, serrate

**STEM:** Arched, with reverse-facing thorns

**FLOWER:** White-pink, five petals, occurs in clusters of many flowers

**SEED:** Red berries

**ROOT:** Shallow

**OTHER:** Pair of fringed stipules at base of leaf

**HABITAT:** Moist to dry soil, sun to shade

## Management

**SEASON:** Year round

**LIFE CYCLE:** Perennial

**SPREAD BY:** Seed, bolting

Multiflora rose plants should be dug up, pulled out, or cut to the ground four–six times a year. Seedlings can be hand pulled at any time of year. Use leather gloves to protect from thorns.

## Native Look-alike

Native roses have entire (unfringed) stipules and a few pink flowers that occur in clusters.

Multiflora rose has fringed stipules at the base of its compound leaves.



# Winged burning bush

*Euonymus alatus*



## Quick Identification Tips

**LEAF:** Simple, opposite, elongate with pointed tip, finely serrate

**STEM:** Two or four prominent lengthwise wings

**FLOWER:** Yellowish-green, small

**SEED:** Purple to red capsule

**ROOT:** Deep growing when mature

**OTHER:** Leaf is a brilliant red-purple in the fall

**HABITAT:** Moist soil, shade to sun

## Management

**SEASON:** Year round

**LIFE CYCLE:** Perennial

**SPREADS BY:** Seed

Small winged burning bush plants can be pulled or dug out, taking care to remove as much root material as possible.

Larger plants should be cut to the ground in summer to prevent them from going to seed or, if possible, pulled out with a weed wrench.

## Native Look-alike

Native euonymus lacks the wings along the stem and has a bright pink to red capsule.

Winged burning bush has small ridges running the length of the stem.





English ivy has evergreen leaves with defined veins and three to five lobes.

## VINES



# English ivy

*Hedera helix*

## Quick Identification Tips

**LEAF:** Simple, alternate, round, lobed (3-5) with pointed tips, waxy with white veins

**STEM:** Creeping, hairy vine

**FLOWER:** Green-yellow

**SEED:** Purple-black fruit contain orange-yellow seed

**ROOT:** Fibrous

**OTHER:** Evergreen, leaves persist through winter

**HABITAT:** Moist soil, sun to shade

## Management

**SEASON:** Year round

**LIFE CYCLE:** Perennial

**SPREAD BY:** Rhizomes, trailing, climbing, vegetative, seed

English ivy mostly spreads via root fragmentation, so it is important when controlling it manually to remove as much of the root as possible. Focus on small patches and the edges of large infestations. If it is climbing a tree, cut the vine once at eye level and once where it exits the ground.

## Native Look-alike

Poison ivy vines are also hairy but have a simple leaf that does not persist through winter.

Virginia creeper vines are also hairy, but have palmately compound leaves.



# Japanese honeysuckle

*Lonicera japonica*



## Quick Identification Tips:

**LEAF:** Simple, opposite, oval-shaped with pointed tip, entire

**STEM:** Smooth, green to reddish

**FLOWER:** White-yellow, trumpet-shaped

**SEED:** Black berries

**ROOT:** Shallow

**OTHER:** Leaves persist through winter

**HABITAT:** Moist to dry soil, sun

## Management

**SEASON:** Year round

**LIFE CYCLE:** Perennial

**SPREAD BY:** Trailing, rhizomes, seed

Control Japanese honeysuckle by pulling small vines up by the root year round. If it is climbing a tree, cut the vine once at eye level and once where it exits the ground. Be sure to cut and remove vines that are constricting tree trunks. Monitor for regrowth.

## Native Look-alike

Native honeysuckle has a red-orange flower and red berries.

Young Japanese honeysuckle vines are green or pink, while mature vines are darker.



# Mile-a-minute

*Polygonum perfoliatum*



## Quick Identification Tips

**LEAF:** Simple, alternate, triangular, entire, spines on underside

**STEM:** Pink to green with reverse-facing spines along stem

**FLOWER:** Inconspicuous, closed

**SEED:** Metallic blue fruit, cone-shaped cluster

**ROOT:** Shallow

**OTHER:** Leaf-like disks (ocrea) occur along stem

**HABITAT:** Moist to dry soil, sun

## Management

**SEASON:** Mid spring to late summer

**LIFE CYCLE:** Annual

**SPREAD BY:** Seed, trailing, climbing

Mile-a-minute seedlings and vines can be easily pulled by hand before flowering. New seedlings will emerge throughout the season, so repeated removal is necessary. If the plant is flowering, remove and bag the seed. Wear gloves and long sleeves to protect from spines.

## Native Look-alikes

Harbard-leaved tearthumb has two lobes at the base of each leaf and no ocrea.

Other lookalikes frequently lack ocrea and thorns, or have tendrils.

Mile-a-minute has unique leaf-like discs (called ocrea) at each node along its stem.





# Oriental bittersweet

*Celastrus orbiculatus*



## Quick Identification Tips

**LEAF:** Simple, alternate, round to oval-shaped with pointed tips, finely serrate

**STEM:** Grey, woody

**FLOWER:** Green, small, along stem

**SEED:** Yellow capsule containing red-orange fruit

**ROOT:** Orange-red, shallow

**OTHER:** Vines can be up to four inches thick

**HABITAT:** Moist to dry soil, sun to shade

## Management

**SEASON:** Year round

**LIFE CYCLE:** Perennial

**SPREAD BY:** Seed, trailing, climbing

If the roots are shallow and can be easily pulled, remove and cut oriental bittersweet vines once at eye level before the plant flowers. If the plant cannot be pulled, cut it once where it exits the ground and once at eye level. Carefully cut and remove vines constricting trees or shrubs. Do not pull vines down from tree canopy.

## Native Look-alike

American bittersweet flowers at the tips of its stem while oriental bittersweet flowers along the stem.

**Middle & lower right: Oriental bittersweet bears beautiful bright red and orange fruit in the fall.**



# Porcelainberry



*Ampelopsis brevipedunculata*

## Quick Identification Tips

**LEAF:** Simple, alternate, heart-shaped, coarsely toothed, shallow to deeply lobed (3-5) with pointed tips

**STEM:** Smooth, with tendrils, lenticels, and white pith

**FLOWER:** Small, greenish-yellow, appears in mid summer

**SEED:** Iridescent white, purple, or blue berries

**ROOT:** Deep growing

**OTHER:** Both the leaves and young twigs are hairy

**HABITAT:** Moist soil, sun to part shade

## Management

**SEASON:** Year round; best to pull or cut before mid summer when the seed sets

**LIFE CYCLE:** Perennial

**SPREAD BY:** Climbing, trailing, seed

Pull porcelainberry vines out by their roots when young. If mature, cut the vines once where it exits the ground and once at eye level. Carefully cut and remove constricting vines from trees or shrubs. Do not pull vines down from tree canopy. Vines regenerate, so monitoring and repeat care is required.

## Native look-alike

Wild grape vine has flakey bark and no lenticels; wild grape may also become invasive in high-light environments.

Virginia creeper has a compound leaf with five leaflets and less conspicuous tendrils.

Porcelainberry resembles wild grape but bears iridescent white, purple and blue berries.



# Wild grape

*Vitis spp.*



## Quick Identification Tips

**LEAF:** Simple, alternate, heart-shaped, coarsely toothed, shallowly lobed (3-5) with pointed tips

**STEM:** Flakey rough bark when mature, smoother with tendrils when young

**FLOWER:** Small, greenish-yellow, form in long clusters

**SEED:** Small green berries eventually turn purple-black

**ROOT:** Deep growing

**OTHER:** Pith in mature vines can be white or brown

**HABITAT:** Moist soil, sun to part-shade

## Management

**SEASON:** Year round

**LIFE CYCLE:** Perennial

**SPREAD BY:** Climbing, trailing, seed

Pull the vines out by their roots when young. If mature, cut the vines once where it exits the ground and once at eye level. Carefully cut and remove constricting vines from trees or shrubs. Do not pull vines down from tree canopy. Vine regenerates, so monitoring and repeat care is required.



## Native look-a-like

Virginia creeper has a compound leaf with 5 leaflets and less conspicuous tendrils.

Mature wild grape vines have peeling brown bark and tendrils.





James H. Miller, USDA Forest Service, Bugwood.org

# Winter creeper



*Euonymus fortunei*

## Quick Identification Tips:

**LEAF:** Simple, opposite, oval-shaped, serrate, thick

**STEM:** Woody, smooth, climbing or trailing

**FLOWER:** Yellow-green

**SEED:** Pale white to brown capsule

**ROOT:** Deep growing

**OTHER:** Evergreen, variegated

**HABITAT:** Moist soil, sun to shade

## Management

**SEASON:** Year round

**LIFE CYCLE:** Perennial

**SPREADS BY:** Climbing, trailing, seed

Light infestations of winter creeper can be controlled with hand pulling or by digging it up by the root, making sure to remove all runners and checking for new sprouting afterward. For heavier infestations, consult your coordinator as chemical treatment may be required.

## Native look-alike

Native euonymus and has a bright pink to red seed capsule.

Wild grape is a native species that becomes invasive in high-light areas.

Winter creeper has opposite evergreen leaves and a hard woody stem.



Callery pear produces white flowers that give off a powerful odor.

## TREES

# Callery pear

*Pyrus calleryana*

### Quick Identification Tips:

**LEAF:** Simple, alternate, serrate, oval-shaped with pointed tip

**BARK:** Grey-brown, scaly

**FLOWER:** White, five petals; foul-smelling

**FRUIT:** Brown, small, hard

**BUD:** Large, covered in white wooly substance

**OTHER:** May have thorns

**HABITAT:** Moist to dry, sun

### Management

**SEASON:** Spring or summer

**LIFE CYCLE:** Perennial

**SPREADS BY:** Seed

Pull, dig out or cut back Callery pear saplings in the spring. For mature trees, consult your coordinator before girdling in spring or early summer.

### Native look-alike

None



# Norway maple



*Acer platanoides*

## Quick Identification Tips:

**LEAF:** Simple, opposite, round, lobed (5) and coarsely toothed with pointed tips, milky white sap

**BARK:** Light grey, smooth

**FLOWER:** Yellow, clustered, appears in spring

**SEED:** Samara with wide-angled wings

**BUD:** Large, blunt, with overlapping bud scales

**OTHER:** Leaves retain color longer, turn bright yellow in fall

**HABITAT:** Moist to dry, sun to shade

## Management

**SEASON:** Spring or winter

**LIFE CYCLE:** Perennial

**SPREAD BY:** Seed

Pull, dig out or cut back Norway maple saplings in the spring. For mature trees, consult your coordinator before girdling in mid winter.

## Native look-alike

Sugar maples lack the milky white sap, and have more U-shaped lobes and imbricate bud scales.

When broken off, the stem of Norway maple leaves produce a white sap.





# Princess tree

*Paulownia tomentosa*



## Quick Identification Tips

**LEAF:** Simple, opposite, heart-shaped, entire to coarsely toothed, hairy

**BARK:** Green-grey, white lenticels, can be hollow

**FLOWER:** Pale-violet, showy, in clusters

**SEED:** Brown capsule, four compartments

**BUD:** Terminal bud absent

**OTHER:** Mature leaves display small pointed lobes

**HABITAT:** Moist to dry soil, sun

## Management

**SEASON:** Early spring

**LIFE CYCLE:** Perennial

**SPREAD BY:** Seed, vegetative

Pull or dig up princess tree saplings, being careful to remove the entire root mass as fragments may resprout. For mature trees, consult your coordinator, as chemical treatment may be required.

## Native look-alike

Hardy catalpa has long pods containing seeds, rather than a capsule; non-hollow stems; and a dramatically pointed tip.

Princess trees produce brown seed capsules with four compartments.



# Siberian elm

*Ulmus pumila L.*



## Quick Identification Tips

**LEAF:** Simple, alternate, oval-shaped with pointed tip, serrate

**BARK:** Light grey, irregular grooves

**FLOWER:** Green, lacks petals, occurs in clusters

**SEED:** Flat, circular, winged

**BUDS:** Occurs at turn of zig-zag twigs

**OTHER:** Leaf is slightly uneven at base

**HABITAT:** Dry to moist soil, sun

## Management

**SEASON:** Early to late spring

**LIFE CYCLE:** Perennial

**SPREADS BY:** Seed

Pull, dig out or cut back and flag Siberian elm saplings in the spring. For mature trees, consult your coordinator before girdling in late spring. Limited and controlled chemical treatment may also be required.

## Native look-alikes

American elms and slippery elms have a much more uneven leaf base and significantly larger leaves when mature.

Siberian elms have smaller leaves than most other elms.



# Sycamore maple

*Acer pseudoplatanus*



## Quick Identification Tips

**LEAF:** Simple, opposite, round, lobed (3-5, rounded) and coarsely toothed

**BARK:** Brown-grey, flakey when mature

**FLOWER:** Yellow-green, small, appears in May

**FRUIT/SEED:** Samara

**BUDS:** Green, occur in pairs

**OTHER:** Prominent veins cause leathery leaf to seem wavy

**HABITAT:** Moist soil, sun to shade

## Management

**SEASON:** Spring

**LIFE CYCLE:** Perennial

**SPREAD BY:** Seed

Pull, dig out or cut back and flag sycamore maple saplings in the spring. For mature trees, consult your coordinator before girdling in early spring. Limited and controlled chemical treatment may also be required.

## Native look-alikes

Red maple and sugar maple lack the rounded leaf tips and flaking bark.

The bark of a Sycamore maple is flakey and resembles a sycamore's bark.





# Tree of heaven

*Ailanthus altissima*



## Quick Identification Tips

**LEAF:** Pinnately compound (11–41 leaflets), alternate, elongate with pointed tip, entire with lobe at base

**BARK:** Grey-brown, smooth, large bud scar

**FLOWER:** Yellow-green, 5–6 petals, small, clustered

**SEED:** Long, flat, winged

**BUDS:** Small, no terminal bud

**OTHER:** Leaves are foul smelling with a single lobe at the base

**HABITAT:** Dry to moist soil, sun to shade

## Management

**SEASON:** Spring

**LIFE CYCLE:** Perennial

**SPREAD BY:** Seed, rhizomes, vegetative

Pull or dig out young tree of heaven seedlings, including the entire root mass in the spring. Take care to remove all plant material, as any fragments can resprout. If difficult to remove, consult your coordinator, as limited and controlled chemical treatment may be required. Cutting mature trees will prevent seed production, though aggressive resprouting from the root and stumps will occur.



## Native look-alikes

Sumac and black walnut leaves have serrate margins, while tree of heaven has entire margins.

Tree of heaven leaves have entire margins except for small lobes at the base of the leaflets.

Calendar of Invasives Management

| PLANT NAME |                      | MARCH                          | APRIL     | MAY |
|------------|----------------------|--------------------------------|-----------|-----|
| HERBS      | Bull Thistle         | Manage                         |           |     |
|            | Burdock              | Manage                         |           |     |
|            | Canada Thistle       | Manage                         |           |     |
|            | Chinese Silvergrass  | Only manually remove before it |           |     |
|            | Crown Vetch          | Manage                         |           |     |
|            | Garlic Mustard       | Manage                         | Flowering |     |
|            | Giant Hogweed        | Flag for chemical              |           |     |
|            | Japanese Knotweed    | Manage                         |           |     |
|            | Japanese Stilt Grass | Manage                         |           |     |
|            | Mugwort              | Manage                         |           |     |
|            | Periwinkle           | Manage                         |           |     |
|            | Poison Hemlock       | Manage/Flag                    |           |     |
|            | Purple Loosestrife   | Manage                         |           |     |
| SHRUBS     | Burning Bush         | Manage                         |           |     |
|            | Bush Honeysuckle     | Manage                         | Flowering |     |
|            | Common Buckthorn     | Manage                         |           |     |
|            | European Barberry    | Manage                         | Flowering |     |
|            | Japanese Barberry    | Manage                         | Flowering |     |
|            | Jetbead              |                                | Flowering |     |
|            | Multiflora Rose      | Manage                         | Flowering |     |
|            | Privet               |                                | Flowering |     |
| VINES      | English Ivy          | Manage                         |           |     |
|            | Japanese Honeysuckle | Manage                         |           |     |
|            | Mile-a-Minute        | Manage                         |           |     |
|            | Oriental Bittersweet | Manage                         |           |     |
|            | Porcelainberry       | Manage                         |           |     |
|            | Winter Creeper       | Manage                         |           |     |
| TREES      | Callery Pear         | Flowering                      | Manage    |     |
|            | Norway Maple         | Manage                         |           |     |
|            | Princess Tree        | Manage                         | Flowering |     |
|            | Siberian Elm         | Manage                         | Seeding   |     |
|            | Sycamore Maple       | Manage                         |           |     |
|            | Tree of Heaven       | Manage                         |           |     |

SEE individual plant pages for specific management, flowering, seed and flag info

|     | JUNE                                          | JULY      | AUGUST            | SEPTEMBER                    | OCTOBER |
|-----|-----------------------------------------------|-----------|-------------------|------------------------------|---------|
| BT  | Flowering                                     |           |                   |                              | Manage  |
| B   | Flowering                                     |           |                   |                              |         |
| CT  | Flowering                                     |           |                   |                              |         |
| CS  | has started to seed. Flag for chemical manage |           |                   |                              |         |
| CV  | Flowering                                     |           |                   |                              | Manage  |
| GM  | Flowering/Seeding                             |           |                   |                              | Manage  |
| GH  | management by coordinator                     |           |                   |                              |         |
| JK  | Manage                                        |           | Flowering         |                              |         |
| JSG | Manage                                        | Flowering |                   | Flag for chemical management |         |
| M   | Manage                                        |           |                   |                              |         |
| P   | Manage                                        |           |                   |                              |         |
| PH  | Manage                                        |           | Flowering/Seeding |                              |         |
| PL  | Flowering                                     |           |                   |                              | Manage  |
| BB  | Manage                                        |           |                   | Flowering                    |         |
| BH  | Flowering                                     | Manage    |                   |                              |         |
| CB  | Manage                                        |           |                   |                              |         |
| EB  | Flowering                                     |           | Manage            |                              |         |
| JB  | Flowering                                     |           | Manage            |                              |         |
| J   | Flowering                                     | Manage    |                   |                              | Seeds   |
| MR  | Flowering                                     | Manage    |                   |                              |         |
| P   | Flowering                                     | Manage    |                   |                              |         |
| EI  | Manage                                        |           |                   |                              |         |
| JH  | Manage                                        |           |                   |                              |         |
| MaM | Manage                                        | Flowering |                   |                              |         |
| OB  | Manage                                        |           |                   | Seeding                      |         |
| P   | Manage                                        | Flowering |                   |                              | Manage  |
| WC  |                                               | Flowering |                   | Manage                       |         |
| CP  | Manage                                        |           |                   |                              |         |
| NM  | Manage                                        |           | Seeding           |                              |         |
| PT  | Seeding                                       |           |                   |                              |         |
| SE  | Manage                                        |           |                   |                              |         |
| SM  | Manage                                        |           | Seeding           |                              |         |
| ToH | Manage                                        |           | Seeding           |                              |         |

IT IS IDEAL to manage invasive plants before they drop their seed, but most biennials and perennials can be managed throughout their lifecycles.

# Glossary

**Allelopathy:** The secretion of chemicals that inhibits the growth of other nearby plants

**Alternate arrangement/branching:** Leaves, buds and branches occur individually (not in pairs) at each node along the stem, alternating between the left and right sides

**Annual:** A plant that dies at the end of each growing season

**Axil:** Junction of a leaf or branch and the stem

**Basal:** At or near the base of the plant

**Biennial:** A plant with a two-year life cycle, usually only flowering in the second year

**Bract:** A modified leaf arising below a flower or inflorescence

**Compound leaf:** A leaf that is composed of two or more blades, called leaflets; a single bud is present at the base of a compound leaf, but not at the base of leaflets

**Deciduous:** Plants that shed all their leaves each year, usually in the fall

**Doubly serrate margin:** Leaf edge has teeth pointing toward the leaf tip that are themselves serrate along its whole length

**Entire leaf margin:** The leaf edge is smooth along its whole length, with no teeth or lobes

**Evergreen:** Plants that keep all or the majority of their leaves over winter

**Herbaceous:** Plants with a green, non-woody stem

**Imbricate:** Bud scales overlap, resemble shingles on a roof

**Inflorescence:** A grouping or cluster of flowers

**Invasive plant:** A plant that can grow and reproduce quickly, to the extent that it displaces other species that are growing in the area

**Involucre:** A series of bracts occurring subordinate to a flower

**Leaf:** The photosynthetic organ of a plant

**Leaflet:** Together with other leaflets, forms compound leaves

**Lenticels:** Small circular or elongated openings allowing gas-exchange on the surface of the bark of woody stems; appear as spots

**Lobed leaf margin:** The leaf edge has deep indentations that create lobes along its whole length

**Node:** Points along the stem at which buds, branches, or leaves occur

**Noxious weed:** A plant determined by Pennsylvania law to be injurious to public health, crops, livestock, agricultural land or other property

**Ocrea:** Leaf-like discs occurring at nodes along the stem

**Opposite arrangement/branching:** Leaves, buds and branches occur in pairs across from each other along the stem at each node

**Perennial:** An herbaceous plant living for more than two years

**Rhizome:** An underground stem that can produce new shoots

**Rosette:** A circular cluster of leaves radiating from the stem at ground level

**Serrate margin:** The leaf edge has teeth pointing toward the tip of the leaf along its whole length

**Simple leaves:** A leaf with a single blade and no divisions (as opposed to a compound leaf); has a single bud at the base of the leaf

**Stipule:** Small, leaf-like growths at the base of a leafstalk

**Tendrils:** Spring-like plant structure used by vines to grasp and climb

**Terminal:** Occurring at the tip of the plant stem or twig

**Vegetative reproduction:** Any reproduction of a plant that does not directly result from seed germination, such as cloning or sprouting from stumps, rhizomes, leaves or twigs

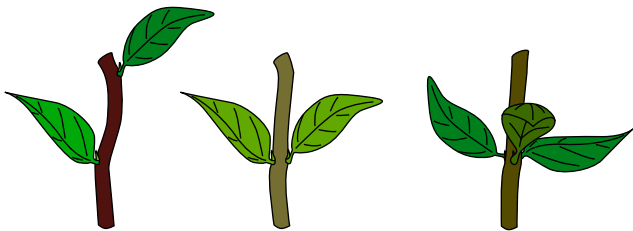
**Wavy margin:** The leaf edge has shallow indentations along the whole length of the leaf edge

**Whorled leaves:** Leaves, buds and branches occur in groups of 3 or more around the stem at each node



Characteristics for Identifying Plants

Leaf arrangement \_\_\_\_\_

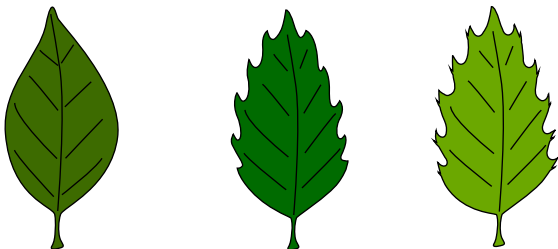


Alternate

Opposite

Whorled

Leaf margin \_\_\_\_\_



Entire

Serrate (toothed)

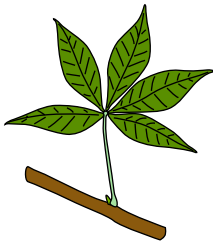
Doubly Serrate

Leaf structure \_\_\_\_\_

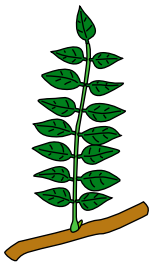
Note: All four illustrations display a single leaf



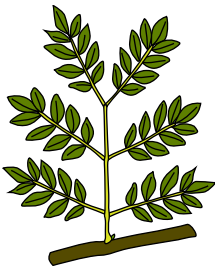
Simple



Palmately Compound



Pinnately Compound



Twice Pinnately Compound

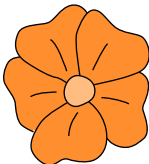


Wavy

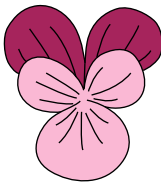


Lobed

Flower \_\_\_\_\_



Regular flower



Irregular flower

Notes

Handwriting practice lines on page 86.

Notes

Handwriting practice lines on page 87.

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## About the Pittsburgh Parks Conservancy

Improving quality of life for the people of Pittsburgh by restoring the park system to excellence in partnership with government and the community. Projects and programs are conducted with respect for the environment, historic design, and the needs of our diverse region.

For more information, visit  
**[www.pittsburghparks.org](http://www.pittsburghparks.org)**



2000 Technology Drive, Suite 200

Pittsburgh, PA 15219

412-682-7275

**[www.pittsburghparks.org](http://www.pittsburghparks.org)**