

It's an Invasion!

This game is a fun way for kids to start to think and learn about how invasive species can crowd out native species and damage their new environments. The activity works best if you have a fairly large group.

BACKGROUND BASICS:

Scientists call animals that are unwanted and out of their natural habitat "pests," while plants that are out of place are called "weeds." Invasive species are plants and animals that are worse than native pests or weeds because they have traveled, or been moved, to new places that are so far out of their native habitat that they have no predators. (That is, nothing in their new homes keeps their population under control by eating them.) The "Invasive Species Cards" handout lists several invasive species along with information about where they came from, how they arrived in Michigan or the Great Lakes and why they're a problem.

For the sake of simplicity, this game doesn't match an invasive species to the native species it threatens. The game is designed to demonstrate how an invasive species can throw a natural environment out of whack, and to encourage kids to start thinking about the relationships between native and invasive species.

PROCEDURE:

Before the meeting:

Make and cut apart enough copies of the Native Species Cards that each player can have one, with all native species having one

duplicate (for matching). Depending on the size of your group, make one or more Invasive Species Cards. If you do hand out more than one invasive Species Card, no two players should receive the same card.

During the meeting:

I. Have the kids sit or stand in a circle where they can hear you. Read aloud or paraphrase to the group the following information.

Today we're going to play a game called "It's an Invasion!" It's a matching game in which most of you will be trying to match pairs of Native Species Cards while one player — the "invader" with an Invasive Species Card — is trying to break up and crowd out the native species. In a few minutes I'm going to give each of you one Native Species Card. There are an even number of each card, and your job will be to find one person whose card matches yours. When I give you the signal, I want you to "shuffle the cards," that is, move around the room/play space without letting anyone else see your card. When you're well-shuffled, I'll tell you to freeze. Then when I give you the next signal, you'll have to move around and find a match for your card **without talking.** When you've found one person whose Native Species Card matches yours, the two of you must sit down.

The complication is that while you're trying to find a match for your card, an invasion will be underway! One of you has an Invasive Species Card, and that person will be moving in, trying to muscle his or her way into your habitat, and perhaps disrupt (mess up) your food chain!

If the invader approaches you before you've met your native species partner, he or she will show you the Invasive Species Card, and you'll have to sit down without making a match. The invader can then move on to do the same thing to other native species cardholders. When all of the species are matched or have been crowded out by the invader, the game is over. Remember, no talking!

OBJECTIVES:

The participants will begin to understand the effects invasive species can have on native species and the environments into which they have moved.

LEARNING & LIFE SKILLS:

- Observing
- Thinking
- Problem-solving
- Communicating
- Cooperating

MATERIALS:

- Index or card stock
- _Native Species Cards (one per person)
- _Invasive Species Card (one or more, depending on the size of your group)

AGE:

6 and up

SETTING:

Indoors or outdoors, with room to move around

TIME:

10-30 minutes

It's an Invasion! Cont'd



- 2. Now give each player a Native Species Card. Be sure to hand out an even number of copies of each card. Secretly give one player an Invasive Species Card (there should be no matches for this card). Depending on the size of your group, you may want to give out more than one Invasive Species Card.
- 3. Remind the kids not to show their cards while they're "shuffling the cards" around the room and that there's no talking while they're playing the game. Give them a signal to begin play. As they move around the room, you may need to remind the kids to sit down if they've been "crowded out" by the person who has the Invasive Species Card.
- 4. The game is over when all of the Native Species Card pairs have been matched or crowded out by the holder of the Invasive Species Card.
- 5. If the kids are having fun with the game and you have time, you may want to collect the cards at the end of the round and repeat the process, making sure that a new person holds the Invasive Species Card in each round.
- 6. After the group is done playing the game, have them return to a circle and sit with their native species partner from the final round they played. Ask for volunteers to share information about their native species, including where it is found in Michigan or the Great Lakes and what species it is being threatened by. Next ask the player or players who held Invasive Species Cards to talk about their species, including what part of the world it is native to, how it arrived in Michigan or the Great Lakes, and why it's a problem in its new environment.

TALKING IT OVER:

Now ask the group the following questions:

- Do you think it was easier to be a player with a Native Species Card or an Invasive Species Card? Why?
- What do you think would happen if there were more players with Invasive Species Cards in the game?
- What happens when real native species are crowded out of their habitat by invasive species?
- Can you name one species we haven't talked about that has invaded Michigan or the Great Lakes and what affect its presence has had on its new habitat? (For example, the emerald ash borer has invaded southeastern and central Michigan and killed millions of ash trees. The invasion of the zebra mussel in the Great Lakes has forced utilities such as water departments to spend millions of dollars to scrape the mussels of off water intake pipes.)

Notes from ISN:

- When printing the cards, note that we've had some issues with the front and back alignment of the cards, depending on the printer. Be sure to do a test print before printing *en masse*.
- The MSU curriculum is an excellent starting point. We've had luck with the following adaptations.
 - Run through the game three times. The first time, do not introduce any invasive species. This allows you to develop a baseline for how the game models a

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It's an Invasion! Cont'd

- healthy ecosystem. Then, introduce one species for the second round, and, for the third round, several species (depending on the group's size). This allows the group to observe the impacts of multiple species in an ecosystem.
- O Since the game cards indicate habitat, you may set rules such that the invasive plant may only replace plants that occupy the same habitat space. (suggested by a teacher, but not yet attempted)
- Varying the "difficulty" by the age group is very do-able. For example, early elementary students might simply run the game, learn about their species, and talk about whether it was easy or difficult to find their match, etc. Older students might benefit from deeper questions about habitat, resource competition, and invasive species life history.
- Without structure, the invasive student may run at the other students. Setting rules like "plants don't run" will help. Model procedure for sharing cards ("I, 2, 3, reveal") will keep things orderly.
- Give students a goal when viewing the native plants during the first round without invasives. Consider having the students select one plant to research afterwards.
 Examples:
 - Write down all plants that occupy the same habitat space as your plant.
 - O Which plant is your favorite, and why?

This game was adapted by the Northwest Michigan Invasive Species Network from the game created by the Michigan State University Extension.

To learn more about the Northwest Michigan Invasive Species Network, including more educational resources, visit www.HabitatMatters.org

INVASIVE PLANT!!



GARLIC MUSTARD
Habitat: Forests

INVASIVE PLANT!!



PHRAGMITES
Habitat: Wetlands

INVASIVE PLANT!!



GLOSSY BUCKTHORN
Habitat: Wetlands

INVASIVE PLANT!!



BABY'S BREATH
Habitat: Dunes

Invasive Plant

phragmites

Phragmites australis

Habitat: Wetlands and shorelines

How it arrived:

Found worldwide. Aggressive colonies are thought to be the result of genetic crossing between native and more invasive European varieties.

Why it's a problem:

Very aggressive and creates tall dense, impenetrable strands that crowd out native species. Phragmites can grow up to 15 feet high and the stems are very tough.

Identification:

There is a native species of Phragmites that looks very similar. Generally, the invasive has darker hue on the stem, grows taller, and the inflorescence grows more densely.

Invasive Plant

garlic mustard Alliaria petiolata

Habitat: Woods (upland and lowland forests)

How it arrived:

From European settlers, likely for food or medicinal purposes.

Why it's a problem:

Aggressively monopolizes light, soil, nutrients, and space from other plants. Each plant can produce up to 3,000 seeds and seeds can remain viable for up to 11 years.

Identification:

Is a biennial plant that grows up to 3 ft tall, and has heart-shaped, toothed leaves that smell like garlic when crushed. The white flowers have 4 petals and form narrow "siliques". There are many native plants that look similar, especially in the early spring, so positive identification is important.

Invasive Plant

baby's breath

Gypsophila paniculata

Habitat: Sand dunes, beaches, roadsides, fields and dirches

How it arrived:

From Europe and Asia, 1800s. Introduced purposefully as an ornamental.

Why it's a problem:

Very aggressive plant that produces a prolific amount of seeds and has a deep taproot. It crowds out native dune plants, including state and federally threatened Pitcher's thistle (*Cirsium pitcherii*).

Identification/Look-a-likes:

A perennial plant up to 3 ft in height, with simple opposite narrow leaves with a large tap-root. Produces many small white flowers (June-August) that are used in floral arrangements.

Looks like the invasive bladder campion (*Silene vulgaris*), and can be distinguished when flowering occurs.

Invasive Plant

glossy buckthorn

Frangula alnus

Habitat: Wetlands

How it arrived:

Mid 1800s from Europe, introduce purposefully as an ornamental plant

Why it's a problem:

Rapidly forms dense thickets that crowd out native shrubs and wildflowers. Does not provide good food source for wildlife and degrades the soil quality and is difficult to eradicate.

Identification/Look a likes:

Tall shrub, simple dark leaves with alternate branching. Has small greenish-yellow flowers, 4 petals, clusters of 2. The small red seeds ripen to black.

Native alder (R. alnifolia) is shorter (up to 3ft tall) and Lance-leafed buckthorn (R. lancelota) is up to 6ft tall with narrow leaves 2-6 inches long. look similar.

INVASIVE PLANT!!

INVASIVE PLANT!!



AUTUMN OLIVE
Habitat: forests, fields, dunes, meadows



PURPLE LOOSESTRIFE
Habitat: wetlands

INVASIVE PLANT!!

INVASIVE PLANT!!



JAPANESE KNOTWEED

Habitat: wetlands, stream banks, forest edges



SPOTTED KNAPWEEDHabitat: Dunes, fields, meadows

Invasive Plant

purple loosestrife

Lythrum salicaria

Habitat: wetlands

How it arrived: Introduced in the 1800s, for ornamental and medicinal purposes.

Why it's a problem:

Flowers from June through September, producing vast quantity of seeds (two to three million per plant). Also spreads vegetatively. Now banned for sale in MI. Biological control being attempted, through release of loosestrife beetle.

Identification:

Grows up to six feet tall. It has square stems, and it's long narrow leaves grow opposite each other. Grows in wetlands and prefers full sun, though it can tolerate some shade.

Invasive Plant

autumn olive Typha angustifolia

Habitat: forests, fields, dunes, meadows

How it arrived: Introduced in the 1800s, planted widely for mine reclamation, shelterbelts, and erosion control. Mistakenly planted for wildlife habitat

Why it's a problem: Invades disturbed areas, outcompetes native species to form a dense shrub layer, displacing native species.

Identification: Grows up to 20ft high and 30ft wide. Simple, alternate, oval leaves about 2-4 inches long, smooth edged, with a silvery speckled underside. Often thorny. Flowers are fragrant cream to light yellow, blooming April to June. Red fruits are edible.

Invasive Plant

spotted knapweed

Centaurea biebersteinii

Habitat: Dunes, Fields, Open areas

How it arrived: Accidentally through contaminated forage in the late 1800s from Europe.

Why it's a problem:

Produces a large number of seeds (40,000) that can remain in the soil for up to 7 years. Although pollinated by some insects, no wildlife or insect larvae can eat the plant which allows it to outcompete native plants. It also emits chemicals into the ground that kill surrounding plants and creates poor soils.

Identification:

2-4 ft. tall, all leaves are pale of gray-green with rough, fine hairs. Has many fringed solitary pink-purple flowers.

Invasive Plant

Japanese knotweed Polygonum cuspidatum

Habitat: wetlands, stream banks, forest edges

How it arrived:

Introduced in 1800s as an ornamental.

Why it's a problem:

Forms dense thickets which shade out natives. Rhizomes can damage pavement. Hard to remove.

Identification/look a likes:

Grows up to 10 ft, Large, alternate leaves up to six inches long and five inches wide, Grows numerous small white flowers and a stalk

Now prohibited for sale and planting under Michigan law.

NATIVE PLANT

GREAT BLUE LOBELIA

SHOWY LADYSLIPPER



HABITAT: wetlands



HABITAT: wetlands

NATIVE PLANT

NATIVE PLANT

PITCHER'S THISTLE

WINDFLOWER OR THIMBLEWEED



HABITAT: dunes



HABITAT: dunes

Native Plant

showy ladyslipper (Cypripedium reginae)

Native plant of wetlands Facts:

- Most commonly pollinated by bees
- Leaves can cause a skin reaction in some
- Largely on decline from overcollection, deer, habitat loss, and invasive species

Invasive plant competitors:

- phragmites
- narrow-leaved cattail
- glossy buckthorn

Remember...Please do not pick native wildflowers! Some are protected by state and federal laws.

Native Plant

great blue lobelia (Lobelia siphilitica)

Native plant of wetlands Facts:

- Plants was once used to treat respiratory illnesses
- Plant has been used as a love charm
- Pollinated primarily by bees in the Bombus genus (bumble bees)

Invasive plant competitors:

- phragmites
- narrow-leaved cattail
- glossy buckthorn

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Native Plant

windflower or thimbleweed (Anemone spp.)

Native plant of dunes Facts:

- Commonly pollinated by bumble bees
- Is in the buttercup family

Invasive plant competitors:

- baby's breath
- spotted knapweed

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Native Plant

pitcher's thistle (Cirsium pitcheri)

Native plant of dunes Facts:

- Is only found in the Great Lakes shoreline.
- Over 30 insects pollinate the plant, most commonly bees
- Listed as state and federally threatened in 1988
- Larval host to the painted lady and gray hairstreak butterflies.

Invasive plant competitors:

- ♦ baby's breath
- spotted knapweed
- blue lyme grass

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NATIVE PLANT

DEATH CAMAS

YELLOW LADYSLIPPER



HABITAT: dunes



HABITAT: dunes

NATIVE PLANT

TROUT LILY

NATIVE PLANT

YELLOW VIOLET



HABITAT: forest



HABITAT: forest

Native Plant

yellow ladyslipper (Cypripedium calceolus)

Native plant of dunes Facts:

- Pollinated by small insects, often the Adrenid bee
- ♦ Has preference for limestone-rich soils
- Roots have been used to treat anxiety and restlessness

Invasive plant competitors:

- ♦ baby's breath
- spotted knapweed
- blue lyme grass

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Native Plant

death camas (Zigadenus venenosus)

Native plant of dunes Facts:

- Very poisonous, yet looks similar to the edible leek
- Dried plant may poisonous for up to 20 years
- In the same family as onion, garlic, and asparagus

Invasive plant competitors:

- ♦ baby's breath
- spotted knapweed
- blue lyme grass

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Native Plant

yellow violet (Viola pubescens)

Native plant of forests Facts:

- Pollinated by the Giant Leopard Moth and many butterflies
- Larval host to bog, meadow, and silver-bordered fritillary

Invasive plant competitors:

• garlic mustard

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Native Plant

trout lily (Erythronium americanum)

Native plant of forests Facts:

- A characteristic spring ephemeral plant of woodlands
- The name is derived from the resemblance of its mottled leaves to the coloring on brook trout.
- The plants form vast colonies and are thought to be as old as the trees, sometimes up to 300 years old!

Invasive plant competitors:

garlic mustard

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NATIVE PLANT

HOARY PUCCOON

DUNE MARRAM GRASS



HABITAT: dunes

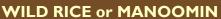


HABITAT: dunes

NATIVE PLANT

NATIVE PLANT

EARLY MEADOWRUE





HABITAT: forest



HABITAT: wetland

Native Plant

dune marram grass (Ammophila breviligulata)

Native plant of dunes

Facts:

- A characteristically hardy plant of coastal sand dunes
- Is pollinated by wind
- Slows erosion

Invasive plant competitors:

- baby's breath
- spotted knapweed
- ♦ blue lyme grass

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Native Plant

hoary puccoon (Lithospermum canescens)

Native plant of dunes Facts:

- Grows only in dune ecosystems
- Flowers attract the giant bee fly, duskywings, and common sootywing.

Invasive plant competitors:

- ♦ baby's breath
- spotted knapweed
- blue lyme grass

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Native Plant

wild rice or manoomin (Zizania spp.)

Native grass of wetlands Facts:

- Has significant Native American cultural significance and is high in nutritional value.
- Many species of wildlife consume the seeds, and use the plant as habitat.
- Larval host to broad-winged skipper
- Southern wild-rice (Zizania aquatica var. aquatica) is a state threatened plant.

Invasive plant competitors:

- phragmites
- glossy buckthorn
- narrow-leaved cattail

Native Plant

early meadowrue (Thalictrum dioicum)

Native plant of forests Facts:

- Attracts many pollinators, namely bees and butterflies
- Is in the Buttercup family

Invasive plant competitors:

• garlic mustard

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wild swamp rose (Rosa palustris)



Habitat: wetlands

NATIVE PLANT

small purple fringed orchid (Platanthera grandiflora)



Habitat: wetlands

NATIVE PLANT

cinnamon fern (Osmunda cinnamomea)



Habitat: wetlands

NATIVE PLANT

nodding trillium (Trillium cernuum)



Habitat: wetlands

NATIVE PLANT

indian pipe (Monotropa uniflora)



Habitat: forests

cinnamon fern

Native plant of wet woods

Facts:

- Fiddleheads of the fern are eaten by ruffed grouse, white-tailed deer, etc
- Tend to grow under red maple, white pine, and white oak

Invasive Plant Competitors:

♦ garlic mustard

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nodding trillium

Native plant of forests

Facts:

- After the flower blossoms, the petals turn from white to pink
- Picking the leaves/flowers destroys the plant
- Pollinated by Eastern pine elfin and Eastern tailedblue butterflies

Invasive plant competitors:

• garlic mustard

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indian pipe

Native plant of forests

Facts:

 A unique plant that lacks chlorophyll because it obtains its nutrients from the roots of pines, oaks, beeches, and hemlocks

Invasive plant competitors:

♦ garlic mustard

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common milkweed

Native plant of open fields and dunes Facts:

- Many species, like the Monarch butterfly, solely depend on milkweed plants
- Plant is poisonous, which give the monarch poisonous coloration that deters predators.
- Pollinated by the acadian hairstreak butterfly

Invasive Plant Competitors:

- baby's breath
- spotted knapweed
- blue lyme grass

Remember...Please do not pick native wildflowers! Some are protected by state and federal laws.

wild swamp rose

Native plant of wetlands

Facts:

- ♦ Rose hips (fruits) are a good source of vitamin C
- Larval host to the mourning cloak butterfly
- Pollinated by the Baltimore checkerspot butterfly

Invasive plant competitors:

- phragmites
- narrow-leaved cattail
- glossy buckthorn

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Small Purple Fringed Orchid

Native plant of wetlands

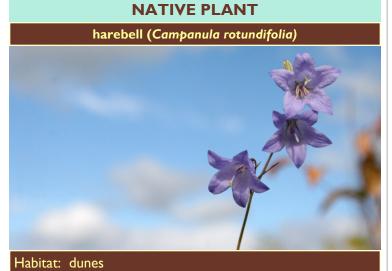
Facts:

- Declined populations from over-picking, grazing by deer, and over collection
- Attracts large butterflies and sphinx moths
- Pollinated by tawny-edged skipper, purplish copper butterflies

Invasive plant competitors:

- phragmites
- narrow-leaved cattail
- glossy buckthorn

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blue vervain (Verbena hastate)



Habitat: wetlands

NATIVE PLANT

blue flag iris (Iris versicolor)



Habitat: wetlands

NATIVE PLANT

black eyed susan (Rudbeckia hirta)



Habitat: dunes

NATIVE PLANT

turtlehead (Chelone glabra)



Habitat: wetlands

NATIVE PLANT

bog laurel (Kalmia polifolia)



Habitat: wetlands

black eyed susan Native to dunes

Facts:

- Very competitive pioneer plants
- Often seen with the goldenrod, common milkweed, and the red maple
- Larval host to gorgone checkerspot
- Pollinated by many bees and butterflies

Invasive Plant Competitors:

- baby's breath
- spotted knapweed

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turtlehead

Native plant of wetlands

Facts:

- Attractive to butterflies, like peck's skipper and dun skipper
- Larval host to the Baltimore checkerspot butterfly
- Often used in gardens
- Name for similarity of flowers to a turtle's head

Invasive plant competitors:

- phragmites
- narrow-leaved cattail
- ♦ glossy buckthorn

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bog laurel

Native plant of wetlands

Facts:

- All parts of plant are poisonous
- ♦ Highly pollinated by bees
- Often associated with tamaracks, black spruce, and the purple pitcher plant
- Larval host to frigga fritillary butterfly

Invasive plant competitors:

- phragmites
- narrow-leaved Cattail
- glossy buckthorn

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harebell

Native to dunes

Facts:

- Many species, like the monarch butterfly, solely depend on the milkweed
- Plant is poisonous, which makes the monarch poisonous

Invasive Plant Competitors:

- ♦ baby's breath
- spotted knapweed
- blue lyme grass

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blue vervain

Native plant of wetlands

Facts:

 Good source of adult nectar, most often for small butterflies and bees

Invasive plant competitors:

- phragmites
- narrow-leaved cattail
- glossy buckthorn

Remember...Please do not pick native wildflowers! Some are protected by state and federal laws.

blue flag iris

Native plant of wetlands

Facts:

- Used widely in gardens
- ♦ Has been used to treat earaches and sore eyes
- Pollinated by larger butterflies: viceroy, great spangled fritillary

Invasive plant competitors:

- phragmites
- narrow-leaved Cattail
- ♦ glossy buckthorn

Remember...Please do not pick native wildflowers! Some are protected by state and federal laws.

wild strawberry (Fragaria virginiana)



Habitat: dunes

NATIVE PLANT

cut-leaved toothwort (Cardamine concatenate)



Habitat: forest

NATIVE PLANT

wild ginger (Asarum canadense)



Habitat: forest

NATIVE PLANT

michigan lily (Lilium michiganese)



Habitat: wetlands

NATIVE PLANT

bloodroot (Sanguinaria canadensis)



Habitat: forest

NATIVE PLANT

white water lily (Nymphaea odorata)



Habitat: wetlands

Michigan lily

Native to wetlands

Facts:

- Often cultivated for gardens
- Deer are known to eat mature plants
- Attracts Hummingbirds and larger insects such as the following butterflies: gray comma, Atlantis fritillary, and viceroy.

Invasive Plant Competitors:

- phragmites
- glossy buckthorn
- narrow-leaved cattail

Remember...Please do not pick native wildflowers! Some are protected by state and federal laws...

Wild strawberry

Native to dunes

Facts:

- Berries are often eaten by deer, squirrels, birds, etc
- Leaves can be dried and steeped for tea
- Pollinated by the orangetip butterfly

Invasive Plant Competitors:

- baby's breath
- spotted knapweed
- blue lyme grass

bloodroot

Native to forests

Facts:

- One of the first flowers to bloom in spring
- Juice from roots was once used as dye
- Plant cells can be toxic to skin
- Pollinated by ground pollinators, like ants

Invasive plant competitors:

• garlic mustard

Remember...Please do not pick native wildflowers! Some are protected by state and federal laws.

cut leaved toothwort

Native to forests

Facts:

- One of the first flowers to bloom in the spring
- Roots and leaves are said to be tasty when boiled
- Thought to be used to treat toothaches
- Larval host to west virginia white and the mustard white butterflies

Invasive plant competitors:

garlic mustard

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white water lily

Native plant of wetlands

Facts:

- Leaves are roots are eaten by beavers and muskrats
- Roots and leaves have been used to heal colds
- Very popular in aquatic gardens
- Pollinated by generalist beetles and small flies

Invasive Plant Competitors:

- baby's breath
- spotted knapweed
- blue lyme grass

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wild ginger

Native to forests

Facts:

- Pollinated by ground-loving insects, like ants.
- Roots are edible; can be used as a replacement for culinary ginger
- Can be used to treat headaches and digestive problems

Invasive plant competitors:

• garlic mustard

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