

Plotting Plants

Method

Students will map the invasive species present in an area on their school grounds, school forest, or nearby natural area. Older students may standardize and digitize the information for inclusion in a long-term monitoring database.

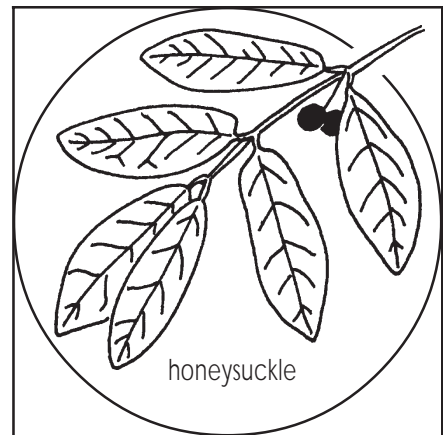
Getting Ready

1. Decide how far you want to take this activity! You and your students can:
 - Step out the back door of your school armed with site plans or plat maps of your neighborhood. Students can plot the locations of invasive plants and make notes about their abundance and distribution.
 - Define a natural area or section of your school forest or nearby park to map. Students can plot the locations of invasives on a topographic map or aerial photo. They can use the attached forms to gather information about the plants.
 - Begin a major monitoring project to track the changes and effects of invasive species in a defined area. Students can use GPS units and mapping tools to create maps. They can use the attached forms to gather baseline data. Each year students can add to the collected data. Over time, they can graph changes in distribution and density of invasive plants in the area being studied.
2. Locate a study area and obtain permission to take your students there.
3. Gather equipment, maps, and books needed to conduct the activity.

Introducing the Activity

Monitoring is an essential part of any invasive plant control project. In addition, monitoring allows you and your students to:

- Be involved in *real* science.
- Collect valuable information on specific species and communities over time.
- Perceive subtle changes in habitats that might not be noticed without consistent data collection.
- Detect the presence of new species (including new invasive species) in an area.
- Evaluate the success or failure of control measures.
- Measure the changes in plant diversity before, during, and after invasive species control.



Objectives

- Collect monitoring information about an invasive species population and location.
- Plot the locations of an invasive species on a map of the area.

Grades

4 – 12

Group Size

Small groups of 3

Activity Time

Varies

Setting

Indoors and outdoors

Materials

- Map of area to be investigated (site plan, topo map, plat map, Gazetteer)
- Access to Internet mapping tools (optional)
- GPS unit (optional)
- Clipboards and pencils
- Copies of *Plotting Plants* data form (pages 96 – 98)
- Plant identification books (See list on page 139.)

Connections

See next page.

Academic Standards

Grade 4

- Science: A.4.3, B.4.1, C.4.3, C.4.4, C.4.5, F.4.3

Grades 5 – 8

- Environmental Education: C.8.2, D.8.6
- Science: B.8.5, C.8.2, C.8.3, C.8.6, C.8.8, F.8.2, F.8.8

Grades 9 – 12

- Environmental Education: D.12.5
- Science: C.12.3

Scout Connections

- Boy Scouts: Surveying
- Cadette and Senior Girl Scouts: Wildlife

Doing the Activity

1. **Discuss the value of mapping invasive plants.**
2. **Introduce the mapping project you have chosen.**
3. **Learn about local invasive plants.** If your students haven't become familiar with local invasives in earlier activities, help them do so now. Encourage each student or small group of students to become the experts on one invasive plant. Students should:
 - Collect descriptions, drawings, and/or photographs of their assigned species.
 - Find out how the plants will look during the time of the survey. For example, will they be in bloom (ideal)? Will they have gone to seed? Will they be dormant? Will they have only a rosette of leaves?
 - Investigate how the invasive plants spread. This will help students locate the plants. For example, if they reproduce by seeds that birds might eat, the plants could be scattered throughout the study area. However, if they reproduce by sending out rhizomes or stolons, the plants are more likely to form discrete clumps. If humans spread them, students might only need to follow the roads and trails to find populations of the plants.
4. **Decide on your protocol.** Discuss how you will record and track the information you gather. This can be as simple as choosing map symbols for each invasive plant. However, with older students you may need to make decisions about how to standardize information so it can be entered in a database. A datasheet is included in this lesson plan. Notice that, in each section, basic information is collected first, followed by information that is more specific. You can cut and paste sections together to create a form that is appropriate for your students.
5. **Collect data.** On the day of the field experience, be sure students understand these guidelines:
 - Students are responsible for staying inside the established boundaries.
 - Students will turn in completed datasheets at the end of the field experience.
 - Students will respect each other and the area they are investigating.
6. **Leave the area.** Before you leave one area or move to a new area, clean off your shoes and remove any plant parts that may be attached to your clothes. This will help prevent invasive species from spreading to new sites.

7. **Compile data.** Back in the classroom, organize your data. Your students could:
 - Plot all the occurrences of invasive plants on a large map of the school or neighborhood. Use symbols to represent each different plant. Post the map in a community center along with pressed specimens or drawings. Be sure students include information about what invasive plants are and why they are a problem.
 - Use DNR WebView to plot their GPS data on a map. See *Finding Out More!* below.
 - Compile data in a spreadsheet. Calculate the top five invasives in the area. Are the invasive plants concentrated in a small area or are they evenly distributed around the entire study area? Can students make any generalizations about the ways invasives might be spreading?
8. **Share your findings.** Send completed data sheets, maps, specimens, and/or photos to the address on the data sheets. If your students conducted the survey in a city, county, or state park, encourage them to offer their data to the managers of the property. If they found invasive plants *new* to Wisconsin, visit the Invasive Plants Prevention and Reporting Project Web site. See *Finding Out More!* below. If your students submit the first record of a plant from their county, their names and records will be displayed on the Wisconsin State Herbarium Web site.

Assessing the Learning

Plant information collected by the student should include a written description, a drawing or photograph of the plant, notes on phenology of the plant, and information on the way the plant spreads. All datasheets should be complete and legible. Locations should be plotted on maps as accurately as possible, taking in account the age of the students.

Finding Out More!

Invasive Plants Prevention and Reporting Project. Wisconsin Department of Natural Resources. 2005. <www.dnr.wi.gov/invasives/futureplants>

DNR WebView. Wisconsin Department of Natural Resources. 2005. An online interactive map viewer. Find digital aerial photos, topographic maps, and GIS data for your school forest, community, county, or the whole state! <<http://maps.dnr.state.wi.us/webview/>>

The Global Invasive Species Initiative. The Nature Conservancy. 2005. The Weed Information Management System (WIMS) is a free Microsoft Access-based relational database application that is designed to assist natural resource managers in managing their weed data. Definitely for the serious weed watcher! <<http://tncweeds.ucdavis.edu/wims.html>>

Plotting Plants

Location #

Fill in this information for each location that you map. On your map, mark the place where you are and record the location number. Include this same number on each invasive plant form you complete for this location.

Survey date (dd/month/yyyy): _____

Names of observers: _____

Location Information

Name of the location: _____

State: _____

County: _____

Township: _____

Nearest city/town: _____

Describe the location: (highway/road, distance and direction to nearest town, crossroads or topo map reference point):

Who owns the land? (state, county, city, school, individual) _____

Detailed Location Information (choose one of the following 3 methods)

1. Public Land Survey System

Township: T _____ N

Range: R _____ E / W (circle one)

Section: _____

Quarter: _____

Quarter Quarter: _____

2. Latitude/Longitude Coordinates

Latitude: _____ N

Longitude: _____ W

3. Universal Transverse Mercator

Zone 15 Zone 16

_____ E

_____ N

How did you determine the location? Check most accurate method you used.

- Topo map (15 minute) Source _____ Scale _____ Date _____
- GPS unit (Circle precision: 0-5, 0-30, 0-100, 0-1000, 1000+)
- Plat map
- Aerial photo
- DNR WebView
- TopoZone or other website
- Gazetteer
- Other _____

Habitat Description

Location #

Check the habitat type that best describes the area.

- | | |
|------------------------------------|--------------------------------------|
| <input type="checkbox"/> Woodland | <input type="checkbox"/> Aquatic |
| <input type="checkbox"/> Grassland | <input type="checkbox"/> Urban |
| <input type="checkbox"/> Wetland | <input type="checkbox"/> Other _____ |

Describe the habitat:

Detailed Habitat Description

How is the land being used? (road, trail, agricultural, residential, natural plant community, wild area, park, etc.):

Do you see evidence of disturbance? Check all that apply.

- | | |
|--|---|
| <input type="checkbox"/> Animal use (buck rubs, burrow excavation) | <input type="checkbox"/> Mining (rock quarry, gravel pit) |
| <input type="checkbox"/> Construction | <input type="checkbox"/> Mowing |
| <input type="checkbox"/> Cultivation | <input type="checkbox"/> ORV use |
| <input type="checkbox"/> Erosion | <input type="checkbox"/> Railroads |
| <input type="checkbox"/> Fire | <input type="checkbox"/> Recreation |
| <input type="checkbox"/> Flood | <input type="checkbox"/> Residential use |
| <input type="checkbox"/> Grazing | <input type="checkbox"/> Roads |
| <input type="checkbox"/> Logging | <input type="checkbox"/> Other _____ |

How much disturbance is there? _____

Are there other significant species? List other non-native or invasive species present or rare plants at risk from the infestation.

Plant Information

Location #

Fill in this information each time you find an invasive plant population. Connect the information to your map by matching it to a location number.

Scientific name: _____

Common name: _____

What parts of the plant's life cycle do you see? Check all that apply.

- | | |
|---|--|
| <input type="checkbox"/> Seedlings | <input type="checkbox"/> Fruits |
| <input type="checkbox"/> Rosettes of leaves | <input type="checkbox"/> Seeds |
| <input type="checkbox"/> Buds | <input type="checkbox"/> Seeds dispersed |
| <input type="checkbox"/> Flowers | <input type="checkbox"/> Dead plants |

How many plants are there? Circle one.

(1 = a few plants or small area; 5 = many plants or complete coverage)

1 2 3 4 5

Total number of plants/shoots: _____

Detailed Plant Population Information

Estimated total area of infestation (m² or ha; one hectare = 100 m x 100 m): _____

Do you see reproduction?

- Yes
 No

If seedlings are present; how common are they?

- Few
 Common
 Abundant

How are the plants distributed?

- | | |
|--------------------------------------|--------------------------------------|
| <input type="checkbox"/> Isolated | <input type="checkbox"/> Satellite |
| <input type="checkbox"/> Linear | <input type="checkbox"/> Uniform |
| <input type="checkbox"/> Monoculture | <input type="checkbox"/> Other _____ |

Documentation

Specimen collected. Where sent? _____ Date sent ____/____/____

Photographs taken. Where sent? _____ Date sent ____/____/____

Send this completed form to: Wisconsin Department of Natural Resources ER-6, 101 S. Webster St. Madison, WI 53707-7921. Include a plant specimen and/or photo if possible.