Lesson 5: Outdoor Research to Inventory Invasive Plants in Study Site

Overview

If your class has chosen to focus on the GLRI focus area of preventing and controlling invasive species, this lesson would be a good option for getting outdoors and doing field work. The activities included will encourage student groups to become experts in identifying a certain species of invasive plant and will give them an opportunity to apply their knowledge and attempt to identify those invasive plants outdoors at a chosen study site.

Curriculum Connections

Michigan K-12 Science Standards

- Ecosystems: Interactions, Energy, and Dynamics
  - MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
- Biological Evolution: Unity and Diversity
  - HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.
- Earth and Human Activity
  - 5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
  - MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

Great Lakes Literacy Principle(s)

#5 - The Great Lakes support a broad diversity of life and ecosystems.

Focus Areas of GLRI Action Plan

- Preventing and controlling invasive species

Key Questions

- What are the identifiable characteristics of local invasive plants?
- Are there invasive plants in our study site?

Student Objectives

- Students will conduct online research to create an identification tool for local invasive plants.
- Students will present their findings to their class and, ideally, to a community expert who is knowledgeable about plants.
- Students will use the identification tool they have created to identify and tag invasive plants in their study site.

Vocabulary

Invasive Species
Distribution

Materials List and Setup

- Student technology with internet to research invasive plant characteristics
  - A list of botany websites and resources for plant identification can be found at the end of the lesson plan in Supplementary Materials.

- Technology to present student slideshows
- Flagging tape or pin flags (available at your local hardware store)

Program Activities

1. Engage:
    a. Procedure:
        i. Reach out to a local plant expert in your area who is familiar with invasive species. Ask them what invasive plants are troublesome in your study site (school yard, park, field). If you do not have a study site with invasive plants identified, you can ask them to recommend a spot near your school known to have several types of invasive plants.
        ii. Split students into groups based on the numbers of invasive plant species at the study site.
2. Explore:
    a. Materials:
        i. Student technology with internet to research invasive plant characteristics
            1. A list of botany websites and resources for plant identification can be found at the end of the lesson plan in Supplementary Materials.
    b. Procedure:
        i. Students will use technology to locate information and identifying characteristics of their assigned invasive plant. Helpful websites are listed in the Supplementary Materials section at the end of this lesson plan.
        ii. Students should develop a slideshow with the following information:
            1. Slide 1: Common Name and Scientific Name
            2. Slide 2: The top 3 unique, identifying characteristics (use photos to demonstrate)
            3. Slide 3: Seasonal pictures of your plant (fall, winter, summer, and spring)
            4. Slide 4: Distribution map of where it is found in the United States
            5. Slide 5: What are the harmful effects of this plant?
3. Explain:
    a. Materials:
        i. Projector to present student slideshows
    b. Procedures:
        i. Student groups will present their slideshow to the class. If there is a knowledgeable community partner available, invite them to your classroom for student presentations of their identification guides. The community expert can give feedback and offer advice on identification for when students head out to the field.
4. Elaborate/Extend:
    a. Materials:
        i. Flagging tape or pin flags (available at your local hardware store)
        ii. Student-created identification guides printed out (1 per student group)
    b. Procedure:
        i. Print out class-created invasive plant identification guides that include all of the plants the class researched.
        ii. At the study site, direct student groups to use the identification guides to locate and mark (with flagging tape or pin flags) any invasive plants they find.
5. Evaluate:
    a. If there is a community partner available to come to your study site, they can provide an authentic evaluation of student learning by confirming correct identification and ideally helping the class report their findings to the appropriate agency to come remove/treat the invasive plants.

Supplementary Materials
Borland, K., Campbell, S., Schillo, R. & Higman, P. (2009). *A Field Identification Guide to Invasive Plants in Michigan's Natural Communities.* Retrieved from https://mnfi.anr.msu.edu/invasive-species/InvasivePlantsFieldGuide.pdf Michigan Natural Features Inventory *Best Control Practice Guides* http://mnfi.anr.msu.edu/invasive-species/best-control-practice-guides.cfm Midwest Invasive Plant Network *Plant Identification traits, photos, distribution maps* https://www.mipn.org/plantlist/ Midwest Invasive Species Information Network *Invasive Species Fact Sheets* http://www.misin.msu.edu/facts/ *Report Occurrences* - Students can contribute their data to the map about where they found certain invasive species. http://www.misin.msu.edu/report/ National Invasive Species Information Center *Invasive Plants information, tells history and method of invasion into U.S.* https://www.invasivespeciesinfo.gov/plants/main.shtml University of Michigan Herbarium https://michiganflora.net/