LESSON 32

Weed Detectives: Surveying for Invasive Plants

Grade level: 9-12
Subject Areas: Biology
Duration: 3 class periods plus independent research time
Setting: Classroom and field site
Season: Spring, Summer or Fall
Conceptual Framework Topics: Plant distributions, habitat, invasive species management, mapping and survey techniques

OBJECTIVES

Students will understand how and why areas are surveyed to determine whether invasive plant species are present. They will be able to conduct early detection surveys.

METHOD

Students learn about noxious weed species in their area. They learn how to conduct early detection surveys for those plants. They practice recording data for the surveys on the school grounds before using them in the field to survey for local invasive species.

MATERIALS

- ✎ Maps of area to be surveyed
- ✎ **Invasive Plant Survey Data Form**
- ✎ **Invasive Plant Survey Summary**
- ✎ GPS Units (optional)
- ✎ Photos or guides to weeds (see below)

BACKGROUND

Scientists and land managers often collect data on the location and numbers of plants, including invasive species. There are several methods used to sample plants, and which one is used depends on a number of factors, including what you want to know and how much time you have to collect data. Two methods important in the study and management of invasive plants are surveys to identify where they occur, and sampling to determine how numerous or dense they are.

Surveys for invasive species are aimed at finding species as they invade an area (early detection surveys) or to determine which species occur in a previously unsurveyed area. Because the most effective management of invasive species occurs when species first begin to invade and populations are still small, early detection surveys can be extremely important. These surveys are not designed to determine the population size or density of plants. Such surveys can be completed with fairly minimal time and effort.

In this lesson your students will learn to conduct early detection surveys for invasive noxious weed species. kNOweeds ***Lesson 31: Virtual Survey of Invasive Plants*** will be helpful to prepare students for this lesson.

Houndstongue
Cynoglossum officinale

PROCEDURE

1. Select an appropriate area for your students to "adopt" to learn about and perhaps help manage invasive species (see kNOweeds ***Lesson 46: Invasive Plant Management: Plan to Action***). This could be a local city park, an empty lot, a stream corridor, a nature park or preserve. Contact the appropriate agency or organization to gain permission to conduct your studies and perhaps request advice and information. You may be able to obtain maps from one of these sources.

2. Explain to your students that it is often impossible to check every part of an area for invasive species due to time and resource constraints. Ask how they think they could best determine what invasive species occur in an area such as a park, empty lot, forest, or other site of interest. Discuss the idea of collecting data in a portion of the site to get a suggestion of what the entire area is like.

3. Have your students learn to identify invasive species in your part of Montana. You may want to direct them to the following sites:
http://www.weedawareness.org/weed_id.html
http://mtwow.org/Weed-ID.html
Photos of weed species at the time of year of your survey will help them in the field.

Talk to a local land manager to find out which species you might want to focus on, such as newly invading species or others whose presence in the study area may be unknown. It may not be feasible to try to record all the noxious weed species if your area is heavily invaded.

4. Decide on a survey method (including survey routes, lengths, locations), taking into consideration the type of habitats the species you want to focus on occur in, whether they tend to colonize disturbed sites, etc. Mark the sites you will survey on a map of your study area and give each one an identification number (survey route number). Divide up the survey sites among the students. You will probably want to have them work in small groups or pairs, with each group responsible for a section of trail or roadside or a sub site of the area. Make sure each group has a map of their portion of the study area. You may want to have them sketch a map, roughly to scale, of the survey area on the back of the data sheet.

5. Have your students practice filling out the data forms and mapping locations using plants on the school grounds as substitute (or real!) noxious species. Make sure they understand how to estimate patch size and make accurate locations on a map.

6. Have students walk the survey sites and record data for the species you are focusing on, using their **Invasive Plant Survey Data Form** and their map. If you have GPS units, use them to help map the locations. **Make sure that students fill out a form even if they didn't find any of the species on their survey route.**

7. Emphasize to students the importance of cleaning shoes and clothing of any seeds or other plant parts after completing their surveys.

8. As students complete their surveys, have them fill out their portion of the **Invasive Plant Survey Summary Form** as well as the locations on a map of the entire area. You may want to have a map for each plant species surveyed, or color codes for each species if there aren't very many. Have them number each patch they record (e.g., they could record *Centaurea stoebe* patches as CM1, CM2, etc.).

9. Based on the data your class collected, discuss the condition of the area with regard to invasive plants. Are any species invading? How well established are they? In what kinds of habitats do they occur? Are they widespread or limited to only certain types of habitats? Did they notice any differences in the types or diversity of other plant species where the invasive plants do and don't occur? What kind of management strategy would they suggest for this site? Is there other information they think should be collected?

10. Based on this discussion, have students write a summary of their findings in a report form.

11. Present or send your information to those responsible for managing the area.

Extensions

Have students complete ***Lesson 46: Invasive Plant Management: Plan to Action*** in this guide using the area you surveyed.

Name _____

Invasive Plant Survey Data Form

Study Site: _____

Survey Route Number: _____ Date _____

Surveyed by: _____

Type of habitat surveyed (e.g., wetland, forest, riparian, grassland, roadside, etc.) and brief description:

Fill out a row of the table below for each patch of invasive plants you encounter.

Plant Species	**Estimated size of patch (check one):**				
	$< 1\ m^2$	$1–5\ m^2$	$5–50\ m^2$	$50–100\ m^2$	$> 100\ m^2$

Mark the locations of the invasive plants on your map.

Name _____

Invasive Plant Survey Summary Form

Class: _____ Date: _____

Study Site: _____

Route number	Patch number	Habitat	Plant species	Patch size