

Sample Inventory Protocol

Grade: 9 to 12

Length: variable

Subjects: life science

Topics: inventory

Objectives

Exercises in this lesson help students achieve the following objectives:

- Understand how to conduct weed inventories using a transect line
- Understand the importance of following a protocol

Introduction

Established protocols help ensure that weed managers collect accurate and consistent data when conducting a weed inventory. Students will learn how to follow a protocol properly and collect accurate data by setting up a transect line. This lesson is ideal for students who wish to collect specific weed location information without using a GPS receiver. Before teaching this lesson, read the entire lesson and make sure all materials are available.

To complete this lesson successfully, students must already have the ability to identify noxious weeds in their study area.

If students need more information about inventories, conduct the lesson *The Right Inventory for the Job* before teaching this lesson.

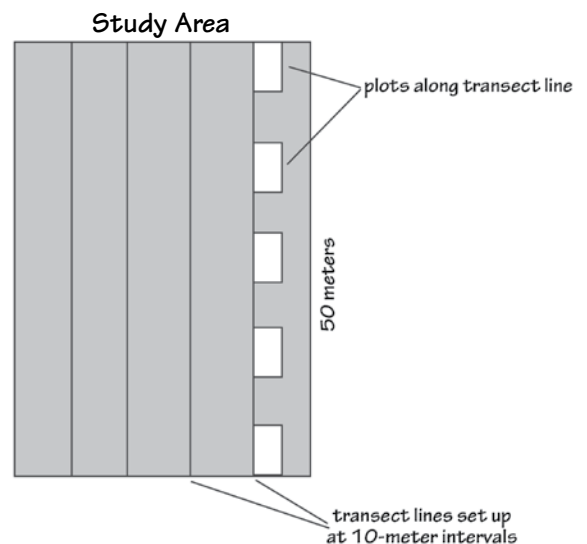
Background

Weed managers need to know the locations of specific weeds, whether the weeds are spreading, and the effectiveness of weed management practices. Inventories help provide this information.

There are different types of inventories. Sometimes, an **inventory** covers a large area in a broad sweep. Other inventories provide detailed information about a small area. Regardless of the type of inventory, it is imperative that information collected during the inventory be accurate and reliable.

To ensure the reliability of information, weed managers follow strict **protocols** or procedures when collecting information during inventories. (For more information about protocols, see the lesson *Practicing Protocols*.) This lesson focuses on the following protocols:

Setting up a transect line - A **transect** line is a straight line laid out randomly or systematically within a study area. One or more transect lines may be set up within a study area. Before setting up a transect line, determine the length of the line. The line length often depends on the size of the study area. Weed managers often divide the area along the transect line into small plots and observe and record plants that occur within the plots. The illustration below shows an example of several transect lines set up at equal intervals with plots along each transect line.



Transect Lines in Study Area

Conducting weed stem counts – By counting the number of live weed stems within a plot, weed managers can estimate the density of weeds in a study area.

Preparation

1 If necessary, help students learn to identify weeds. (Before beginning the *Activity*, students should have the ability to identify **noxious weeds** in their study area.)

2 Discuss the importance of following protocols when conducting a weed inventory.

3 Discuss transect lines and weed stem counts. Explain that students will set up a transect line outdoors, count the number of live weed stems in plots along the transect line, and estimate the population of weeds, based on their stem counts.

Activity

Materials

- copies of the *Inventory Protocol* worksheets – Have available one copy for each student.
- materials listed under *Setting Up a Transect Line* on the worksheet

1 Give each student a copy of the *Inventory Protocol* worksheet.

2 Divide students into teams, with at least three students per team.

3 Assign each team a transect bearing of 120, 240, or 360 degrees.

4 Ask students to follow the instructions, set up the transect line, establish plots along the line, and count live weed stems.

Conclusion and Evaluation

- Conclude the lesson when students have finished taking a stem count of noxious weeds.
- Evaluate students by observing students as they complete the field work, asking pertinent questions to determine students' level of understanding, and determining if students estimated the population density correctly.

Independent Practice and Related Activities

- Have students conduct other types of inventories using different protocols.
- Have students set up a transect line in a pattern that is not circular. Conduct stem counts and compare the results with the results of the first count.

Resources

Hankins, Juley, and Karen Launchbaugh. *Rangeland Vegetation Inventory Field Lab Manual*. University of Idaho Department of Rangeland Ecology and Management.

Vocabulary

inventory, noxious weed, protocol, transect

National Science Education Standards

As a result of their activities in grades 9 to 12, students should develop abilities in and an understanding of the following areas:

Science as Inquiry – Content Standard A: abilities necessary to do scientific inquiry, understandings about scientific inquiry

Science in Personal and Social Perspectives – Content Standard F: environmental quality; science and technology in local, national, and global challenges



This lesson adapted from *Rangeland Vegetation Inventory Field Lab Manual*, by Juley Hankins and Karen Launchbaugh, University of Idaho Department of Rangeland Ecology and Management, Moscow, Idaho 83844-1135. <http://www.idrange.org/educators/FieldLab-Manual.pdf>

Weed Warrior Worksheet

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Set Up a Transect Line

Rangeland scientists cannot count, measure, and record attributes for every plant on rangeland. Monitoring every plant would be very time consuming. Instead, scientists study small plots of rangeland that represent the whole area.

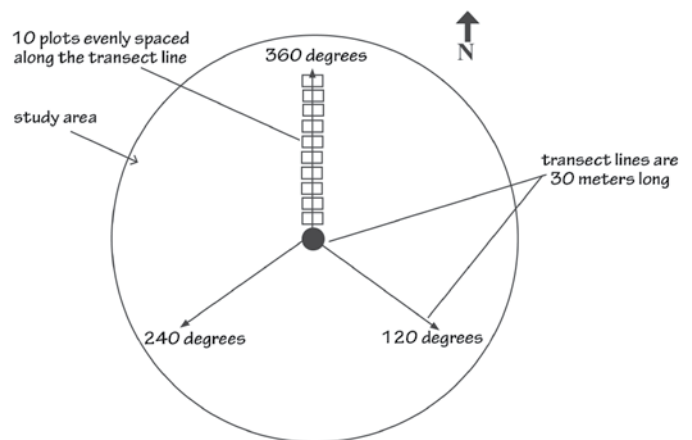
Scientists often use a transect line to collect scientific rangeland vegetation data. A transect line is a straight line through the study area. Study plots are relatively small areas located along the transect line. To represent conditions across an entire study area, scientists monitor the vegetation in several small study plots and average the results of the data. By counting the number of live weed stems present, scientists can determine the density of weeds.

Materials

- one 30-meter measuring tape or transect line
- one compass
- one hammer to pound in stakes
- 90 meters of line
- four plastic tent stakes

- 1** Select a study area. The area should be at least two acres in size.
- 2** Mark the center of the study area with a rock, stake, or other object.
- 3** Use the compass to find North. This bearing represents 360 degrees.
- 4** Have someone stand over the center stake with a compass.
- 5** Starting at 360 degrees, the person in the center holds the compass and turns counterclockwise until the needle points to the next transect heading, which will be 120 degrees or 240 degrees. To obtain the most accurate reading, keep the compass parallel to the ground surface.
- 6** Have the person in the center push the tent stake attached to one end of the transect line into the center point.

- 7** Have a second student take the transect line 30 meters away, in the direction of their team's compass heading.
- 8** Align the transect line with the angle determined by the compass. Pull the line taut, and firmly plant the transect stake into the ground.
- 9** Repeat steps 5 through 9 to set up the transect line for each team.
- 10** Once the transect lines are in place, each team may begin the weed stem count.



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Name _____

Date _____

Conduct Stem Count

Materials

- transect line
- 45 centimeter x 45 centimeter plot frame, constructed from 1/2-inch PVC pipe

- 1 Choose ten, evenly-spaced points along a transect line.
- 2 Place the plot frame at each of these points and count the number of live, noxious weed stems inside the frame; record this number on the chart below.
- 3 If there is more than one noxious weed species present, record the species.
- 4 Repeat the procedure for each transect line.

Location: _____

Noxious Weed Species Present: _____

Frame	Weed Stem Count
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
TOTAL	