

LESSON 35

Wildlife Weed Woes

OBJECTIVES

Students will be able to describe the food needs of a species of Montana's wildlife and identify the impacts that noxious weeds can have on its population.

METHOD

Students role-play foraging elk and gather cards representing different types of food. They then calculate their food intake and how the presence of spotted knapweed might affect food availability for elk.

MATERIALS

- ✎ Colored construction paper cut to 2" x 2" (30 each of yellow, green, and brown; 90 purple)
- ✎ **Individual Recording Sheet** (1 per student)
- ✎ **Group Activity Directions** sheet (1 per group of 5 students)
- ✎ Envelopes (1 per student)
- ✎ Paper
- ✎ Pencils
- ✎ Calculators (optional – 1 per student)
- ✎ Weed identification guides

BACKGROUND

Noxious weeds contribute to the loss of wildlife habitat. Dense infestations of noxious weeds reduce wildlife forage, reduce cover for wildlife to escape predators or hunt for their food, decrease cover for protection from the elements, and change water flow and availability to wildlife. Areas dominated by leafy spurge have been found to receive less use by deer (3 times less use) and bison (4 times less use) compared with similar uninfested areas. Elk use has been found to decrease by 98% on spotted knapweed-dominated range compared to native bunchgrass-dominated sites. Noxious weeds alter the functioning of riparian (wetland) areas. These weeds often lower water tables and, in some areas, have eliminated surface water and native vegetation needed by wildlife.

To illustrate the impact of weeds on wildlife, we can look at one of Montana's game species, elk. The average adult elk weighs more than 500 pounds (225 kg), and eats about 15 pounds (7 kg) of food per day in the spring, summer, and fall, and about 10 pounds (4.5 kg) in the winter. These amounts and type of plants eaten can vary across the state. In spring and summer elk eat a mixture of grasses and forbs (small flowering plants). In the fall they primarily eat grasses and browse (the woody parts of plants). In winter they eat more browse because other sources of food are not as available. Because browse takes more energy

Grade level: 5-8

Subject Areas: Science, math, physical education

Duration: Two 45-minute sessions, extra time for group presentations may be needed

Setting: Outdoors or in gym, then classroom

Season: Any

Conceptual Framework Topics:

Invasive species, weed management, ecological impacts of invasive plants

to chew and digest yet provides fewer calories than other food sources, elk typically need to rely on their body fat to help them survive through the winter season.

This lesson uses figures that represent the yearly average of a typical adult elk's diet in the northern Rocky Mountains. Invasive weeds degrade elk habitat. Land managers often use tools such as seeding, fertilization, water projects, noxious weed treatments, prescribed burning and protective fencing to restore elk habitat. In this lesson students will learn about how invasive plants can impact elk by replacing their natural food sources with plants that less palatable and nutritious.

PROCEDURE

Before doing the activity, cut the construction paper into 2" x 2" cards. For a class of approximately 25 students, make cards of each of the four colors as listed below. Mark the cards as follows (the number after each letter is the number of pounds of that kind of food the card represents):

Yellow (Grasses)—Mark 8 cards G-2000 and 22 cards G-1000

Green (Forbs)—Mark 8 cards F-1250 and 22 cards F-625

Brown (Browse)—Mark 8 cards B-1750 and 22 cards B-875

Purple (spotted knapweed)—Mark 33 cards G-2000, 33 cards F-1250, and 24 cards B-875

1. Begin the activities outdoors or in a gym. Hand out one envelope to each student and have them write their name on it; this will represent their "stomach."
2. Mix and broadly scatter the cards in the playing field. Designate a starting line.
3. Have students line up on the starting line, leaving their envelopes between their feet on the ground. Explain they are elk looking for food and that their envelopes represent their stomach. *Don't tell them what the colors, letters, and numbers represent.* Tell them the cards represent various kinds of elk food. Elk eat different kinds of food at different times of the year, and students will gather different colored squares to represent a variety of food.
4. Explain to students that they must WALK into the area because elk don't run down their food, they graze. When students find a colored square, they should pick it up and return it to their envelope (their "stomach") before picking up another square.

5. Have the students begin gathering food. When all the colored squares have been picked up, the food gathering is over. Return to the classroom with the envelopes of food.
6. Divide the class into groups of 5 students, and hand out the **Individual Recording Sheets** (1 per student) and the **Group Activity Directions** (1 per group). Tell students that they should each take the time to fill out their Individual Recording Sheet (using calculators if needed), then follow the instructions on the Group Activity Directions sheet. Each group will then report to the whole class using a poster they create to illustrate their findings. Each student will need a piece of paper and a pencil.
7. After the students have finished their investigation of elk habitat and their posters are ready, allow each group time to report and present their findings to the rest of the class.
8. Summarize their findings and discuss different reasons elk might or might not have survived. Point out when these are examples of limiting factors.
Limiting Factor: something that limits the ability of the particular species to survive in that habitat.
9. What are some other limiting factors that may affect the survival of elk? Would these factors be similar for other wildlife in an ecosystem?
10. How can knapweed decrease the availability of resources for wildlife? Move into discussion on other noxious weeds found in Montana and their similar effect on wildlife habitat.
11. Conclusion: What can you do to help take care of wildlife habitat?

Extensions

This activity can be adapted for other Montana wildlife species by asking students to research another Montana wildlife species depends on plants for food. Identify its natural food sources and average amounts of food needed each year, as well as how invasive plants threaten to replace its natural food sources. Use the student research results to adapt the game in the lesson to illustrate the impacts of weeds on a range of Montana wildlife species.

Name _____

Individual Recording Sheet

Elk need 5,000 pounds of food every year to survive. A balanced diet for elk includes:

Grasses 2,000 pounds = 40% of an elk's diet

Forbs 1,250 pounds = 25% of an elk's diet

Browse 1,750 pounds = 35% of an elk's diet

TOTAL.....5,000 pounds = 100%

Elk use has been found to decrease by 98% on spotted knapweed-dominated range compared to native bunchgrass-dominated sites.

Your cards are different colors because they all mean something different:

Yellow Cards are grasses, and the number on them shows the pounds eaten

Green Cards are forbs, and the number on them shows the pounds eaten (forbs are flowering plants)

Brown Cards are browse, and the number on them shows the pounds eaten (browse are the woody parts of plants)

Purple Cards represent spotted knapweed, a noxious weed (this is not considered a food source for elk)

Using the cards you collected in the game, fill in the following information:

1. Add up the total pounds of food you gathered (the total of the numbers written on of all of the different colored cards you gathered).

Record the amount here: _____pounds. Based on total pounds, do you expect to survive?
(circle one) Yes No

2. What is the total for your purple cards only? _____pounds

3. Subtract the amount of purple card pounds from your overall total: _____pounds, since knapweed is not a palatable food source for elk but its presence reduces the amount of elk forage available. If you survived in #1, did you still survive once you subtracted out the spotted knapweed from #3? (circle one) Yes No

4. Now separate your cards into piles according to letter code (G, F, and B)

Don't leave purple in its own pile, but match the letters on the purple cards up with letters on the other cards. Total up the amount of pounds for each code letter.

Write your totals : G (Grasses) _____ F (Forbs) _____
B (Browse) _____

5. Elk need a balanced diet, just like humans do, in order to survive. By checking the chart provided to your group, did your elk have a balanced diet during the year? (circle one) Yes No
6. If you took out all of the purple cards that represent spotted knapweed, would your elk still have a balanced diet? (circle one) Yes No

Group Members: _____

Group Activity Directions

Background Information:

You have just picked up a variety of cards and put them in your envelope. Each card represents a different type of forage available to elk during the year. You can check the information sheet attached to find out more about the types of food an elk needs, and how much of each food they need. Every year, the average elk needs 5,000 pounds of food in order to survive. During this activity, your group will be figuring out if each elk consumed enough food. You will determine whether or not spotted knapweed had an effect on your elk's diet. Spotted knapweed, a noxious weed, is not very palatable to elk, and does not provide elk with as much nutrition as native grasses, forbs (flowering plants), and browse (woody plants) do.

Directions:

Step 1: You will need to designate a job for each group member. Write the name of the member next to the job below.

Group Leader (organizes group and reads directions) _____

Recorder (writes down your findings) _____

Researcher (looks up information and reports to group) _____

Analyzer (helps everyone make sense of the data) _____

Designer (helps design the poster that is your final product) _____

Step 2: The *Group Leader* reads the instructions and keeps the group on task. First, each group member gets their own **Individual Recording Sheet**. Complete this page first. Next, each member shares their information and the *Recorder* for the group will be in charge of recording all of the information and compiling it.

Which members of your group survived the year? The *Analyzer* can be an important person here. Everyone should be doing their own math problems, but the analyzer can help when needed.

Step 3: After you have finished the activity, you will be giving a very short report to the rest of the class to share your findings. With the help of your group's *Designer*, you can use any materials you would like to design and create a poster that shows what you found out as a group. You can include charts, graphs, drawings, or cutouts from brochures, and the *Researcher* can provide extra help in finding information and materials. (Please don't cut up books or pocket guides!) Your poster needs to show the rest of the class what you found out.

Now that you have completed this group activity and your poster is ready, decide how you are going to report to the rest of the class. Is only one person going to talk? Are you going to take turns? Get ready to share your findings.