

Enormous Elk

Objective:

Students will be able to compare a life-size bull elk to their own body size.

Methods:

Students use graphing, measuring and drawing techniques to draw a life-sized bull elk.

Background:

An average bull elk weighs about 700 pounds, measures five feet at the shoulder and eight and one-half feet from nose to tail.

Materials:

Elk picture with grid overlay
55+ 12"x12" sheets of construction paper
Pencils
Black marker
Tape

Procedure:

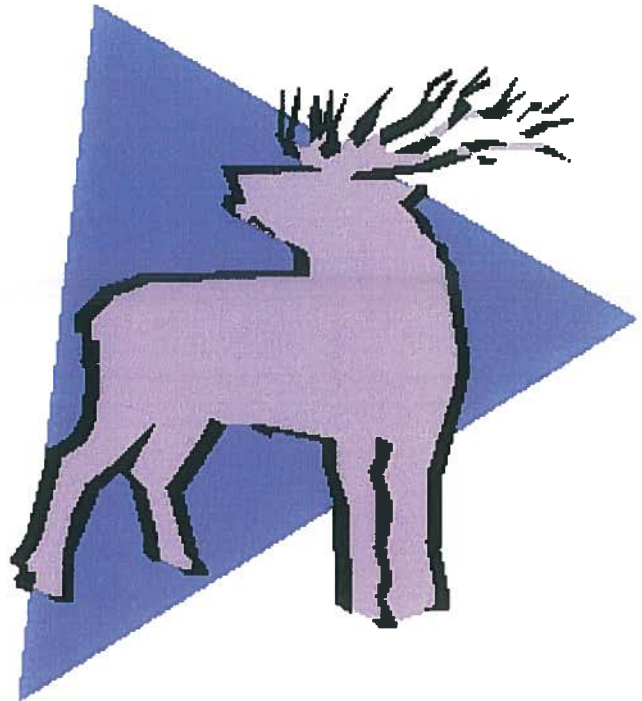
Cut out the elk picture with grid overlay on the lines.

Give each student a blank 12" X 12" piece of construction paper and one or more grid squares. Ask students to lightly number the construction paper in the lower right hand corner with the same grid number.

Instruct students to transfer the drawing from the small square onto the large square.

Better results will be achieved if students lightly quarter their squares with a pencil.

When all squares are completed, tape them



together in order, based on a complete grid drawing.

If necessary, draw over the sketches with a dark colored marker to visually tie them together.

Hang the assembled sheets on the wall for a magnificent life-sized bull elk! Compare the bull elk to the students' size. Were they surprised by the size of an elk?

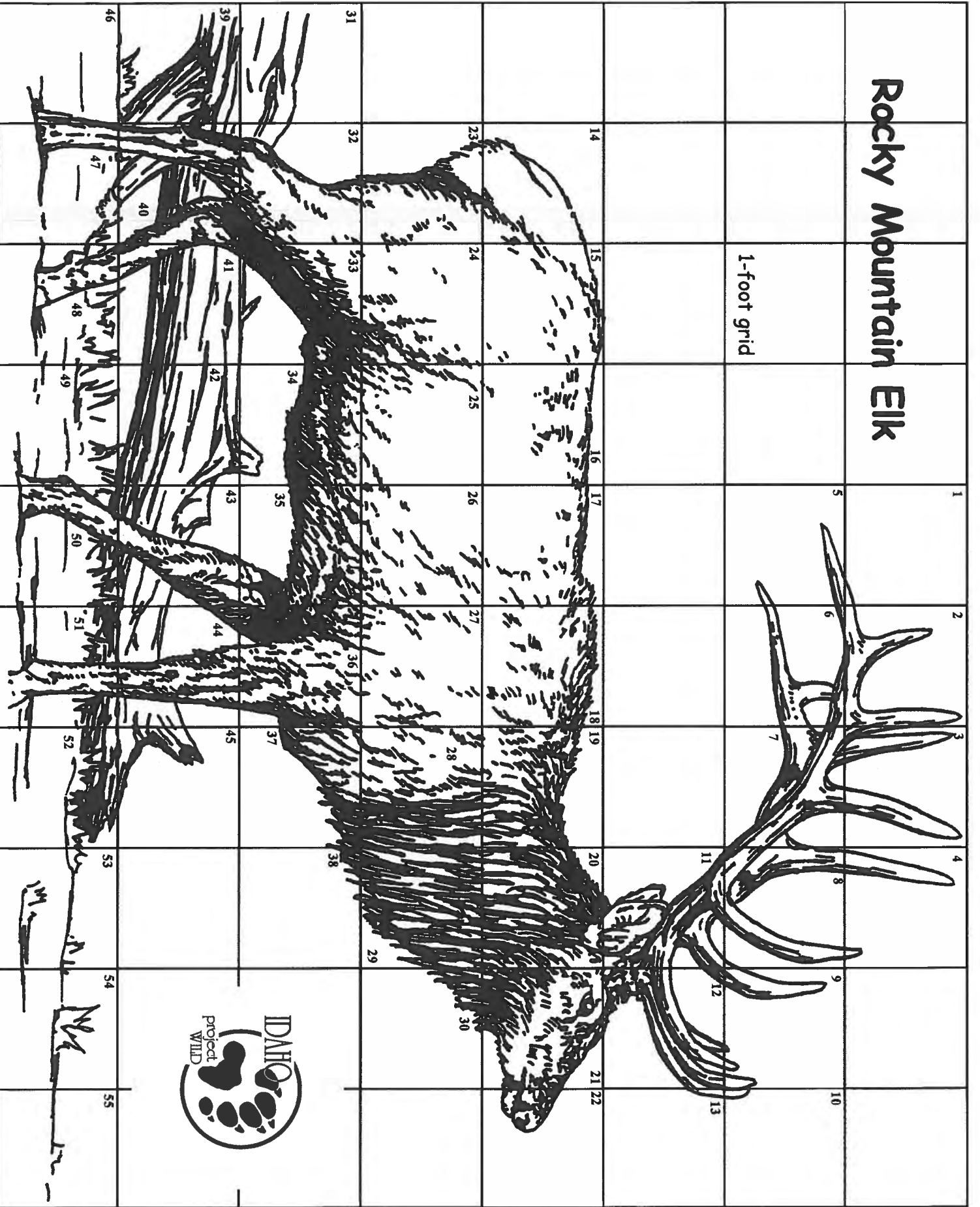
Extensions:

Measure the assembled elk from head to tail and from foot to antler.

Write a story about a bull elk.

Rocky Mountain Elk

1-foot grid



Horns and Antlers

Subject: Science

Objective: Students will review the differences between horns and antlers and write poetry to share their knowledge.

Materials:

- paper
- colored pencils
- research materials or capabilities
- Wildlife Worksheet Horns and Antlers

Procedure:

1. Read and review with students the differences between horns and antlers (see *Wildlife Express*). Here's a quick summary for you:
 - a. Antlers are temporary, solid, often branched, bony structures found on members of the deer family (deer, elk, moose, caribou). During growth, they are nourished by velvet. Antlers are shed in the winter. Soon after, new ones begin to grow. In most species, the male is the only one to grow antlers. Caribou are an exception to this rule.
 - b. Horns are permanent, unbranched, and found on bison, sheep, goats and cattle. Horns have a bony base and inside covered by keratin (similar to fingernails). In some species, the horns never stop growing. In some cases, animals can be aged by counting the number of rings on the horn. The animals are usually one year older than the number of rings.
2. After reviewing, tell your students they are going to write acrostic poems to share their knowledge. Hand out the Wildlife Worksheet Horns and Antlers.
3. Students match the drawings of horns and antlers to the correct animal. Brainstorm the differences between horns and antlers, and then write acrostic poems for each. Your requirements for what the acrostic poems look like will be determined by the age and ability of the students. Some teachers require just words, some full sentences and some accept fragments. All Work!
4. Post poems in the hall to teach other students about horns and antlers!

Wildlife Worksheet
Horns and Antlers—
Do you know the difference?

Write the letter of the name of the animal that wears the horn or antler below.
Circle the antlers.

A. Mountain Goat	B. Bighorn Sheep	C. White-tailed deer	D. Bison
E. Moose	F. Elk	G. Pronghorn Antelope	H. Caribou

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That was fun! Now, brainstorm the differences between horns and antlers and write an acrostic poem. Write your rough draft on this paper and your final draft on another paper.

<p>Hollow Sometimes On head Really Sharp Never Stop Growing Stays on</p>	<p>A bony structure New ones each year Temporary Little at first Elk, Deer, Moose Really used Solid and branched</p>
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Wildlife Worksheet

Horns and Antlers –
Do you know the difference?

Write the letter of the name of the animal that wears the horn or antler below.
Circle the antlers.

- | | | | |
|------------------|------------------|-----------------------|------------|
| A. Mountain Goat | B. Bighorn Sheep | C. White-tailed deer | D. Bison |
| E. Moose | F. Elk | G. Pronghorn Antelope | H. Caribou |



Drawings from enaturalist.org

That was fun! Now, brainstorm the differences between horns and antlers and write an acrostic poem. Write your rough draft on this paper and your final draft on another paper.

H _____
O _____
R _____
N _____
S _____

A _____
N _____
T _____
L _____
E _____
R _____
S _____



Migration Headache

Grades:

4-12

Subjects:

Science, Social Studies, Physical Education, Math, Language Arts

Skills:

analysis, comparing similarities and differences, discussion, evaluation, generalization, hypothesizing, inference, kinesthetic concept development, prediction

Duration:

One 45-minute period

Group Size:

20-40 students or more

Setting:

Outdoors or large indoor area

Project WILD

Conceptual

Framework:

WP II A 2 b 2

WP II A 2 a 2 a

Key Vocabulary:

habitat, limiting factor, migration, population

KEY TEXT:

Chapter 2, pp. 12 & 17; Chapter 3, pp. 20-22; Chapter 4, pp. 24 & 29; Chapter 5, pp. 35-39

Objectives

Students will be able to list limiting factors affecting populations of migrating elk and predict the effects of such limiting factors.

Method

Students role-play migrating elk traveling between their summer and winter range, and simulate the effects of hazards at each end of the migration.

Background

In this activity, students experience some of the important factors that affect the survival of elk that migrate. Healthy populations of elk show little change in numbers over the course of several years. However, various factors can lower a population's number from one year or season to the next. For example, when extremely heavy snows come early in the mountains, elk may become trapped in a narrow valley where there is little winter food. Many elk might die and thus the population would be much lower in the spring.

This activity simplifies the events of migration. For the simulation, the hazards of migration occur at either the calving or the wintering areas. In reality, many of the hazards faced by migrating elk occur en route between the two ranges, or are encountered gradually rather than all at once. After the simulation, you may want to emphasize this point. Also be aware that elk populations can be quite large, so each student may represent many elk, not just one. Because of this, try not to emphasize occasional losses to predation and other events of a relatively small scale during the simulation as they are not likely to affect the size of a real elk population.

For more information about elk migration, see Chapter 4, pp. 24 & 29.

Materials

Large playing field or gymnasium
(at least 70' x 40')

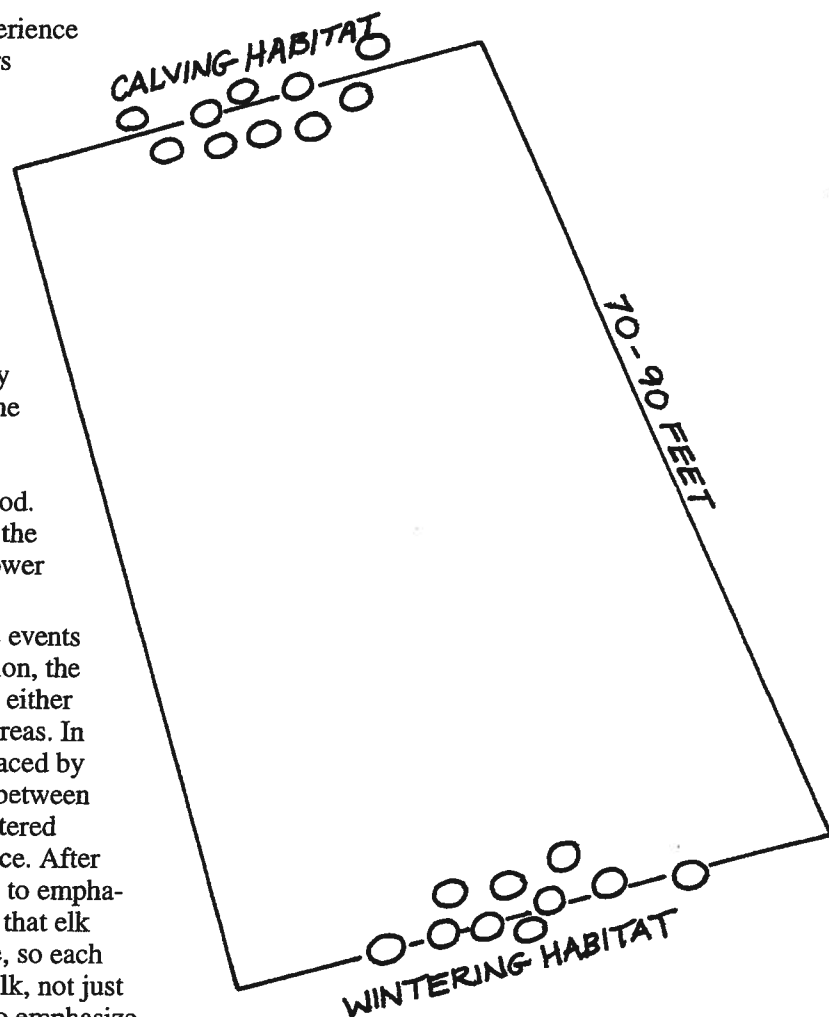
Two paper plates for every three students

Large sheet of butcher paper or graph paper

Marking pens

Procedure

1. Place half of the paper plates in a patch at one end of the playing field, and the other half of the plates in a patch at the other end.



2. Explain to the students that they are elk and will migrate between these two areas at your signal. Explain that as they migrate, students must *walk* because elk do not run when they migrate. Tell them that the paper plates represent suitable habitat for elk. Ask students what must be in an elk habitat. (See Chapter 3 for more information.)

3. Explain that at the end of each journey, the students will have to have one foot on a paper plate in order to continue. Tell them that for the purposes of this activity only three elk can occupy a habitat (paper plate) at any one time. If they cannot get their foot on a plate, that means they have not found any suitable habitat, and they "die." Elk that have died move to the sidelines—at least temporarily—and watch.

4. Begin the activity with all students at the wintering habitat. There should be three students for each paper plate. Announce the start of the first migration. Have students migrate to the calving habitat. Because there is enough habitat (paper plates), all the elk will migrate successfully to the calving habitat.

5. Explain that many factors can limit the survival of populations of migrating elk. Some of these factors involve changes in the wintering and calving habitats. For example, there may be times when there is abundant food, water, shelter, and space suitable for the elk. At other times any or all of these elements may be reduced, limiting the elk's potential for survival.

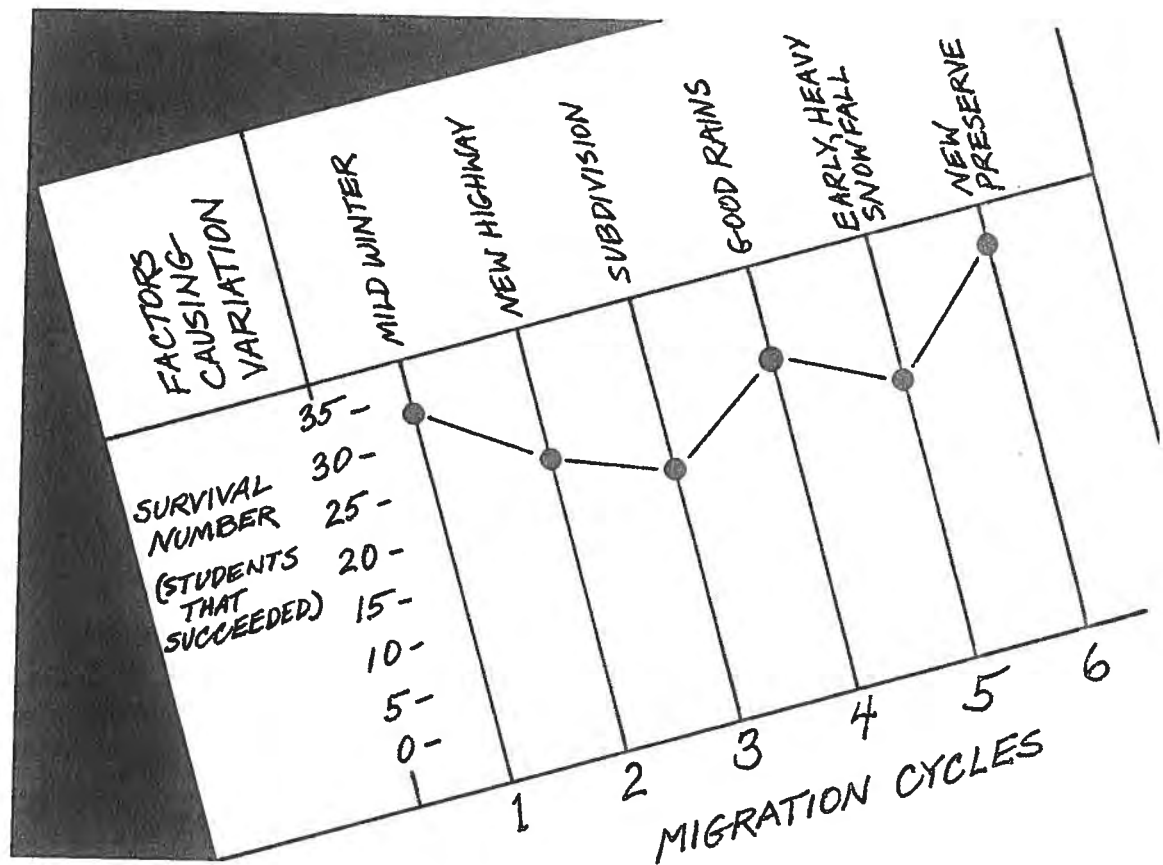
6. Before the elk migrate back to the wintering habitat, remove one plate from the wintering range. Explain that a road has been built through the wintering range resulting in a loss of habitat and an increase in accidents with cars.

7. Repeat the instruction to migrate, and send the elk to the wintering habitat. Three students will be displaced; have them stand on the sidelines. Tell the students that these three elk died as a result of habitat loss and accidents. Remind any "dead elk" that they can come back as surviving calves when habitat is available in the calving area.

8. You may want to graph the migration cycles using butcher or graph paper as shown below.

9. Remove three plates in the calving habitat. Explain that this catastrophic loss is due to a new subdivision that reduced the amount of habitat. Instruct the students to migrate.

This will result in many students waiting on the sidelines, so provide them with an opportunity for re-entry in one of the next cycles.



10. Repeat the process for eight or ten migration cycles to illustrate changes in habitat conditions that affect elk. See the list below for suggestions. (See also pp. 35–39.)

Be sure to create one or more “disaster” years to illustrate catastrophic loss of large areas of habitat. Overall, suitable habitat for elk is diminishing and so the activity should end with less habitat than the elk need.

■ **Factors limiting survival of migrating elk populations**

- urban expansion
- drought
- pollution and contamination of water
- poaching
- highways
- heavy snowfall (greater than 24") causing lack of winter food
- wet, cold weather during calving
- human activity on roads during times of migration
- loss of migration corridors
- loss of thermal cover and hiding cover
- human activity on calving or wintering grounds

■ **Factors favoring survival of migrating elk populations**

- preservation of range lands
- preservation of migration corridors
- early spring plant growth due to mild temperatures and abundant rain
- restoration of habitat
- regulation of hunting
- dynamic balance with predators
- freedom from disturbance during wintering and calving times
- road closures on public lands
- restrictions on public lands during periods of elk use

11. Lead a discussion about what students learned, including:

- What are the apparent causes of the elk population decline?
- What seem to be the major factors contributing to habitat loss and degradation?
- What factors affect the success of elk migration?
- Which are human factors and which are environmental factors?

- What kinds of things can and should be done to protect and restore habitats for migrating elk?
- What are potential trade-offs of these recommendations?

Evaluation

Have students write about the following:

Name two human activities and two environmental factors that might interfere with elk migration. For each, describe possible effects on the elk. Distinguish between effects on individual elk and effects on populations of elk, and indicate if an effect is long- or short-term.

Extension

Repeat the activity using the Lincoln Index (described below) to estimate population size:

1. Identify 2–4 students to be “biologists,” and provide them with masking tape, paper, a marking pen, a pencil, and a clipboard. These students will predict the elk population size, based on data they collect.

2. Explain the Lincoln Index, which can predict a population size based on the number of animals captured after a marking program has begun. To use the Lincoln Index, biologists mark a certain number of animals one year. In subsequent years they can calculate the total population by capturing the same sample size and finding out how many of the captured animals were marked. For example, if biologists were to capture 100 elk in year 1 and mark them with collars, the sample size is 100 elk. In year 2, biologists would capture the same sample size (100 elk). If 50 have collars and 50 are unmarked, the total population size would be estimated to be 200 elk.

$$\text{Total Population} = \frac{\text{known sample size}}{\% \text{ of the sample that is marked}}$$

If only 10 elk had collars and 90 elk were unmarked, the total population would be estimated as $100 \div 10\%$, or 1,000. Point out that this method of estimating population sizes does not take into account birth or death rates or any outside influences.