

## Fifth Grade Lesson Plan: Noxious Weeds & Elk Habitat Lesson Version 2

- Time:** 2 hour
- Curriculum:** Focus on riparian areas and wildlife habitat and the ecological relationships between organisms in an area.
- Objective:** Students will participate in a group activity focusing on elk habitat that is 50% invaded by spotted knapweed, concluding with a discussion about other noxious weeds found in the Jackson Hole area and the similar damage they cause to our native ecosystems.
- Goal:** By the end of the lesson, students will report to the class, describing the food needs of elk and identify the destruction that noxious weeds, particularly spotted knapweed, can cause to a herd.
- Materials:** colored cards, envelopes (1 per student), posters for teacher. Each group receives Weeds of the West, Pocket Guides and a direction sheet. Individuals receive brochure, Invasion of Elk Country, and Activity pages

### Wyoming State Standards Met:

**K-4: Science:** 1.3, 2.1, 2.2, 3.2a; **Math:** 4<sup>th</sup>-1.6, 5.1; 3<sup>rd</sup>-1.5, 5.1; 2<sup>nd</sup>-1.1, 5.1; **Lang. Arts:** 4<sup>th</sup>- 1.1d, 1.1e, 1.3a, 1.3b, 3.1, 3.2, 3.5; 3<sup>rd</sup>-1.3, 3.1, 3.2, 3.3, 3.5; 2<sup>nd</sup>-1.3c, 3.2, 3.3, 3.5; 1<sup>st</sup>-1.3, 2.2, 3.2-4.  
**5<sup>th</sup>: Science:** 1.4, 1.6, 2.1-3, 3.2a, 3.2c; **Math:** 1.3, 4.1, 5.1; **Lang. Arts:** 1.1b, 1.1d, 1.3, 2.2d, 3.1-4.

### Activity:

1. Introductions
  - Check for prior knowledge:
    - Habitat
    - Riparian Areas
    - What do elk need to survive?
  - Explain rules for the activity
  - Hand out envelopes and have each student write their name on it, this will represent their “shelter.” Move to an area, such as outside or in a gym, for the activity.
2. **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 shelter. *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, students should gather different colored squares to represent a variety of food.
4. Explain to students that they **must walk** into the “forest” because elk don't run down their food, they graze for it. When students find a colored square, they should **pick it up and return it to their envelope** (their shelter) 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. Each student will need a piece of paper and a pencil.

6. Divide the class into four groups (for 20 students), and explain what they are going to be researching. All groups will need to designate someone to each job described in the packet. Review expectations for group work and explain the end product which is reporting to the whole class and designing a poster to illustrate what they discovered.
7. Facts included in their packets and teacher's notes...
  - Each elk needs **5,000 pounds a year to survive**.
  - Yellow Cards – Grasses, number represents pounds of grasses eaten
  - Green Cards – Forbs (flowering plants), pounds of forbs eaten
  - Tan Cards – Browse (woody parts of plants), number = pounds eaten
  - Purple Cards – Spotted Knapweed, have a letter to represent the type of healthy food they replaced in the ecosystem and the number of pounds
  - Most of the elk will not survive with the 50% knapweed infestation. However, this doesn't necessarily mean they all died, it means they were forced to move into other areas to find food.
  - Sorting out the colors- Take the purple pile and match the letters up with the letters on the other colors. This represents the different types of food that the knapweed replaced. In one year a typical elk needs...

Grasses.....	2,000 pounds = 40% of their diet
Forbs.....	1,250 pounds = 25% of their diet
Browse.....	1,750 pounds = 35% of their diet
<b>Total.....</b>	<b>5,000 pounds = 100%</b>

- Take a minute to add up your separate piles. Do they match up with the percentages? Did you elk have a healthy well balanced diet?

**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 with the rest of the class.**

8. Summarize their findings and discuss different reasons elk might or might not have survived. These are examples of limiting factors that they probably came up with on their own during the research.
9. Spotted knapweed is an example of a **limiting factor**. What are some other limiting factors that may effect the survival of elk? Would these factors be similar for other wildlife in an ecosystem?
  - **Limiting Factors:** *something that limits the ability of the particular species to survive in that habitat*
10. Move into discussion on **other weeds found in the Jackson Hole area** and their similar effect on wildlife habitat.
  - We used knapweed for the illustration in this activity, but in reality there are 24 unusable, invasive plants **designated by the State of Wyoming**. (use a chart to illustrate, see attached list) The plants listed in red are of a concern in Teton County.
11. **CONCLUSION** – What could you do to be better stewards when taking care of wildlife habitat? What can all of us be doing to help?
  - Serve as a steward of: **MANAGE** (Webster's II University Dictionary)

## State of Wyoming Noxious Weed List

- 1. Field bindweed**
- 2. Canada thistle**
- 3. Leafy spurge**
4. Perennial sowthistle
5. Quackgrass
- 6. Hoary cress (whitetop)**
- 7. Perennial pepperweed**
- 8. Oxeye daisy**
9. Skeletonleaf bursage
- 10. Russian knapweed**
- 11. Yellow toadflax**
- 12. Dalmatian toadflax**
- 13. Scotch thistle**
- 14. Musk thistle**
15. Common burdock
16. Plumeless thistle
- 17. Dyers woad**
- 18. Houndstongue**
- 19. Spotted knapweed**
- 20. Diffuse knapweed**
- 21. Purple loosestrife**
- 22. Saltcedar (tamarisk)**
- 23. St. Johnswort**
24. **Common tansy**

\*This lesson was adapted from the activity “How Many Elk Can Live in this Forest?” in the publication Wild About Elk, produced by the Rocky Mountain Elk Foundation, Project Wild, and the Council for Environmental Education.

## Information Sheet

- Elk need 5,000 pounds of food every year to survive.
- Your cards are different colors because they all mean something different.
  - Yellow Cards- are grasses, the number on them shows the pounds eaten
  - Green Cards- are forbs, the number on them shows the pounds eaten  
(forbs are flowering plants)
  - Tan Cards- are browse, the number on them shows the pounds eaten  
(browse are the woody parts of plants)
- A balanced diet for elk usually 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%**
- Purple Cards represent spotted knapweed
- Spotted knapweed is a noxious weed. This means that it is a non-native plant that pushes out native plants very easily. Use your resources to find out more information on this plant.

### Individual Recording Sheet

1. Each person should add up the total pounds of food that he or she gathered.  
Record the amount here. \_\_\_\_\_pounds
2. Each elk needs 5,000 pounds of food each year to survive.  
Did you survive? (circle one)  
Yes                      No
3. What is the total for your purple cards only? \_\_\_\_\_pounds
4. Subtract your purple cards from your first total: \_\_\_\_\_pounds
5. If you survived in #1, did you still survive once you subtracted out the spotted knapweed from #3?  
Yes                      No
6. Now separate your cards into piles according to color. The purple cards have letters on them. Don't leave purple in its own pile, match the letters up with letters on the other cards. Total up the amount of pounds for each color, pretend the purple cards are now the same color as the pile they are matched up with.  
Write your totals below.  

Grasses (yellow cards)	_____
Forbs (green cards)	_____
Browse (tan cards)	_____
7. 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?  
Yes                      No
8. If you took out all of the purple cards, would your elk still have a balanced diet?  
Yes                      No

## Elk Habitat – Group Activity

Group Member

Names: \_\_\_\_\_

### Background Information:

You have just picked up a variety of cards and put them in your envelope. Each card represents a different type of food that elk eat 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 found enough food. You will be factoring in whether or not spotted knapweed had an effect on your elk's diet. Spotted knapweed, a noxious weed, is not a healthy type of food for elk. It does not have the nutrients that native plants such as grasses, forbs (flowering plants), and browse (woody parts of plants) have. To find out more about spotted knapweed use your Weeds of the West book provided, the Weed Pocket Guides, and different brochures.

### Directions:

**Step 1:** You will need to designate a job for each group member to have. 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:** Follow the activity outlined below to figure out if each member of your group survived the year. Answer the questions as you go, and discuss them within your group. The analyzer can be an important person here. Everyone should be doing their own math problems, but the analyzer can help when needed.

- First, each group member gets their own sheet with the title “Individual Recording Sheet.” Complete this page first!
- Next, each member shares their information and the Recorder for the group will be in charge of putting information on the “Group Recording Sheet.”

**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. 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 cut outs from the brochures. (Please don't cut up the books or pocket guides!) Your poster can be anything you would like but it needs to show the rest of the class what you found out.

Conclusion:

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? Make sure you are ready to share your findings.