

Lesson Plan #4:

Wildlife Crossings (Part 1)

Objectives

Part 1

Students will:

- discover the habitat needs for iconic mammal and bird species in the Greater Yellowstone Ecosystem.
- learn about the negative impacts of development on animals in migration corridors, including habitat fragmentation and wildlife-vehicle collisions (WVCs).
- define important terms such as migration corridor, wildlife-vehicle collision, and habitat fragmentation.

Part 2

Students will:

- explore wildlife's top challenges during migration and identify possible solutions.
- examine existing and proposed local and national solutions to prevent wildlife-vehicle collisions.
- use their knowledge of wildlife biology to design effective wildlife crossings.
- learn one way to address a common wildlife-human conflict.
- discuss the importance of wildlife crossings and share their perspectives.

Overview

In Part 1, students will learn about the habitat needs and migration patterns of local wildlife in the Greater Yellowstone Ecosystem. They will also experience the challenges that wildlife face during migration due to various forms of development. These include food scarcity, small-scale development, then larger-scale development.

In Part 2, students will apply their knowledge to develop solutions addressing wildlife's challenges during migration. They will also explore existing solutions and consider the importance of preserving habitat and wildlife corridors.

Materials

Part 1

- [Wildlife Crossings Animal Info cards](#) (Google Docs)
- 2 ropes or large sticks to mark boundary lines
- small objects to represent food (like Legos or bottle caps)
- clipboard, pencil/pen, paper (for the teacher to collect data)

Part 2

- [Map\(s\)](#) of migration routes for elk, pronghorn, moose, mule deer, Trumpeter Swans or other relevant migratory animals
- [World Record Deer Migration Visualized in 3D for the First Time](#) (4:15 video)
- [Images of Wildlife Crossings](#) *Includes an image of proposed Hwy 22 Snake River Bridge structures.
- paper for creating underpasses or overpasses (large butcher paper if students are working in groups, 8 ½" x 11" if they're working individually)
- colored pencils or markers (for students to create solutions)
- optional: [Barriers](#) film* (10:56) *Previewing advised... even though the elk survives, there's a disturbing fence incident from 2:31-2:40.

Background Information

- [How Wildlife Bridges over Highways Make Animals—and People—Safer](#)- National Geographic
- [Teton County Wildlife Crossings Master Plan \(2018\)](#)
- [Graphic summarizing the 4 crossing structures](#) proposed near the Hwy 22 Snake River Bridge. Construction starts summer of 2023.
- [Trapper's Point- Pinedale, WY](#)
- [JHWF_WVC_Summary_2019](#)

Procedure

1. Brainstorm with students:
 - What are the animals that migrate through Jackson Hole? If needed, use the [Wildlife Crossings Animal Info cards](#).
2. Migration game:
 - Create an area approximately 25 ft x 25 ft, the size of a small classroom.
 - All students gather behind a boundary line on one side of the field of play. Define the students as migratory animals such as elk, pronghorn, moose, mule deer, or other relevant wildlife.
 - Place small objects to represent winter food on the opposite side of the field of play. There should be one or two fewer objects than twice the number of students.
 - Explain that the field of play represents a migratory corridor that the students must cross to get to their winter food source. Students who do not collect tokens representing food will not survive the winter and will be out of the game.
 - Allow roadkill and injured drivers to rejoin the game at the start of each round.

- Collect data at the end of each round to analyze the animals' success rate in crossing the migration corridor.

Year 1: Students representing wildlife walk across the field of play to collect at least two tokens.

- Collect data on the number of animals that survive the winter and those that don't.
- Engage students in a quick debrief to discuss the challenges faced in the migratory corridor.
- Return tokens to the migration route and have all students rejoin.

Year 2: One student builds a "house" halfway down the field of play. This student becomes the "driver" who must drive to and from the town opposite the field of play from their house. During play, the driver runs back and forth parallel to the boundary lines as fast as possible. If the driver tags an animal or vice versa during the migration, the animal is out. The animals try to get to the food on the other side of the migration corridor while avoiding the driver. The driver cannot change his or her speed or direction to tag animals; he or she can only tag animals within reach of the road. The "animals" again try to get to the food on the other side of the migration corridor.

- Collect data on the number of wildlife involved in a wildlife-vehicle collision and those that are not.
- Engage students in a quick debrief to discuss the presence of one house and driver that affected the survival of the rest of the animals.
- Return tokens to the migration route and have all students rejoin.

Year 3: More people are getting jobs in town but building houses just outside of town. One to three more drivers are added to the game.

- Collect data on the number of wildlife involved in a wildlife-vehicle collision and those that are not.
- Engage students in a quick debrief to discuss how the increase of drivers and houses affected the survival of the animals and how many more car accidents happened because of the animals during the migratory season.

The game can be played as many rounds as desired. Encourage students to create reasons for the increase in drivers that correlate with the reasons for urban growth or loss of habitat. At the end of the last round, have students collect all the tokens.

Lesson Plan #5:

Wildlife Crossings (Part 2)

Review from Part 1:

1. What are two problems with building homes or developing in common wildlife areas? *wildlife-vehicle collisions* and *habitat fragmentation* (When an animal cannot get to sources of food, water, shelter, or its mating grounds because of human development, i.e. houses, roads, vehicles, fences, recreation, and domestic animals.)
2. Optional topics for discussion/review:
 - Many animals in the Greater Yellowstone Ecosystem travel hundreds of miles in search of food and mates each year.
 - Trace the migration routes of several iconic Jackson Hole animals on these [maps](#).
 - [World Record Deer Migration Visualized in 3D for the First Time](#) (4:15 video) optional

Based on studies of buried animal remains, we know that pronghorn have been using these migration routes for over 6,000 years.

- Watch [Barriers](#) film* (10:56) *Again, previewing advised... even though the elk survives, there's a disturbing fence incident from 2:31-2:40.
 - What are the top 3 barriers wildlife face during migration? *Fences, roads, housing, and energy development*
 - What are the solutions? *Wildlife-friendly fencing and/or removal, over/underpasses, and controlled growth.*
- Climate change is altering the availability of food, water, and shelter and changing weather patterns for many animals. For the iconic species of the Greater Yellowstone Ecosystem to survive as the climate changes, they must be able to migrate over larger areas to find habitat or move to new areas.
- Species whose individuals get split up by human development are more likely to go extinct.
- What ideas do you have for helping animals to safely travel to/from their homes?
 - One idea for safely facilitating the travel of animals to and from their homes is the implementation of wildlife crossings. These crossings, in the form of overpasses and underpasses, provide safe passages across roads for migrating animals, and have been proposed as a potential solution by people concerned about animal welfare. Look at some wildlife crossings built elsewhere in Wyoming and the world.
 - Share [Images of Wildlife Crossings](#).
- Describe the wildlife crossings. What features do you notice?
 - Building materials? Fencing? Who's using them?

-How does the crossing blend into the areas on either side of the highway?
-Would it be easy for a human to walk up to and over the crossing? How about an animal?

- A crossing will only be effective if it is easy for animals to use and if animals feel safe using it. They usually require tunnel fencing to route to the crossing. Without fencing, the animals are less likely to use the crossing.
- Have students work individually or in small groups. Using paper, pencils, or other tools, have students design a wildlife crossing suitable for their animal. More than one group may be assigned the same animal, or they can choose a migrating animal. If needed, use the [Wildlife Crossings Animal Info cards](#).
- Ask students to consider:
 - How will their crossing attract their animal?
 - What building materials would you want to use? Why?
 - What features should the crossing have on/ in it?
 - What should the dimensions of the crossing be?
 - How would they test the effectiveness of their crossing?
- If time allows, have students take turns explaining why their wildlife crossing will work and why/where it should be built. (*Getting to the Reflection/ Evaluation is more important than having students present.*)

Reflection/Evaluation

As a reflection and evaluation activity, students can answer the following questions:

1. What responsibilities, if any, does our community have to protect our wildlife and this very special ecosystem?

Possible answers: Our community has various responsibilities to protect and conserve wildlife and the special ecosystem we share. These responsibilities include conservation and stewardship, education and awareness, advocacy and engagement, collaboration and cooperation, responsible recreation, and reporting wildlife observations and concerns. By actively fulfilling these responsibilities, we can contribute to the protection and conservation of our wildlife and the unique ecosystem they inhabit.

2. How can wildlife crossings help us to fulfill those responsibilities?

Possible answers: Wildlife crossings can provide numerous benefits, including reducing wildlife-vehicle collisions, restoring wildlife connectivity, conserving wildlife populations, enhancing genetic diversity, promoting ecological sustainability, and enhancing human safety. These structures can effectively mitigate the negative impacts of roads on wildlife and promote coexistence between humans and wildlife.

Possible Extension:

Plan a field trip to see examples of local wildlife crossings.