GRAY WOLVES GRAY MATTER

Exploring the Social and Biological Issues of Wolf Survival

SECOND EDITION

SECTION 3

Social Systems

International Wolf Center™
Teaching the World about Wolves

A PUBLICATION OF THE INTERNATIONAL WOLF CENTER
www.wolf.org

SECTION 3 Social Systems


Jacquelyn Fallon

Gray Wolves, Gray Matter

Exploring the Social &
Biological Issues of Wolf Survival

SECOND EDITION

Educational Services
1396 Highway 169
Ely, MN 55731
P: 218-365-4695 F: 218-365-3318

Administrative and Outreach Office
French Regional Park
12615 County Road 9, #200
Minneapolis, MN 55441
P: 763-560-7374 F: 763-560-7368

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SECTION 3

Social Systems

Subjects:

sociology, mathematics, biology, economics, government

Approximate lesson time:

2 hours

Materials:

game boards, one six-sided die, game cards, chart, scratch paper, pencils, game tokens

Wolf Dollars & Sense

Students play a board game to experience the economic relationship between wolves, ranchers and livestock.

STUDENT OBJECTIVES:

At the end of this lesson, students will be able to:

1. List some problems of raising livestock in wolf country.
2. Appraise the practice of raising livestock in wolf country.
3. Evaluate livestock management strategies that may protect livestock in wolf territories.

PREPARATION:

Make enough game boards and playing pieces so you have one board and playing pieces for every six students.

For simplicity, either:

Photocopy the different kinds of cards onto different colors of paper (white for Facts, green for Management and red for Predator Problems), or

Label the backs of the cards with an F for Facts, an M for Management and a P for Predator Problems.

VOCABULARY:

depredation • livestock • ranches • animal husbandry • aversion conditioning • guard dogs • mortality • eradication • calving

TEACHER BACKGROUND:

There are many implications of a wolf population living near humans and near farms. One major concern is the economic cost of depredation (wolves killing livestock for food). While a very low percentage of livestock operations in wolf country experience depredation each year, most all wolf packs outside protected parks and wilderness eventually kill livestock. Regardless of the statistics, the impact on one rancher can be significant. This game is designed to help students understand the challenges of ranching in wolf country, and how ranchers can make choices that may attract or prevent wolf depredation on their livestock.

Wherever they coexist, wolves may prey on domestic animals. However, wolves normally prefer natural prey such as elk, deer and moose. When wolves kill domestic animals, it is called depredation. Wolves and domestic animals have interacted in North America since the arrival of Europeans with dogs and cattle, yet efforts to understand and manage wolf and domestic animal interactions without whole-scale eradication of wolves did not begin in earnest until the mid-1970s. Much can be gleaned from the data collected in Minnesota,


Daniel Cox, naturalexposures.com

National Science Education Standards

Unifying Concepts and Processes

Change, constancy, and measurement

Science as Inquiry

Abilities necessary to do scientific inquiry

Understanding about scientific inquiry

Life Science (5–8)

Population and ecosystems

Life Science (9–12)

Interdependence of organisms

Science in Personal and Social Perspectives (5–8)

Populations, resources, and environments

Risks and benefits

Science in Personal and Social Perspectives (9–12)

Population Growth

Natural Resources

Environmental Quality

Montana, Idaho and Wyoming to understand, predict and better manage wolf-livestock conflicts.

Wolves became protected under the federal Endangered Species Act (ESA) in 1974. The responsibility to deal with wolf-caused livestock and pet losses then fell to the federal government. Today, in areas where wolves are still classified as "endangered," depredating wolves may only be captured and relocated, not killed, with a few exceptions. Where wolves are "threatened," wolves may be "removed" but only by government agents. "Remove" is a commonly used euphemism for killing a wolf lawfully. In some areas wolves are classified as "experimental nonessential," which means they are technically endangered but special regulations apply that allow managers to remove problem wolves.

Livestock raisers who suffer verified losses to wolves are eligible for compensation in most areas. In Minnesota, the state's Department of Agriculture pays, but in most other areas, private nonprofit groups, such as the Defenders of Wildlife, pay. Ranchers are generally compensated for verified losses at 100 percent of the estimated value of the livestock.

Over the past 25 years, many people have believed that most verified losses occur in summer when livestock are released to graze in open and wooded pastures. Animal husbandry practices, such as calving in forested or brushy pastures and disposal of livestock carcasses in or near pastures, have been assumed to contribute to wolf depredation. Recent research is less certain about the factors leading to depredation.

Cattle, sheep and turkeys are the domestic animals most often taken by wolves. Wolf depredation on dogs is uncommon, since only a small fraction of households estimated to have dogs in wolf range are affected each year. Dog owners in wolf territories can reduce the opportunity for wolf depredation by keeping pets inside or in an enclosed kennel when wolves are known to be in the area.

Some claims of wolf depredation, such as missing calves, cannot be verified. In addition, depredation caused by coyotes is often mis-identified by ranchers as wolf depredation. Managers continue to work with ranchers to develop mutually agreeable methods for verifying and compensating wolf depredation.

Under what circumstances are wolves most likely to attack livestock or pets? Researchers are trying to identify the times and places where wolves are most likely to cause problems, but much remains unknown. Lethal methods are most often used in response to depredation, but several alternative methods have also been tried. These methods include the use of guard animals, electric fences, sirens and strobe lights, improved animal husbandry practices, wolf translocation, electronic training collars, sterilization, diversionary feeding, taste aversion and flagging ("fladry"). These techniques have mixed effectiveness.

ACTIVITIES:

1. In this simulation, students will take the role of farmers and ranchers in an area that contains wolves. Students will make decisions about managing their farms and ranches so they can remain profitable.
2. Each player starts with $5,000 (keep track on scratch paper). Instruct students to keep a tally of their money and reasons why they gain or lose money.
3. During each round of the game, students will roll a die and move their playing piece the corresponding number of spaces.

Landing on M (Management):

If a player lands on a space marked "M," another player picks a card from the Management deck and reads the card to the player who just moved. Some cards will give players a choice, such as "buying a guard dog to chase off wolves." These choices may cost the rancher money, but they may also protect livestock later. If the player has elected to spend money gaining protection, he or she should retain that card until they use it to ward off a predator problem. Most protection cards work only once and are discarded. Hiring more workers works twice, so a player should retain that card and the first predator problem card they receive. When the workers prevent their second predator problem, the protection card and both predator problem cards are discarded.

Landing on F (Facts):

If a player lands on a space marked "F," another player picks a card from the Facts deck and reads the question to the player who just moved. If the player gets the answer to the question correct, the player earns the money listed on the card. After all, knowledge is power and can help farmers avoid costly problems with wolves.

Landing on P (Predator Problem):

If a player lands on a space marked "P," he or she must draw from the Predator Problem deck. Predator problems will usually cost a farmer money, unless he or she has a guard dog or other cards that allow a player to ward off a predator problem. Follow the instructions on the card.

The game is over when all players pass the "Livestock Sale" and collect $2,000 for the sale of the calves of the year. Then, each player should calculate the money they have. Each rancher must have at least $5,000 to break even and to survive until next year. If you want to play more competitively, the player with the most money at the end of the game is the winner.

DISCUSSION:

- Which choices help a rancher succeed in wolf country?
- How feasible is it to raise livestock in places where wolves are present?
- What can ranchers do to reduce livestock losses to wolves?
- In many areas where wolves are federally protected, farmers can receive compensation for verified livestock losses caused by wolves. How would this kind of compensation affect farmers in this game?
- How would compensation affect farmers in this game if they were only compensated for half of their verified losses, or only compensated if they followed prescribed "best management practices"?
- Justify the practice of raising livestock in wolf country.
- If farmers are allowed to shoot wolves on their property, should the taxpayers compensate farmers for livestock lost to wolves? Why or why not?
- Whose money should go toward paying the reimbursement for livestock losses to wolves: the government's or private citizens' through donations to nonprofit groups?
- Discuss the following statement made by Ed Bangs, the U.S. Fish and Wildlife Service's Gray Wolf Recovery Coordinator for the northwestern United States: "Saying that wolf losses to the cattle industry are insignificant—which is true, statistically speaking—is like saying the loss of New Orleans to the national economy is insignificant."

ASSESSMENT:

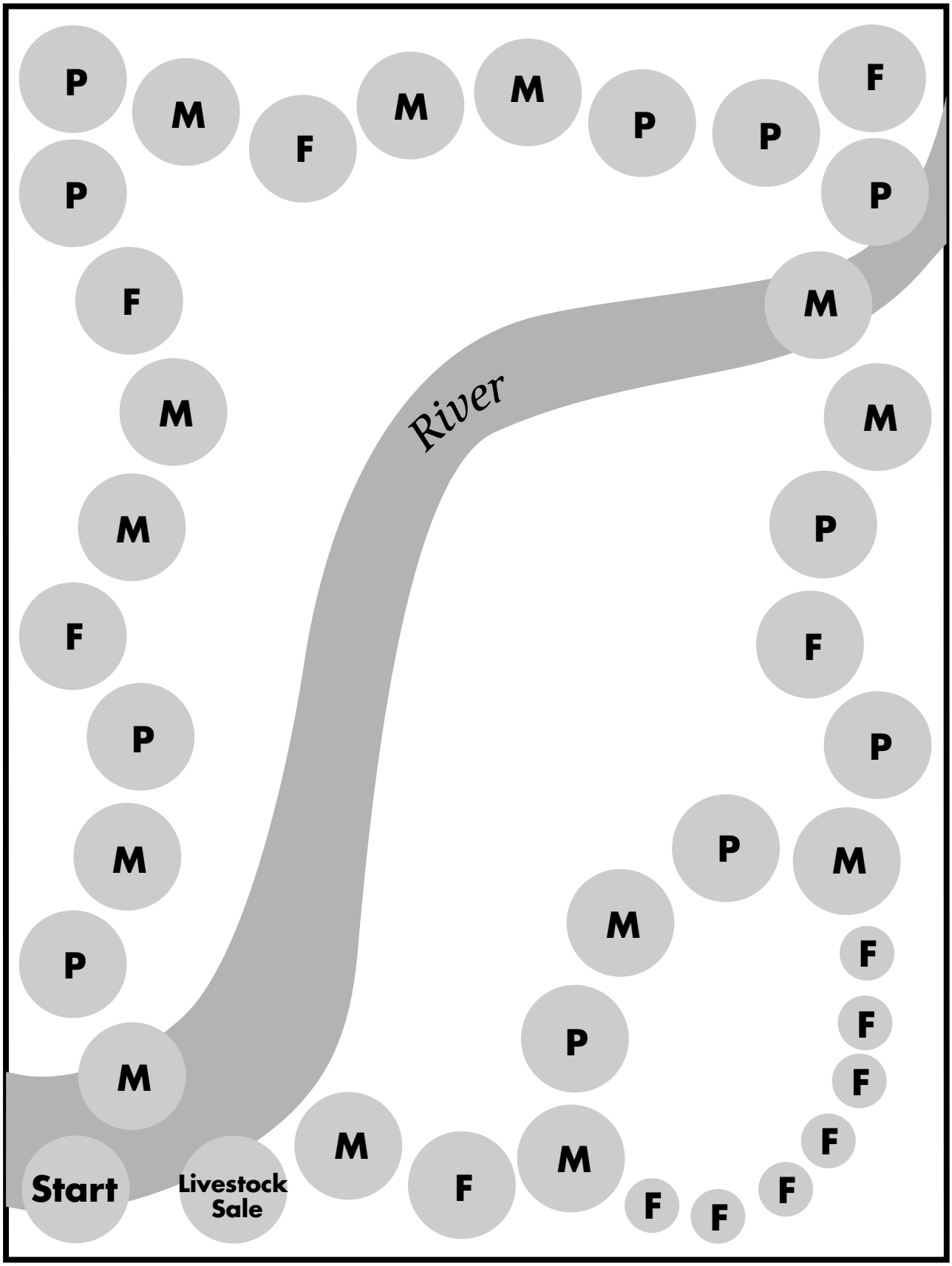
Rubric Assessment:

1. Does the student answer discussion questions fully?
2. Is the student involved in the group discussion?
3. Do answers on the worksheet exhibit a higher level of thinking skills?

EXTENSIONS:

Continue playing the game over the course of several trips around the game board. How does experience improve the rancher's success?

Game Board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Start
Livestock Sale

GAME CARDS "FACTS"

$1,000

Q. What is the scientific name for a wolf?

A. *Canis lupus*

$200 per correct answer

Q. What animals besides wolves kill livestock?

A. coyotes, foxes, mink, weasels, marten, cougars, bobcats, dogs or bears

$500

Q. Describe how to tell the difference between a wolf and a coyote.

A. Coyotes are smaller and have more petite features.

$200 per correct answer

Q. Why do wolves howl?

A. Answers could include communicate with pack, get excited for a hunt, find a lost pack member, and marking territory.

$300 per correct answer

Q. Name a wild food source for wolves.

A. Answer may include deer, moose, beaver, elk, caribou, musk ox, bison, hare

$500

Q. Name three colors wolves can be.

A. Answer can include gray, brown, tan, black and white

$200 per correct answer

Q. Name some wolf adaptations that make them good hunters.

A. excellent sense of smell, eyesight, and hearing; high intelligence, teeth, jaws, long legs for running

$1,000

Q. What is one problem with compensation to ranchers for depredation?

1. It may be difficult to verify a wolf attack.

2. Farmers are not compensated for the "hidden"costs of livestock lost.

$1,000

Q. What percentage of farms in wolf territory tend to experience wolf depredation?
a. 2 percent of farms
b. 3-10 percent of farms
c. 45 percent of farms

A. a. 2 percent of farms

$1,500

Q. How many wolves currently live in the US, outside Alaska? (answer may be +/- 500 wolves)

A. approximately 4,800 wolves

$500

True or false? It is common for wolves to kill people.

A. False.

$500

What nonprofit group supplies funds to pay ranchers when depredation occurs?

A. Defenders of Wildlife

$500

Why don't all wolves eat cows?

A. Answer can include

1. wolves prefer wild food 2. scared away 3. not hungry 4. never learned to hunt cows

$1,000

What are wolves?
a. carnivores
b. herbivores
c. omnivores

A. a. carnivores (meat-eating animals)

$500

Name one folktale or story that involves a wolf.

A. Answer can include
1. "Little Red Riding Hood"
2. "The Three Little Pigs"
3. "Peter and the Wolf"

$500

Which have killed more people in the U.S.?
a. deer
b. wolves
c. bears

A. Deer have killed more people in the woods and on roads because of hunting and car accidents.

GAME CARDS
"PREDATOR PROBLEMS"

Wolves attack your cattle. Lose $100–$600 (roll one die and multiply by $100).

Wolves attack your cattle. Lose $200–$1,200 (roll one die and multiply that times $200).

A mountain lion attacks your livestock. Lose $1,000 for your prize heifer.

Wolves kill your calves. Lose $100–$600 (roll one die and multiply that times $100).

You notice wolf tracks on the edge of your property. If you have protection, discard this card. If you don't, draw another Predator Problem card.

Bear kills a cow and injures two more. Lose $1,000 plus $250 in medical bills.

Coyotes kill your calves. Lose $200–$1,200 (roll one die and multiply times $200). You don't lose any money if you have a dog (don't turn in your dog card this time).

Feral (wild) dogs chase your cows, causing them to trample fencing. Pay $500 and lose a turn while you repair the fences.

Four cows disappear overnight. Lose a turn while you search for them.

Wolves kill the deer that have been eating your hay crop. Gain $100.

Wolves attack your cattle. Lose $100–$600 (roll one die and multiply by $100).

Wolves attack your cattle. Lose $200–$1,200 (roll one die and multiply that times $200).

A mountain lion attacks your livestock. Lose $1,000 for your prize heifer.

Wolves kill your calves. Lose $100–$600 (roll one die and multiply that times $100).

You notice wolf tracks on the edge of your property. If you have protection, discard this card. If you don't, draw another Predator Problem card.

Bear kills a cow and injures two more. Lose $1,000 plus $250 in medical bills.

Coyotes kill your calves. Lose $200–$1,200 (roll one die and multiply times $200). You don't lose any money if you have a dog (don't turn in your dog card this time).

Feral (wild) dogs chase your cows, causing them to trample fencing. Pay $500 and lose a turn while you repair the fences.

Four cows disappear overnight. Lose a turn while you search for them.

Wolves kill the deer that have been eating your hay crop. Gain $100.

Game Cards
"MANAGEMENT"

PROTECTION

Do you want to buy guard dogs to protect your livestock?

Yes: Pay $500. Hold this card until you have a predator problem. Dogs cancel any one predator problem.

No: Discard this card now.

PROTECTION

Would you like to purchase electric fencing to protect your livestock?

Yes: Pay $4,000. You are immune from your next two predator problems.

No: Discard.

• COMPENSATION •

Defenders of Wildlife reimburses you for livestock losses. If you have any predator problems, submit this card for payment equaling 75% of the loss.

Good throughout the game.

You have dead cows to dispose of. Do you A) bury or burn dead livestock or B) dispose of them at the edge of your land?

Choose A: Pay $1,500.
Choose B: Draw a Predator Problem card.

Will you graze your livestock on public land? Yes: Pay $500 for permits and draw Predator Problem card. No: Pay $2,000 in extra feed.

Disease strikes your herd. Lose $500 - $3,000 (roll one die and multiply that by $500) in lost livestock and medical costs.

Drought causes hay shortages, your weaker livestock die.

Lose $50-$300 (roll one die and multiply that times $50).

Property taxes are due.

Pay $350.

Heavy summer storms wash out a bridge and down several trees on your property.

Spend two days cleaning up the damage – lose your next turn.

Market your cows as "Predator Friendly." If you have used any depredation deterrent then when the game is over you can sell your cows for twice their normal value. If not, discard.

• COMPENSATION •

Defenders of Wildlife reimburses you for livestock losses. If you have any predator problems, submit this card for payment equaling 75% of the loss. Good throughout the game.

PROTECTION

Do you want to buy guard dogs to protect your livestock?

Yes: Pay $500. Hold this card until you have a predator problem. Dogs cancel any one predator problem.

No: Discard this card now.

Game Cards
"MANAGEMENT"

PROTECTION

Do you want to use fladry to deter wolves? This means you would hang flagging along your fences to frighten wolves away. Yes: Pay $50 in materials and hold this card. Future predator problems are reduced by 50%. No: Discard.

If you have used depredation deterrents, you qualify for an environmental award. Receive $1000 from a local wildlife group in appreciation for your work protecting wolves.

If you have not used any deterrents, discard this card.

A national news television program broadcasts a report about the wolf conflicts from your farm.

More people become aware of depredation problems and donate money to compensation funds.

PROTECTION

Do you want to hire a trapper to remove nearby wolves?

Yes: Pay $500. Hold this card until you have a wolf predator problem. Trappers cancel your next wolf problem. Discard after one use. No: Discard this card.

Rough winter kills livestock. Lose $1,000-$6,000 (roll one die and multiply that times $1000). Also ignore you're next predator problem. Hold this card until you need it.

Discard after one use. (Wolves and other predators are feeding on dead deer in the area.).

PROTECTION

Would you like to purchase electric fencing to protect your livestock?

Yes: Pay $4,000. Hold this card. The next time you have a wolf attack, roll a die. If you roll a 1 or 2, you have no livestock losses. **No:** Discard and hope for no wolf attacks.

PROTECTION

Do you agree to participate in research on non-lethal depredation deterrents? If so, this means allowing biologists to experiment with a variety of methods for keeping wolves away.

Yes: roll the die to see if they work. If you get 1 – 3 they work and hold this card to protect you from future predator problems. If you get 4 – 6 they don't work, discard this card.

No: Discard this card.

Game Cards
"MANAGEMENT"

PROTECTION

Do you want to hire more workers to guard livestock? Yes: Pay $1500. Hold this card until you have a predator problem. Workers cancel your next two predator problems. After the second predator problem, discard both the worker and predator cards. No: Discard.

If you have used any depredation deterrents, you can offer eco-tours of your farm and the surrounding wilderness to tourists. Pay $1000 in expenses (liability insurance, tour guides) and roll the die for earnings. (multiply the number you roll times $500). If not, discard.

PROTECTION

Do you want to try a low-cost method of protecting your cows? Drive around the perimeter of your pastures all night to deter wolves from approaching.

Yes: Hold this card and prevent one predator problem, but lose a turn catching up on your sleep.

No: Discard this card.

PROTECTION

Would you like to purchase electric fencing to protect your livestock?

Yes: Pay $4,000.
Hold this card. The next time you have a wolf attack, roll a die. If you roll a 1 or 2, you have no livestock losses.

No: Discard and hope for no wolf attacks.

PROTECTION

Would you like to "take care of wolves" yourself? (eg. shoot, shovel, shut up)

Yes: Pay $200 in time and ammo, and roll the die. If you rolled a 1 or 2, you kill a wolf and can ignore your next predator problem. Hold this card until you need it. If you roll a 3, 4, or 5, nothing happens, discard. If you roll a 6, you are caught by the U.S. Fish and Wildlife Service and fined $10,000 for shooting an endangered species. You also lose two turns while you are in jail.

No: Discard this card.

Jacquelyn Fallon

Back From the Brink

Students graph and compare human and animal populations over time, then profile sample endangered species.

SECTION 3

Social Systems

Subjects:

sociology, mathematics, biology, economics, government

Approximate lesson time:

2 hours

Materials:

graph paper, pen/pencil, copies of endangered species profiles

STUDENT OBJECTIVES:

At the end of this lesson, students will be able to:

1. Summarize the Endangered Species Act.
2. Classify the reasons why an animal might become "endangered."
3. Graph population trends over time.

VOCABULARY:

population • Endangered Species Act • endangered species list • extinct • recover • extirpate • endangered • threatened

TEACHER BACKGROUND:

As early as the 1930s, wildlife biologists were noticing steep declines in wildlife abundance and began passing laws to protect game animals. However, these laws were usually not applied to "vermin" (problem) animals like wolves, crows and coyotes, or to nongame animals like insects and songbirds.

In 1973, the U.S. Congress passed the Endangered Species Act to protect the plants and animals of our country. A species is listed as "endangered" if the U.S. Fish and Wildlife Service (USFWS) decides that it is in danger of becoming extinct. It is listed as "threatened" if the USFWS decides that an animal is in danger of becoming "endangered."

Animals listed as endangered or threatened are not allowed to be imported, exported, hunted, collected, harassed, transported for commerce or used in any way without permission from the USFWS. The act requires the USFWS to develop a recovery plan for the listed species. The recovery plan must describe what the USFWS will do to increase the listed species' population until it is out of danger of extinction.

Scientists estimate that at least one species of plant or animal disappears every 30 minutes—that's 17,520 species that go extinct every year.

Animals are generally more prone to becoming endangered or going extinct if they:

1. Interfere in some way with people's activities. Some animals kill livestock, prize game animals (like elk or fish), or damage agricultural crops. Many animals have been killed for this reason (wolves,

mountain lions, ospreys, eagles).

2. Have particular nesting or food requirements. If an animal species needs a specific kind of habitat in which to nest and raise young, or if an animal eats only one or a few kinds of food, when those habitats or food sources disappear, so does the animal species. Worldwide, 60 percent of animal extinctions are due to habitat loss. As the human population increases, space for wildlife habitat decreases.

3. Have small litters or long gestation periods. Animals that have few young in a litter, such as bison, are more likely to become endangered than those animals that have many young in a litter, like rabbits.

4. The animal has high commercial value. Some animals, like beavers in the 1700s and 1800s, were so valuable for their pelts that they were hunted almost to extinction. A similar trend can be seen in whale hunting today. Even if an animal is protected by national and international laws, if the price is right, some people are willing to ignore the laws.

5. Are highly sensitive to chemical pollutants. Certain species of frogs and fish are sensitive to toxic chemicals. From the 1940s to the 1960s, bald eagle populations dropped significantly because they had eaten fish that had high levels of DDT. This toxin caused the birds to lay fragile eggs, and the eggs were crushed during incubation.

See Appendix II for more information about the Endangered Species Act.

Daniel Cox, naturalexposures.com

National Science Education Standards

Unifying Concepts and Processes

Evidence, models, and explanation

Change, constancy, and measurement

Life Science (5–8)

Populations and ecosystems

Science in Personal and Social Perspectives (5–8)

Risks and benefits

Science in Personal and Social Perspectives (9–12)

Population Growth

Natural Resources

Environmental Quality

ACTIVITIES:

PART ONE: Dangerous Trends

1. Statistics often help researchers understand particular aspects of a problem. Instruct students to graph trends for worldwide human population growth, U.S. human population growth, urban land growth, U.S./Canada mammal and bird extinctions, world mammal and bird extinctions, amount of trash generated per person, per day, and U.S. gray wolf populations (see tables on page 81)
2. Discuss:
   - Which graphs are similar to each other?
   - Which seem to run opposite to each other?
3. In small groups, instruct students to theorize how the statistics in these graphs may be related to each other.
   - How would larger cities affect species?
   - What trend do you see in animal populations over the past 50 years?
   - What could humans do to reverse this trend?
   - What have humans done to prevent animals from going extinct?
4. Discuss what the Endangered Species Act is and what it does to protect animals. Or distribute Appendix II as a reading page to familiarize them with the act.

PART TWO: Profile of an Endangered Species

1. As a class, brainstorm a list of endangered species. Look over the "Endangered Profile" and come up with three reasons why species become endangered.
2. Divide students into small groups, and make sure each group can explain why each animal on the brainstormed list is in danger of going extinct.
3. As a class, discuss each group's ideas.
   - Are there exceptions to these reasons? (e.g., coyotes and black flies are "pest" species, and we can't seem to get rid of them)
   - Why do we seem to have an overabundance of certain species (e.g., starlings, zebra mussels)?

ASSESSMENT:

A. Assessment Quiz

1. Give examples (written or oral) for three ways in which the graphs in Part One are related to each other.
2. Hypothesize other factors (not described in the graphs) that may affect animal and human populations.

B. Assessment Project "Animalopia National Wildlife Survey"

1. Give students the hypothetical "Animalopia National Wildlife Survey." Tell students they have been hired as wildlife consultants to the nation of Animalopia (a small country in Eastern Europe that has a climate and landscape similar to Montana). Their job is to figure out which animals are in danger of extinction and why.
2. Once they have decided which animals need protection, tell them that finances in Animalopia are tight, and the government can only work to recover one species at a time. Have students rank the animals in order of preference, from first species recovered to last species recovered. Students should explain the reasons for their rank order.

EXTENSION:

1. Have students research animal species that have gone extinct in the past 200 years. Using the criteria for why species may become endangered, have students determine why these creatures went extinct. Are there additional reasons for why an animal might go extinct that the classes didn't list in the above activity?
2. Animalopia National Wildlife Survey: After students have decided which animals need government protection, make a class list of the animals that students agree would be in danger of going extinct, based on the criteria the class discussed earlier in the activity.

U.S. POPULATION

Year	Population (in millions)
1800	5
1820	9
1840	19
1860	28
1880	54
1900	80
1920	110
1940	136
1960	180
1980	230
1990	249
2000	281
2005	295

Source: www.npg.org

WORLD POPULATION

year	millions of people
1650	550
1700	610
1750	760
1800	950
1850	1210
1900	1630
1950	2520
2000	6200
2005	6462
2010	6840 (projected)

Source: www.npg.org

GLOBAL SPECIES EXTINCTION

Year	Recorded extinctions per year
1600	0
1650	5
1700	17
1750	10
1800	22
1850	25
1900	115
1950	140
2000	35–150 species every day

Source: http://math.ucr.edu/home/baez/extinction/

TRASH GENERATED

Year	Trash generated (in lbs./person/day)
1960	2.6
1970	3.5
1980	3.7
1990	4.5
1995	4.4
2000	4.6
2005	4.4

Source: National Solid Waste Management Association

U.S. GRAY WOLF POPULATION (EXCLUDING ALASKA)

Year	Estimated number of wolves
1900	?
1960	600
1970	768
1980	1310
1990	1624
2000	3427
2005	4816

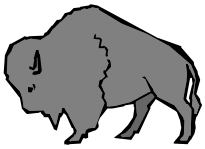
Source: International Wolf Center

Endangered Species Profiles

Gray Wolf

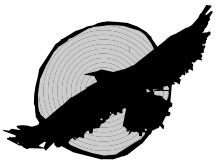
Gray wolves are predators who kill and eat elk, deer, moose and other prey. They average four to six pups in a litter every year. Pups are ready to breed in two or three years, but usually only the alpha, or "breeding," pair in a pack has pups. Other pack members help raise the young. Gray wolves have been hunted, trapped and poisoned for the past 300 years in North America because they were seen as a threat to livestock and big-game animals.

American Bison



The American bison, or buffalo, once roamed the Great Plains in herds numbering in the millions. Market hunting and wholesale slaughter decimated the bison herds and led to government protection. Recently, bison near Yellowstone National Park have been shot due to concerns that they may spread a bovine disease to nearby livestock. Bison only have one calf per year.

Osprey



An osprey is a hawklike raptor that hunts fish in rivers and lakes. It swoops down out of the sky and grabs a fish in its talons. It then lands on a tree branch, nest or beach and eats its dinner. The osprey, like many raptors, was seen as a competitor for resources with humans. Many ospreys and other raptors were shot as "chicken hawks," which might eat a farmer's poultry. Raptors are now protected by federal laws against hunting and poisoning. But since the 1940s, agricultural chemicals such as DDT have caused declines in osprey populations. Some of these chemicals are stored in an osprey's fat cells when they eat contaminated fish, and cause ospreys to lay thin or sterile eggs. Destruction of rain-forest winter-nesting areas is also harming osprey populations.

Woodland Caribou

Woodland caribou are native to the boreal forests of North America. When loggers came to Maine, Minnesota and other areas, they hunted the caribou for food and clear-cut large areas of the northern forest. After logging, forest fires from slash piles (branches) left behind by loggers burned up the caribou moss (thick, gray, ground-dwelling lichen) on which the caribou depended for food. Caribou are now extirpated from most areas of the lower 48 states.

Black-footed Ferret

The black-footed ferret lives in the Great Plains and feeds almost exclusively on prairie dogs. As ranchers raised livestock on the Great Plains starting in the late 1800s, the holes that prairie dogs dug came to be seen as a threat to cows, who might step in a hole and break their leg. Subsequent prairie dog eradication projects sharply reduced the food source for the ferret.

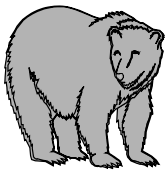
Lynx

The lynx is a wild cat about the size of a bobcat that lives in the boreal forests of the northern United States and southern Canada. The lynx feeds almost exclusively on the snowshoe hare. Hare populations fluctuate in a 10-year cycle. In years when the hare population is low, some lynx starve; in years when the hare population is high, the lynx eat well.

Animalopia
National Wildlife Survey

This is a survey of wildlife in the newly independent (fictitious) nation of Animalopia. You have been asked to assess the nation's wildlife resources and determine which animals are in need of government protection. Please list reasons for your answers. The Animalopia Legislature must see sufficient evidence to justify funding research and recovery planning for each species.

Go Fish Freshwater fish species, has 20 to 30 young per year, eats mosquito larvae and several other aquatic worms in swamps and ponds, often introduced to new areas by humans to help control mosquito populations.

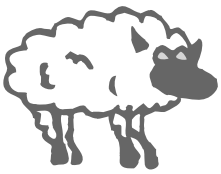


Hunny Bear Species similar to the U.S. black bear, but is half the size, and the fur has a distinctive bluish cast. Historically hunted for valuable fur, it eats a wide range of fruits, nuts and insect larvae. Females have only one cub every two years.

Mystery Beetle Beetle species found in only one valley on the outskirts of the capital city of Waldorn. This beetle may carry a disease that is fatal to fruit trees in the region. It eats leaves and flowers of many kinds of plants. But for some reason (possibly climatic conditions or a rare flower eaten by the beetle larvae), the beetle isn't found outside its home valley.

Who Caribou A species similar to caribou in North America, it eats lichen off of bare rock outcrops that were recently burned by forest fires. Females have one to two calves every year. Some wild caribou have been domesticated by northern residents and are raised like cattle in open pastures.

Cool Cat A species similar to our mountain lion. It kills caribou, sheep, deer and occasionally cows for food. Females have one to two cubs per year. Cool cats have been known to kill humans.



Bo Peep Sheep A wild sheep species. Females outnumber males in the population by four to one. Females produce two to three young every year, sometimes breeding twice in one year. They eat grass and a variety of other woody and herbaceous plants. Main predators include humans and cool cats.

You Can Toucan This bird nests in forest edges near farm fields and cities. It eats wild seeds and insects but can also collect food from garbage dumps. It lays eggs every other year.

Patriot Hawk National bird. Eats mice and small rabbits. Requires tall old-growth pine trees for nesting. Migrates to North Africa during the winter. Birds are eight years old before they reach sexual maturity.

Itsy Bitsy Spider Eats small flies and other small insects. Common in forests at least five miles from agricultural lands. Very susceptible to agricultural pesticides. It has a significant impact on fly populations in its regions.

Jacquelyn Fallon

SECTION 3

Social Systems

Subjects:

reading skills, sociology, biology

Approximate lesson time:

2 hours

Materials:

copies of several wolf folktales

Folktale Focus

Students categorize folktales and research cultural connections.

OBJECTIVES:

At the end of this lesson, students will be able to:

1. Analyze how wolves are portrayed in world folktales.
2. Assess how folktale presentations of wolves might affect people's opinions of wolves.

VOCABULARY:

folktale • myth • cultural values
legend • culture • attitudes

TEACHER BACKGROUND:

The stories that people tell often reflect their opinions about things in the natural world. This activity is designed to allow students to evaluate versions of wolf folktales (stories that arose orally in a culture) and determine what values a society holds based on how they portray wolves in their stories. Since folktales are an indicator and a transmitter of cultural values (likes and dislikes), this activity uses stories to understand how people from different countries historically felt about wolves, and why they might have felt that way.

ACTIVITIES:

1. Ask students to list wolf stories they have heard. Discuss how the wolf is portrayed in these stories.
2. Divide the students into small groups. Assign each group to read one of the stories on pages 22-27. Suggest the students read the story several times.
3. While they are reading, students should use the Folktale Evaluation Worksheet to note how the wolf is portrayed in their story. Often, a wolf is portrayed as being mean (or dangerous), foolish, wise or helpful.
4. Ask students to categorize the wolf portrayal in their stories. Their final characterization could be a combination of several images.
5. Group students according to how the wolf is portrayed in their stories (mean, foolish, wise, helpful). Instruct students to look for similarities in the cultures that portray wolves in a certain way.
6. Draw generalizations about which kinds of cultures have more positive views of wolves, and which have more negative views.


Daniel Cox, naturalexposures.com

National Science Education Standards

Unifying Concepts and Processes

Evidence, models, and explanation

Change, constancy, and measurement

7. Representatives from each theme group will give a presentation to explain what their group learned about the portrayal of wolves in stories. This presentation could be oral, pictorial or videotaped.

DISCUSSION:

1. How do people in 21st-century U.S. culture view wolves? How is this different from or similar to what you read in your stories?
2. Which countries or cultures had wolf stories that portrayed wolves as mean or evil? Helpful or friendly? Why do you think this was the case?
3. Has reading and hearing about different wolf stories affected how you think about wolves?
4. Which would have a larger impact on your view of wolves: a folktale or a news story about wolves? Why?

ASSESSMENT:

1. Group reports may serve as an assessment for this activity.
2. Have students write an answer to the following question: Why do some people read scary stories and become fearful of wolves while other people read the same stories and are not fearful?

EXTENSIONS:

1. Have students research the country of origin for their group's story. Answer the following questions:
   a. How did the people who originally told these stories make their livings (typically from the 1600s and earlier)? *By raising livestock, grain farming, hunting and gathering, fishing*
   b. How does the way people make a living play a role in their attitudes about wolves?
2. Students could learn their wolf stories and present them to a class of younger students as a way to teach other students about wolf tales.
3. Have students visit an elementary school library or a bookstore and survey all the books having to do with wolves. Compare how the wolf is presented and discuss how the stories might affect a youngster's view of wolves.
4. Select any of the stories on pages 22-27 and have students write a new version of that story, changing its emphasis (for example, change a "wolf is foolish" story into a "wolf is wise" story).
5. Instruct students to reflect in writing on a time when they were alone and something that was not normally a scary thing became threatening or they were fearful of being harmed. Why did they feel this way, and how did they handle it?

NAME: _____

FOLKTALE FOCUS

Folktale Evaluation Worksheet

Story What descriptive	phrases or words are used to describe the wolf? What specific actions does	the wolf take in the story? What do other characters in the story do to	the wolf? Wolf Portrayal (foolish, mean, helpful or wise)	

Folk Stories on the Wolf

Donkey in a Lion's Skin (Aesop's Fables)

One day, a donkey was walking down a road, when he saw a lion lying in a ditch. At first, the donkey was frightened, but then he noticed that the lion was not moving. He approached more closely and realized that the lion was dead.

"I've always wanted to have a lion fur coat," said the donkey, so he skinned the lion and put on its coat. When animals saw the donkey wearing the lion's skin, they thought that he was a giant lion coming to get them.

"Run away, run away, a lion is coming," called the animals. The donkey was so pleased by the effect he was having on the other animals, that he began to laugh. "Eh haw, eh haw," laughed the donkey.

Just then, he heard a rustle in the bushes behind him. It was a wolf. "Brother donkey, you almost had me fooled. I was just about to run away from you in that lion's skin, but then you opened your mouth and I realized it was a donkey and not a lion that I was seeing."

"The next time you want to appear like a lion," said the wolf, "be sure to keep your donkey's mouth shut."

(Retold by Storyteller Kevin Strauss, copyright 2006)

Wolf and Dog (Aesop's Fables)

One evening, driven by hunger, a wolf wandered close to a farmstead. At the edge of the fields, she met a creature that looked much like herself. "Who are you?" said wolf.

"I am a dog, and from your smell, you must be a wolf," said dog.

"Well then, we must be cousins. But tell me, cousin dog, how is it that while I am starving, you seem to be plump and healthy," said the wolf.

"There is plenty of food at my master's house for animals who work. I bark to frighten away robbers and wild animals. In exchange for guarding the house and barns, my master gives me scraps from his table," said dog.

"Do you think that I could work for your master as well?" said wolf.

"Sure, there is much work to be done. Just follow me," said dog.

As they approached the master's house, wolf noticed that dog had a ring around his neck where the fur was gone and the skin was worn red. "What happened to your neck, dog?"

"Oh that, it is nothing. Every night my master ties me up so I stay nearby to protect the house. The rope wears the fur off of my neck, but it is a small price to pay for food and lodging. You will get used to it soon enough, wolf."

The wolf stopped. "No, I don't think I can get used to that," said wolf.

And she ran back into the woods.

(Retold by Storyteller Kevin Strauss, copyright 2006)

The Hungry Wolf

(This is a version from Kazakhstan, but there are similar versions from Finland and Russia.)

One day, wolf was feeling hungry, so he sniffed the air and began looking for some dinner. "Ah, goat meat," he said, sniffing the air. The wolf ran up to the goat and growled, "O.K. goat, its time for dinner and you're the dinner."

"If that's my fate, then there's nothing to be done about it. But as you can see, I am really quite old and thin. If you let me go home, I will get my daughter. She is quite young and plump," said the goat.

"O.K., but be quick about it, I am hungry," said the wolf.

The goat went back to the herd and got the goatherd. The wolf heard the sound of barking dogs, and the goatherd came running with his rifle. "Bang, bang," the bullet whizzed over the wolf's head as he ran into the woods. "Well, that's the last time I will trust a goat to do what he says," said the wolf as he rested in a cave.

The next day, in another field, wolf smelled a sheep. "Mmmm. Mutton, I love mutton," said the wolf. The wolf ran up and grabbed the sheep. "O.K. sheep, its time for dinner, and you're the dinner," growled the wolf.

"Well if that's my fate, I guess I can't escape," said the sheep, "but before you eat me, I have always wanted to dance my circle dance before I die. Since you are going to eat me anyway, could I dance before I die?"

"O.K., but you have to stay where I can see you," said the wolf, and he lay down to rest before dinner. The sheep danced around wolf again and again, each time making a larger and larger circle. As she danced, she sang a song. The song put wolf to sleep, and the sheep ran off to find a shepherd. Once more, wolf had to run from dogs and men, and he was still hungry. "I should never let my prey leave my grasp," said the wolf.

The next day, wolf traveled farther on the steppe, where he met an old horse. "O.K. horse, it's time for dinner, and you're the dinner," growled the wolf.

"Fine, I am old and have lived far too long already. My master no longer feeds me grain, he just leaves me to graze in dry fields. But since you are going to eat me anyway, could you start with my tail, so I may keep on grazing?" said the horse.

"Very well, but you can't move," said the wolf. When the wolf went behind the horse, the horse kicked out with both of his hind hooves, sending the wolf flying across the steppe. And that was the end of that foolish wolf.

(Retold by Storyteller Kevin Strauss, copyright 2006)

(Note: A "steppe" is a prairielike grassland area in central Asia.)

The Wolf on the Prairie (Cheyenne)

(This is a Cheyenne story first published by George Bird Grinnell in By Cheyenne Campfires, *in 1926. The following is my retelling of this historical tale. The Sand Creek Massacre happened on November 29, 1864, and ended with 200 Cheyenne and Arapaho, mostly women and children, dead and mutilated. The massacre started a war between the United States and Plains tribes that didn't end until 25 years later with the massacre at Wounded Knee. In 1902 when this story was recorded, one of the women involved was still alive.)*

It had been a long journey to Fort Lyon, but the elders said we would be safe there. Our leaders were promised protection if we camped near the fort. But safety meant soldiers with guns. Our warriors tried to defend the camp, but there were too many soldiers. My husband was wounded. He told us to go. My sister and I and our two daughters crept off into the night. If we traveled quickly, we might reach another village of our people and be safe. We traveled on and on, six or seven days, and it was cold, so we took shelter in a small cave in the side of a cliff.

That was when he came. The children were asleep when I saw a large shape walk on all fours into the cave. It lay down beside us and went to sleep. In the morning, I saw that it was a large gray wolf. We were frightened at first, but the wolf seemed to act like one of our dogs. It walked next to us, stopping when we had to rest. We tried to walk quickly, but we had not eaten in days. Finally, my sister looked at the wolf and said, "O wolf, please do something for us. We and our children can barely walk with our hunger."

When she spoke, the wolf seemed to listen to her. Then it got up and ran over the hill. Soon, the wolf came running back, and it had blood on its muzzle. It led us over the hill, where we saw a dead buffalo, surrounded by gray wolves. The wolves were not eating. We ate quickly and carried some meat for later. When we were finished, our friend wolf and the other wolves ate the rest of the buffalo.

We kept traveling day after day. One night, we made a camp in a hollow with some willows. That night, we heard noises. Something was coming, and it was breaking sticks as it came. I told my sister and our daughters to get up. The wolf stood up and began howling. Its voice was answered by the voices of wolves all across the valley. The sounds came closer. The wolves came down and began fighting with the thing. We ran out of the valley as far as we could. The next morning, our wolf caught up with us. It lay down to rest when it found us.

We kept traveling, but with the new fallen snow on the ground, we couldn't find the trails of our people. Finally, my sister looked at the wolf and said, "Friend wolf, please help us find the trail of our people." The wolf seemed to listen and ran off. When it came back, it led us across the prairie to an old camp, where we found food that our relatives had left for us. From there, the wolf ran off again. We camped for a few days there. When the wolf returned, it led us to a high hill. When we looked down from the hill, we saw a huge village of our people. The wolf stayed on the hill as we ran down to our people. Our relatives were happy to see us. My sister took a bundle of buffalo meat up the hill to the wolf.

"Now that you have led us to our people, you can go back to your old ways. Thank you," she said.

The next day, she went up the hill again, but the wolf was nowhere to be seen. The meat was gone as well.

(Retold by Storyteller Kevin Strauss, copyright 2006)

Murphy and the Wolf (Ireland)

Long, long ago, a man named Murphy was walking from Dublin to a neighboring town. As the road passed through a dark forest, he heard a rustling in the bushes.

Being a sensible man, he drew his sword and stood very still. A moment later, a huge black wolf sprang from the forest to attack him. But old Murphy used to be a solider, and each time the wolf lunged, he would fight it off with his shining sword. Finally, bruised and cut, the wolf stumbled back into the darkness of the woods to wait for easier prey.

As the road left the forest, Murphy could see a town in the distance. He also saw his friend walking toward him on the road. "You're not going through the woods, are you," said Murphy.

"I've got to get to Dublin, so I guess I am," said the friend.

"Well then, at least take my sword. There is a terrible wolf in the woods, and if you have a weapon, you can fight him off," said Murphy. The friend thanked Murphy and continued on his way.

The friend had just entered the woods when the wolf sprang from the bushes. The friend drew Murphy's sword. The wolf stopped. It recognized Murphy's sword and realized that Murphy was unarmed. The wolf ran down the road after Murphy.

Suddenly, Murphy heard the sound of a running wolf. He turned to see that black wolf right behind him. Murphy tried to run for the town gates, but the wolf was too fast. It caught Murphy and killed him right there on the road.

(Retold by Storyteller Kevin Strauss, copyright 2006)

Rolf Peterson

Wolf and the Honey Pots (Germany)

Long, long ago, wolf was starving in the forest. He hadn't eaten for weeks. It seemed as if all of the deer and rabbits had left the forests. So in desperation, he began hunting closer and closer to the houses of people.

One night, as he was entering a village, he met a fox. "Tell me, fox, how can I get something to eat? I am starving. You know this place. Tell me where I can find food," said the wolf, as his white teeth glistened in the moonlight.

Fox was worried that if he didn't find the wolf some food, the wolf would eat him.

"Shhhhh, be quiet and I will show you where we shall get enough food for you. There is a farmer nearby who keeps bees. I have been watching him collect honey each day and carry jars of honey down to his basement. Now that it is dark, we can go there and eat our fill," said fox.

Wolf followed fox along the hedge to the house where the farmer lived. "Here is the cellar window. Push it open and we can go inside," said the fox, "Everyone's asleep. You need not be afraid."

"I'm not afraid," said wolf, "I'm just cautious. A careless wolf is a dead wolf. That's what my father used to say."

Finally, fox pushed open the basement window and crept inside. Wolf followed.

Once inside the cellar, fox and wolf saw four big pots full of honey. "The first pot is mine, since I have already eaten half of it. The rest of the pots are for you," said fox.

Wolf chose a pot and started lapping up the sweet honey. Fox lapped honey from his pot, then he climbed out through the window to be sure he could still fit. Then he would eat some more. Then he went back to the window again.

"Why are you going to the window all the time?" said wolf. "I just want to make sure that the road is still clear. Don't worry, you just go back to eating," said fox.

Wolf was very hungry, so he went back to eating. Once fox was done eating, he decided that it was time to play a trick on wolf. While wolf was busy with his head in a honey pot, fox sneaked out the window to tell the farmer that wolf was in the basement eating all of his honey.

The farmer grabbed a stick and rushed down to the cellar to beat the wolf. "How dare you steal my honey, your four-footed thief!" said the farmer as he beat the wolf with his stick. The wolf ran for the window, but after eating so much honey, he was too fat to get all the way through. He could only get his head and front legs out, not the rest of his body. The farmer gave the wolf such a beating that his howls echoed across the village. Finally, battered and bruised, the wolf pulled himself through the window.

Fox was waiting in the bushes at the edge of the forest when wolf found him. "Why didn't you tell me that the farmer was coming? I should tear you to pieces!" said the wolf.

"It's not my fault," said fox. "When I heard the farmer coming, I had to run myself and didn't have time to warn you."

"You are lying, and I am going to kill you," said the wolf.

"You'll have to outrun the farmer's dog first. Look, here he comes," said fox.

Wolf turned and leapt behind a bush, but when he looked for the dog, it wasn't there, and neither was the fox.

(Retold by Storyteller Kevin Strauss, copyright 2006)

The Mountain Wolf's Gift (Japan)

Long ago, near Kyoto, there lived a young merchant. One night, the merchant was forced to travel through a narrow mountain pass on business. The new moon hid her face from the sky, and the night was inky dark. The merchant held his paper lantern in front of him, and though he was shaking, walked into the forested pass. The trail was narrow but well marked. The trees seemed to be twisted together, blocking out even the faint starlight. There were places in that pass where the trees were so thick that it was frightening even in the daylight. People talked of monsters and ogres in these mountains, but the merchant tried not to think about that as he walked. Then he heard it, up ahead to the right. It was a strange, deep snoring sound.

"That must be the wind," he thought. But the wind doesn't snore. "Perhaps it is a badger or a squirrel," he thought. Finally, he couldn't take it any longer. He had to see what it was or run back to Kyoto in terror, so taking his paper lantern, he stepped off the path and into the forest.

Not far from the path, he found the source of the strange snoring noise. In a small clearing stood a huge black wolf. At first the merchant wanted to run, but he stood still. Then he noticed something strange about the wolf. Its mouth was open, and it kept stretching its neck in and out. But it didn't try to run away at all. Thinking this was very strange, the young merchant walked closer to the wolf.

The wolf, who had been standing, kneeled down on his front legs as if to bow. To the merchant, it looked as if the wolf were begging for help. The wolf opened its mouth wide, and the merchant could see something was caught in the wolf's throat.

"So that's the problem. Here, I'll take it out for you," said the merchant. Slipping one arm out of his kimono, the merchant put his hand down the wolf's throat and pulled out a thick piece of bone. "Next time, you are going to have to be more careful when you eat bones like this," said the merchant. The wolf whined softly in relief and disappeared into the mountain forest.

Several days went by. The young merchant was invited to a harvest celebration in the neighborhood. The guests were in the middle of the feast when everyone heard a deep growl at the door. The host looked out his window and turned ghostly pale. "Everyone, grab your swords. There is a huge black wolf at the door, a wolf at the door," cried the host.

Everyone turned pale and began shaking with fright. But the merchant walked up to the door. Through the window he saw the wolf that he had helped. "Don't worry, I'll take care of this," said the merchant as he walked through the door.

The guests ran to the windows to watch what would happen. They knew that the merchant was unarmed. When the wolf saw the young merchant, he suddenly became as quiet as a kitten. He padded up to the merchant's feet. When the merchant patted its head, it licked his hand in joy.

"You seem much happier without that bone in your throat," said the merchant. Then, as if remembering something, the wolf took something black that he had beside him and dropped it with a thud on the doorstep. As the merchant reached down to examine the gift, the wolf slipped silently away.

The merchant looked closely and saw that the wolf had brought him a huge pheasant. Perhaps it was the wolf's way of thanking the merchant for the favor it had received.

(Retold by Storyteller Kevin Strauss, copyright 2006)

ACKNOWLEDGMENTS:

The stories in this collection have been adapted and retold by Storyteller Kevin Strauss. You may contact him for many more resources on wolf folklore at kevin@naturestory.com. For other written versions of these stories, consult the following sources.

Donkey in a Lion's Skin S. A. Handford. *Aesop's Fables.* New York: Puffin Book, 1994.

Wolf and Dog Christine Allison. *365 Bedtime Stories.* New York: John Boswell Association, 1998.

The Hungry Wolf Mary Lou Masey. *Stories of the Steppes.* New York: David McKay Co., 1968.

The Wolf on the Prairie Denise Casey and Tim Clark. *Tales of the Wolf.* Moose, WY: Homestead Publishing, 1996.

Murphy and the Wolf W. Carew Hazlitt. *Faiths and Folklore.* London: Reves and Turner, 1905.

The Wolf and the Honey Pot Kurt Ranke, ed. *Folktales from Germany.* Trans. Lotte Baumann. Chicago: University of Chicago Press, 1966.

The Mountain Wolf's Gift Keigo Seki, ed. *Folktales of Japan.* Trans. Robert J. Adams. Chicago: University of Chicago Press, 1963.

William Rideg, Kishenehn Wildlife Works

Jacquelyn Fallon

SECTION 3

Social Systems

Subjects:

reading, language arts, sociology

Approximate lesson time:

1–2 hours

Materials:

Each group needs a copy of each story on pages 34-38, paper and pencil.

Little Red Takes Many Paths

Students compare and contrast different versions of the* Little Red Riding Hood *story.

STUDENT OBJECTIVES:

At the end of this unit, the student should be able to

1. Describe how children's stories like *Little Red Riding Hood* affect our views of wolves.
2. Demonstrate how traditional stories transmit cultural values.

VOCABULARY:

culture • motif

TEACHER BACKGROUND:

Folktales are stories that pass by word of mouth from one generation to another and from one country to another. Often stories change over time because storytellers adapt them to serve their own purposes.

It wasn't until the 1800s that folklorists began collecting folktales and writing them down for the first time. Once these authors had preserved these traditional stories in books, the stories stopped changing and became a "snapshot" of one particular time and place in that story's evolution. Traditional folktales have no one "correct" version of a story because they continue to change each time they are passed along. There are often several versions of the same story "motif" or general story type.

By looking at the different versions of a particular story, students can draw inferences about what the author intended to communicate through a particular version of the story.

In general, stories demonstrate the cultural views of the society that created them and passed them on. For cattle farmers in central Europe, wolves were a threat. In other countries, where wolves were more scarce or where abundant wild prey kept wolves from feeding on domestic livestock, the stories that people tell about wolves are much more positive. Stories from other regions, like Finland, Japan or Russia, show much more positive views of wolves. In Japan, wolves are revered for feeding on the deer that would otherwise feed on farmer's crops.


Daniel Cox, naturalexposures.com

National Science Education Standards

Unifying Concepts and Processes

Evidence, models, and explanation

Change, constancy, and measurement

The versions presented in this lesson grew out of the farming country of central Europe (Germany and France). In those countries, wolves may have fed on calves and sheep, depriving farmers of money and food. Therefore, stories from that area reflect a dislike for wolves. Stories like *The Three Little Pigs* and *The Wolf and the Seven Goats* also come from central Europe and also reflect negative views of wolves.

By comparing and contrasting different versions of the same story motif, students can infer how that culture probably viewed wolves when the stories were first written down. The "moral" of a story also gives readers a sense of the cultural values that were popular when the writer took the "snapshot" of the story.

ACTIVITIES:

PART 1

1. Instruct students to write down a brief outline of the story of *Little Red Riding Hood* as they know it. Remind students to include as many details as they can think of. Students should work individually for this part.
2. Then, organize students into groups of four. Instruct students to exchange stories and then complete the following questions as a group.
3. Discuss:
   - What story elements appear in all versions of the story?
   - What differences did you find in the different versions of the story?
   - How did each person describe Little Red: her age, her appearance, her attitude?
   - How did each person describe the wolf and its motivation in the stories?

Note: These questions are provided on page 97 for the teacher to copy onto transparency film for use on an overhead projector.

PART 2

1. Divide the students into small groups, and give each group a copy of each of the four stories on pages 34-38.

2. Instruct students to compare the stories by filling in the chart on page 33.

3. Discuss:
   - Describe how the country or time period in which a version of a story gets published might affect how the story is written.
   - Which Little Red Riding Hood character acted the way you would act if you ever encounter a talking wolf who dresses up in grandma's pajamas?
   - What other species of animals appear as villains in stories? Is it always a predator, or are herbivores (plant eaters) ever cast as villains? What accounts for the trend that you find?

ASSESSMENT:

Students may turn in completed worksheets. Students may also write a one-page essay summarizing the differences between the versions of the *Little Red Riding Hood* story.

EXTENSIONS:

Use the World Wide Web to look up other versions of this story. There are versions of *Little Red Riding Hood*–type stories from around the world. Look for versions from Asia, the Middle East, the African continent and North and South America. What differences do you find in these other versions of this story?

Have students write their own, modern version of *Little Red Riding Hood*. How does it differ from these older versions?

Check your home or public library for multiple versions of this story, and compare the artwork in the various editions. What information does a picture convey?

ADDITIONAL RESOURCES:

Web sites

"Little Red Riding Hood" from Wikipedia, the free encyclopedia: http://en.wikipedia.org/wiki/Little_Red_Riding_Hood

"Versions of Little Red Riding Hood," D. L. Ashliman folktale Web site at http://www.pitt.edu/~dash/type0333.html

Other resources

"The Mountain Wolf's Gift: Wolf Tales From Around the World" audio CD. Contains nine traditional wolf folktales depicting wolf characters that are wise, foolish, tricky or helpful.
The CD is available from storyteller Kevin Strauss, http://www.naturestory.com.

LITTLE RED TAKES MANY PATHS
Overhead Master for Part One

What story elements appear in all versions of the story?

What differences did you find in the different versions of the story?

How did each person describe Little Red: her age, her appearance, her attitude?

How did each person describe the wolf and its motivation in the stories?

NAME: _____

WORKSHEET FOR PART TWO

Little Red Takes Many Paths

	Story 1	Story 2	Story 3	Story 4
Story name				
Source				
Year				
Description of girl				
Distinctive garment, how she got it?				
What instructions did she get from her mother?				
What is she carrying?				
Where does grandmother live?				
What does she think of wolf upon meeting him?				
How does the wolf get to grandmother's ahead of her?				
What's the situation upon Red's arrival?				
How does the story end?				
What's the "moral" of the story?				

Little Red Riding Hood

Charles Perrault (Victorian Era France)

This story version was collected some time between 1500 and 1600. The version was edited and published during the "Victorian Era," a time in Europe when writers often adapted stories to teach clear moral lessons to children. What lessons do you see and hear in this story?

Once upon a time there lived in a certain village a little country girl, the prettiest creature who was ever seen. Her mother was excessively fond of her, and her grandmother doted on her still more. This good woman had a little red riding hood made for her. It suited the girl so extremely well that everybody called her Little Red Riding Hood.

One day her mother, having made some cakes, said to her, "Go, my dear, and see how your grandmother is doing, for I hear she has been very ill. Take her a cake, and this little pot of butter."

Little Red Riding Hood set out immediately to go to her grandmother, who lived in another village.

As she was going through the wood, she met with a wolf, who had a very great mind to eat her up, but he dared not, because of some woodcutters working nearby in the forest. He asked her where she was going. The poor child, who did not know that it was dangerous to stay and talk to a wolf, said to him, "I am going to see my grandmother and carry her a cake and a little pot of butter from my mother."

"Does she live far off?" asked the wolf.

"Oh, I say," answered Little Red Riding Hood, "it is beyond that mill you see there, at the first house in the village."

"Well," said the wolf, "I'll go and see her too. I'll go this way and go you that, and we shall see who will be there first."

The wolf ran as fast as he could, taking the shortest path, and the little girl took a roundabout way, entertaining herself by gathering nuts, running after butterflies, and gathering bouquets of little flowers. It was not long before the wolf arrived at the old woman's house. He knocked at the door: tap, tap.

"Who's there?"

"Your grandchild, Little Red Riding Hood," replied the wolf, counterfeiting her voice, "who has brought you a cake and a little pot of butter sent you by mother."

The good grandmother, who was in bed because she was somewhat ill, cried out, "Pull the bobbin, and the latch will go up."

The wolf pulled the bobbin, and the door opened, and then he immediately fell upon the good woman and ate her up in a moment, for it been more than three days since he had eaten. He then shut the door and got into the grandmother's bed, expecting Little Red Riding Hood, who came some time afterwards and knocked at the door: tap, tap.

"Who's there?"

Little Red Riding Hood, hearing the big voice of the wolf, was at first afraid, but believing her grandmother had a cold and was hoarse, answered, "It is your grandchild Little Red Riding Hood, who has brought you a cake and a little pot of butter mother sends you."

The wolf cried out to her, softening his voice as much as he could, "Pull the bobbin, and the latch will go up."

Little Red Riding Hood pulled the bobbin, and the door opened.

The wolf, seeing her come in, said to her, hiding himself under the bedclothes, "Put the cake and the little pot of butter upon the stool, and come get into bed with me."

Little Red Riding Hood took off her clothes and got into bed. She was greatly amazed to see how her grandmother looked in her nightclothes, and said to her, "Grandmother, what big arms you have!"

"All the better to hug you with, my dear."

"Grandmother, what big legs you have!"

"All the better to run with, my child."

"Grandmother, what big ears you have!"

"All the better to hear with, my child."

"Grandmother, what big eyes you have!"

"All the better to see with, my child."

"Grandmother, what big teeth you have got!"

"All the better to eat you up with."

And, saying these words, this wicked wolf fell upon Little Red Riding Hood and ate her all up.

Moral: Children, especially attractive, well-bred young ladies, should never talk to strangers, for if they should do so, they may well provide dinner for a wolf. I say "wolf," but there are various kinds of wolves. There are also those who are charming, quiet, polite, unassuming, complacent and sweet, who pursue young women at home and in the streets. And unfortunately, it is these gentle wolves who are the most dangerous ones of all.

Source: Andrew Lang, The Blue Fairy Book *(London, ca. 1889), 51–53. Lang's source: Charles Perrault,* Histoires ou contes du temps passé, avec des moralités: Contes de ma mère l'Oye *(Paris, 1697).*

Little Red Cap

Jacob and Wilhelm Grimm (Germany)

This is the version of Little Red Riding Hood that most people are familiar with. The Grimm brothers collected their stories from both the common folk of farmers and the more educated classes.

Once upon a time there was a sweet little girl. Everyone who saw her liked her, but most of all her grandmother, who did not know what to give the child next. Once she gave her a little cap made of red velvet. Because it suited her so well, and she wanted to wear it all the time, she came to be known as Little Red Cap.

One day her mother said to her, "Come Little Red Cap. Here is a piece of cake and a bottle of wine. Take them to your grandmother. She is sick and weak, and they will do her well. Mind your manners and give her my greetings. Behave yourself on the way, and do not leave the path, or you might fall down and break the glass, and then there will be nothing for your sick grandmother."

Little Red Cap promised to obey her mother. The grandmother lived out in the woods, a half hour from the village. When Little Red Cap entered the woods, a wolf came up to her. She did not know what a wicked animal he was, and was not afraid of him.

"Good day to you, Little Red Cap."

"Thank you, wolf."

"Where are you going so early, Little Red Cap?"

"To grandmother's."

"And what are you carrying under your apron?"

"Grandmother is sick and weak, and I am taking her some cake and wine. We baked yesterday, and they should give her strength."

"Little Red Cap, just where does your grandmother live?"

"Her house is a good quarter hour from here in the woods, under the three large oak trees. There's a hedge of hazel bushes there. You must know the place," said Little Red Cap.

The wolf thought to himself, "Now there is a tasty bite for me. Just how are you going to catch her?" Then he said, "Listen, Little Red Cap, haven't you seen the beautiful flowers that are blossoming in the woods? Why don't you go and take a look? And I don't believe you can hear how beautifully the birds are singing. You are walking along as though you were on your way to school in the village. It is very beautiful in the woods."

Little Red Cap opened her eyes and saw the sunlight breaking through the trees and how the ground was covered with beautiful flowers. She thought, "If a take a bouquet to grandmother, she will be very pleased. Anyway, it is still early, and I'll be home on time."

And she ran off into the woods looking for flowers. Each time she picked one she thought that she could see an even more beautiful one a little way off, and she ran after it, going farther and farther into the woods. But the wolf ran straight to the grandmother's house and knocked on the door.

"Who's there?"

"Little Red Cap. I'm bringing you some cake and wine. Open the door for me."

"Just press the latch," called out the grandmother. "I'm too weak to get up."

The wolf pressed the latch, and the door opened. He stepped inside, went straight to the grandmother's bed, and ate her up. Then he took her clothes, put them on, and put her cap on his head. He got into her bed and pulled the curtains shut.

Little Red Cap had run after flowers and did not continue on her way to grandmother's until she had gathered all that she could carry. When she arrived, she found, to her surprise, that the door was open. She walked into the parlor, and everything looked so strange that she thought, "Oh, my God, why am I so afraid? I usually like it at grandmother's." Then she went to the bed and pulled back the curtains. Grandmother was lying there with her cap pulled down over her face and looking very strange.

"Oh, grandmother, what big ears you have!"

"All the better to hear you with."

"Oh, grandmother, what big eyes you have!"

"All the better to see you with."

"Oh, grandmother, what big hands you have!"

"All the better to grab you with!"

"Oh, grandmother, what a horribly big mouth you have!"

"All the better to eat you with!" And with that he jumped out of bed, jumped on top of poor Little Red Cap, and ate her up. As soon as the wolf had finished this tasty bite, he climbed back into bed, fell asleep, and began to snore very loudly.

A huntsman was just passing by. He thought it strange that the old woman was snoring so loudly, so he decided to take a look. He stepped inside, and in the bed there lay the wolf that he had been hunting for such a long time. "He has eaten the grandmother, but perhaps she still can be saved. I won't shoot him," thought the huntsman. So he took a pair of scissors and cut open his belly.

He had cut only a few strokes when he saw the red cap shining through. He cut a little more, and the girl jumped out and cried, "Oh, I was so frightened! It was so dark inside the wolf's body!"

Little Red Cap

(continued)

And then the grandmother came out alive as well. Then Little Red Cap fetched some large heavy stones. They filled the wolf's body with them, and when he woke up and tried to run away, the stones were so heavy that he fell down dead.

The three of them were happy. The huntsman took the wolf's pelt. The grandmother ate the cake and drank the wine that Little Red Cap had brought. And Little Red Cap thought to herself, "As long as I live, I will never leave the path and run off into the woods by myself if mother tells me not to."

One week later, Little Red Cap was taking some baked things to her grandmother when another wolf spoke to her and wanted her to leave the path. But Little Red Cap took care and went straight to grandmother's. She told her that she had seen the wolf, and that he had wished her a good day but had stared at her in a wicked manner. "If we hadn't been on a public road, he would have eaten me up," she said.

"Come," said the grandmother. "Let's lock the door, so he can't get in."

Soon afterward the wolf knocked on the door and called out, "Open up, grandmother. It's Little Red Cap, and I'm bringing you some baked things."

They remained silent and did not open the door. The wicked one walked around the house several times and finally jumped onto the roof. He wanted to wait until Little Red Cap went home that evening, then follow her and eat her up in the darkness. But the grandmother saw what he was up to. There was a large stone trough in front of the house.

"Fetch a bucket, Little Red Cap," she said. "Yesterday I cooked some sausage. Carry the water that I boiled them with to the trough." Little Red Cap carried water until the large, large trough was clear full. The smell of sausage arose into the wolf's nose. He sniffed and looked down, stretching his neck so long that he could no longer hold himself, and he began to slide. He slid off the roof, fell into the trough, and drowned. And Little Red Cap returned home happily and safely.

Source: Kinder- und Hausmärchen, *1st ed. (Berlin, 1812), v. 1, no. 26.*

The False Grandmother

France

Although this story was published later than both "Little Red Riding Hood" and "Little Red Cap," many elements in this story show it to have been an earlier version of the stories later edited and adapted by Charles Perrault and the Grimm Brothers. It was probably collected in the 1700s.

Once upon a time a girl was walking through the woods with a basket of goodies for her grandmother, when she met a wolf.

"Good day," said the wolf. "Where are you going so early in the morning?"

Now the girl did not know that the wolf was a wicked animal, so she told him that she was going to visit her grandmother, who lived on the other side of the woods. She continued merrily on her way. The wicked wolf ran on ahead and arrived at the grandmother's house before the girl. He crept inside, leaped on the poor grandmother, and ate her up, saving only a pitcher of blood and a piece of flesh. He then climbed into the grandmother's bed and waited for the girl. The girl soon arrived and knocked at the door.

"Just let yourself in," said the wolf, disguising his voice. "You must be hungry from your long walk through the woods. Do eat some of the meat that's on the kitchen table."

And the girl ate from her grandmother's flesh.

"You must be thirsty from your long walk through the woods. Do drink from the pitcher that's on the kitchen table."

And the girl drank from her grandmother's blood.

"You must be tired from your long walk through the woods. Do come to bed with me."

And the girl climbed into bed with the wolf.

She soon saw that it was not her grandmother in the bed with her, and she became frightened. Not knowing how else to escape, she said, "I have to go to the privy."

"You can just do it in the bed," answered the wicked wolf.

"I don't have to go little. I have to go big," said the girl.

"All right," said the wolf, "but hurry right back as soon as you are done."

The girl ran out of the house, and she ran past the privy, and she ran through the woods, and she did not stop until she was safely back at home.

Source: Retold from A. Millien, Mélusine, *v. 3 (1886–87), col. 428–29.*

Little Gold Cap

Ireland

As Little Red Riding Hood spread across Europe, storytellers in each country put their own twist on the tale. This story was first collected in the mid-1800s.

Once upon a time there was a little girl who had hair like midnight and blue eyes that sparkled like the stars. Her name was Lorna, and along with a loving mother and father, she had a grandmother who loved her very much. Grandmother had a wizened face and hair like snow. One day, her grandmother gave Lorna a beautiful golden and fire-colored wool cloak with a silver clasp.

"Wear this cloak, and it will always bring you good luck, Lorna, my dear," said Grandmother. "I made it from Midsummer sunshine, the most magical beams of all."

Lorna didn't know what that all meant, she only knew that her grandmother loved her. But the people in town knew. The old woman was well known as a "wise woman." If someone needed some good luck or needed a charm for love or rain, they would go to her. They all knew that the cloak had magic in its stitches.

One day Lorna's mother asked her to take her grandmother a loaf of soda bread and buttermilk and a piece of simnel cake for dessert.

"I think you're old enough to walk to your grandmother's cottage alone, but mind your manners and remember to ask her how she is doing. Say "please" and "thank you" if she offers you faerie cakes and tea. Don't dawdle on the way, and don't talk to people you don't know," said her mother.

"Yes, mum," said Lorna, and she set off, feeling very proud that her mother was letting her go at all.

Now her grandmother lived on the far side of a dark wood. It seemed a little scary, but Lorna tried to be brave. Then she heard a voice say, "Lorna, where are you going?"

Lorna turned to see a great black wolf stepping out of the shadows. The wolf licked his lips and thought of gobbling her up, but then he saw some farmers walking down the road. The wolf slipped back into the shadows once again.

"So you know my name, then," said Lorna.

"Yes, I know all about you, and your family," said the smooth-talking Wolf.

"Really? So you know my grandmother then, I'm going to visit her now," said Lorna.

"Oh really, is that the grandmother who lives in the village?" said Wolf.

"Oh no, my grandmother lives at the bend in the river, and I'm taking her bread and buttermilk and cake," said Lorna. She didn't know that it was bad luck to hear a wolf speak.

"Really," said Wolf, "well on the way, be sure to look at all the beautiful flowers along the way." And then he was gone.

Wolf took a shortcut through the woods to grandmother's house. He knocked on the door. Toc! Toc! Toc!

No answer.

He knocked harder. TOC! TOC! TOC!

Nothing.

So he stood on his hind legs, pushed the latch, and opened the door. When he sneaked inside, he saw that no one was home. The bed lay unmade with the nightcap sitting on the pillow.

"Hmmm, I had hoped to eat up grandma first, but now I have the most delightful plan," thought Wolf.

Wolf pulled all the blinds to darken the cottage and put on the nightcap and pulled the covers up to his chin.

When Lorna arrived and knocked on the door, a hoarse voice said "Come in."

"Grandmother, do you have a cold? I've brought you some treats," said Lorna.

"It's just a little cold," said Wolf, "but the light hurts my eyes. So come in and leave your basket and cloak on the table. Come closer so I can see you."

Lorna put her basket on the table, but she didn't take off her cloak. She kept the golden hood tight around her head. Something didn't feel just right. In the darkness, "grandmother" didn't look just right.

"Grandma, what big arms you have," said Lorna.

"All the better to hug you with, come closer," said Wolf.

Lorna inched a bit closer. "Grandma, what big ears you have," said Lorna.

"All the better to hear you with, Lorna. But I am getting old, and it is harder and harder to hear. Come closer."

Lorna inched closer. She got that prickly feeling on the back of her neck. Something was wrong. "Grandma, what big teeth you have," said Lorna.

"All the better to EAT you with!" yelled Wolf, and he jumped from the bed.

Lorna ducked her head, crying "Mama, Mama!"

As Wolf bit down, all he caught was the hood. But then he fell back into the bed, howling and shaking his head as if his mouth were on fire. It was that

Little Gold Cap

(continued)

gold and fire-colored hood that had burned his tongue right down Wolf's throat. That hood really was magic, and now Wolf was paying the price for his trickery.

Wolf, blinded by tears and his throat on fire, rolled off the bed and tried to find the door, howling as if all the dogs in the county were on his heels. Just then, Grandmother arrived, carrying her herb sack over her shoulder. Seeing the wolf, she grabbed a fire poker and beat the wolf as he ran out the door. She chased him into the river, where the fast current took the wolf out to sea.

Then Grandmother went back to the cottage and helped Lorna calm her nerves and have a cup of tea. "Well, now without my little golden hood, where would you be now, my darling? In the belly of the wolf, no doubt."

And then to restore heart and legs to the child, she made her eat a good piece of simnel cake and drink a good draught of tea. Then she walked Lorna home. They talked all the way, and Lorna promised that she would never again talk to a wolf.

Lorna kept her word, and never again did she talk to wolves. And her grandmother's magic stayed with her. When she grew old and passed away calmly in her bed, the cloak transformed her into a delicate yellow flower, the boulian. In good weather, you can see these flowers dancing in the fields by the road.

Source: Joanne Asala, Celtic Tales of the Strange *(New York: Sterling, 1997). Retold by Kevin Strauss.*

Jacquelyn Fallon

SECTION 3

Social Systems

Subjects:

sociology, biology

Approximate lesson time:

20–45 minutes

Materials:

two sheets of paper per student

Needs vs. Wants

Students distinguish between needs and wants and draw a concept map.

STUDENT OBJECTIVES:

At the end of this lesson, students will be able to:

1 Distinguish between things they need and things they want.
2. Identify how societal values are reflected in their actions.
3. Synthesize social influences that create attitudes about wolves.

VOCABULARY:

needs • wants • attitude • value • belief • action

TEACHER BACKGROUND:

Attitudes about wolves are ingrained deeply in people. From where do we gain our attitudes and values? This activity will help students reflect on the origins of their attitudes and values as well as the impact of their own attitudes and values.

At the base of all social systems are common human beliefs. A belief is a concept or idea accepted as truth by one person or a group. Most social systems (such as economics, politics, religion etc.) result from core beliefs that groups of people share. For example, we have an economic system because a large group of individuals in our society believe we should have a method to measure the exchange of goods and services. We formed our political system because a large group of individuals believe we should pass laws to maintain order in our society.

Social systems help define our values as a whole society. A value is a deeply held belief that guides a person's behavior or a group decision. Our economic system, laws and religions reflect our desire to guide individual behavior and group decisions about the way we should live. An attitude is a manner, disposition or feeling with regard to a person, topic or thing. Various groups attract individuals holding common beliefs, values and attitudes.

Attitudes About Wolves

Some of our impressions of wolves come from stories heard in childhood, such as *The Three Little Pigs*, *The Boy Who Cried Wolf* and, of course, *Little Red Riding Hood*... the same stories our parents heard when they were children. Let's analyze the belief system that was in place while creating a story like *The Three Little Pigs*.

Two pigs, who made their houses of straw or wood, represented those who fail to plan for tomorrow and fail to provide against the misfortunes of the world. These pigs were destroyed by the wolf. The third pig, however, planned ahead, was careful to plan and build with the most advanced


Daniel Cox, naturalexposures.com

National Science Education Standards

Unifying Concepts and Processes

Systems, order, and organization

Evidence, models, and explanation

Change, constancy, and measurement

Science in Personal and Social Perspectives (5–8)

Risks and benefits

Science in Personal and Social Perspectives (9–12)

Natural Resources

Environmental Quality

materials, and foiled the wolf. The story is not truly about wolves but about the virtues of planning ahead. The wolf is used as a metaphor for a big, dangerous world that challenges poor planners.

Human Language and the Wolf

Human language reflects how we think about the wolf:

- "Wolfing down food" indicates eating quickly until one is engorged.
- Being a "wolf in sheep's clothing" indicates an untrustworthy person.
- A person is said to "cry wolf" if they raise an alarm when there is no danger.
- In the Middle Ages, farming peasants called any threat or famine "wolf."
- In World War II, German submarine attack convoys were referred to as "wolf packs," and Hitler's retreat was "the wolf's lair."

Using such references and idioms demonstrates our assumptions about the world—and about wolves.

History of Human Attitudes Toward the Wolf

Some of the attitudes people have toward wolves may have originated when our Anglo-American ancestors' culture changed from hunter-gatherers to herders. The wolf was no longer a fellow hunter but a predator that could kill a flock of sheep in one night, potentially destroying a family's livelihood: food, shelter and clothing.

By the time North America was first being colonized, much of Europe had already exterminated wolves. The last wolf was killed in Scotland by 1743, and in Ireland by 1776. When Europeans immigrated to North America, they brought their beliefs and attitudes about the wolf with them. Consequently, many of the colonists took the same action against wolves here as their ancestors had taken toward wolves in Europe.

Young statesman John Adams wrote, "when colonists arrived, the whole continent was one dismal wilderness, the haunt of wolves, and more so of savage men. Now, the forests are removed, lands covered with fields of corn, orchards bending with fruit and the magnificent home... of civilized people."

The Extermination of the Wolf

President Teddy Roosevelt encouraged the extermination of wolves. The main method of mass extermination was poisoning. Carcasses of meat were laced with the poison strychnine and left out to lure wolves. The wolves would eat the meat and soon die. Scavenging animals such as coyotes, weasels and birds of prey also fed on the poisoned meat and died. Other methods of eliminating wolves included digging wolf pups out of their dens and strangling them, dousing wolves with kerosene and setting them on fire, and wiring wolves' jaws shut so they starved to death. In Montana during a 35-year period, 80,000 wolves were killed.

In 1974, the Endangered Species Act made it illegal to shoot or harm wolves, but that did not stop all killing of wolves. Some people participated in the "Three S" method of eliminating wolves: Shoot, Shovel and Shut Up, meaning that the person would shoot a wolf, bury it and not tell anyone about it.

The wolf and associated imagery are clearly present in our culture. Whether we are aware of it or not, our beliefs and attitudes spur our actions. Students don't often realize how their belief systems are reflected in their actions. This activity (1) helps students to think about things they desire and value in life and (2) challenges them to diagram how their actions, directly or indirectly, affect wolves.

ACTIVITIES:

PART ONE:

1. Ask the students to get out a blank sheet of paper.
2. On one side of the paper, they should make a list that answers the question: "What do you have to have in order to live?" Encourage the students to make a lengthy list—at least 50 items. Instruct the students to discuss what they have written down.
3. On the other side of the paper, they should draw a line that divides the page in half. Label one column, "Needs." Label the other column, "Wants."
4. Discuss with students the following distinction:
   need: an urgent necessity
   want: a desire
5. Tell students to rewrite each word on their list on the other side of the page, placing it in the correct column. Encourage students to be really honest in distinguishing between the items they really need and the ones they really want. *(If necessary, the teacher may require students to put half of their items on each list.)*
6. When they are ready, discuss the following:
   - How did you decide where to put each item?
   - How do you know if you need or want a thing?
   - Why do we want things?
7. Next, tell the students to consider the items on their "needs" list. How many of these could they really do without? Ask them to cross off things they think they could do without. They must cross off at least half of the items on their list.
8. Discuss:
   - What did you cross off? Why?
   - Was it hard to choose which things to cross off? Why?
   - How would needs and wants lists differ for people living in another country?
   - Where does family fit on your list? Religion? Wildlife?
   - If someone who did not know us came and read all of our needs lists, what conclusions would they draw about the values of our society?

Optional: Ask students to choose the most important three items from their needs list. Which three things could they absolutely not do without? Have students share their top three aloud.

PART TWO:

1. Ask students if their parents or other family members would have listed the same needs and wants. If not, why not? What needs and wants do they have in common with their families? Who and what else affect the needs and wants that are important to you?
2. Ask students to give examples of how their values affect their actions (it may be helpful to review the definition of *value* here). Students may need prompting: Do they value their personal health and therefore get regular exercise? Do they value justice and therefore participate in a student judicial committee? Do they value popularity and therefore dress like the "in" crowd? Do they value trees and a pretty environment and therefore recycle? Discuss as many examples as possible.
3. Direct students to get out another sheet of paper. Instruct them to write the word *me* in the center of the page. In the upper left side of the page, write the word *society* and in the lower right of the page write the word *wolves.* Using words, illustrations, arrows, boxes, etc., have students create a concept map illustrating the ways that the world affects them and how they affect wolves.
4. Discuss what the students have drawn.

ASSESSMENT:

Teacher may collect the needs/ wants page and the concept maps.

EXTENSIONS:

1. Distribute copies of some stakeholder position statements from Appendix III to the students. Have them identify statements or ideas that express wants that the group has and identify needs the group sees. What does this tell you about the values the group has?
2. Write these words on the board:

eagle	frog	rabbit
fish	bat	kitten
snake	deer	

   - Have each student write down the first word that pops into their mind for each of these words.
   - Collect answers aloud, and write responses next to words on the board.
   - Analyze responses. Positive versus negative, separate fact/ fiction.
     –Which words written represent positive attributes of the animal?
     –Which are negative?
   - Go through the lists once more, this time asking the harder questions:
     –Where do these opinions come from?
     –Are these opinions based on fact or fiction?
     –Are any attributes given to the animals human-given attributes?
3. Students may research words and expressions that use animal terms and see if they can understand the origins and/or meanings.
4. Students may research the historical examples of attitudes toward the wolf by reading newspaper articles of the past.

Jacquelyn Fallon

SECTION 3

Social Systems

Subjects:

geography, biology

Approximate lesson time:

1–2 hours

Materials:

For each group of students: one copy of the worksheet on page 48, colored pencils

Time Passes

Students draw a progressive map representing human land-use expansion and changes over time.

STUDENT OBJECTIVES:

At the end of this unit, the student should be able to:

1. Describe how habitat fragmentation influences wolf recolonization.
2. Explain the relationship between human development and the impact on wildlife.

VOCABULARY:

Habitat fragmentation • development

TEACHER BACKGROUND:

No threat to the wolf's long-term survival around the world is more serious than habitat loss. In the past two hundred years, much of what was uninterrupted wild land has become towns, neighborhoods and recreation areas so intensively changed by humans that they no longer support wildlife.

Today, the pace of development only accelerates. The twenty counties in the Greater Yellowstone Ecosystem are growing faster than any state in the country, faster even than Arizona and Florida. Private housing developments and commercial development of land for ski areas and oil and gas extraction continue to crowd wolves, elk and other wildlife.

Imagine being an elk spending your summer in Yellowstone National Park, then migrating to a nearby valley for the winter only to find that where last year's trees and grasses grew now stands a three-bedroom home on a fenced-in, 20-acre "ranchette"!

If 200 years ago we knew how fragmented and broken today's ecosystems would be, would we have developed our cities and towns differently? Would we have set aside more parks? Would we have used resources such as trees and water differently?

In this exercise, students make decisions about how to use land. Don't give away the ending, but really allow students to be stumped about what to do with the returning wolves, since that most closely replicates the situation many countries are in today.

ACTIVITIES:

1. Provide the worksheet and colored pencils to each group.
2. Read the students the following scenario, allowing time for students to draw on their worksheets at each step of the way. You may wish to recommend that students use different colors to indicate residences, cities, industrial areas etc.


Daniel Cox, naturalexposures.com

National Science Education Standards

Unifying Concepts and Processes

Systems, order, and organization

Evidence, models, and explanation

Change, constancy, and measurement

Evolution and equilibrium

Form and Function

Science as Inquiry

Abilities necessary to do scientific inquiry

Understanding about scientific inquiry

Life Science (5–8)

Structure and function in living systems

Regulation and behavior

Population and ecosystems

Diversity and adaptations of organisms

For more correlations, please see Appendix IV.

Time Passes Narrative

The landscape on the worksheet represents the land area in one imaginary county within the United States. It's a total of 1,496 square miles; each square on your worksheet represents one square mile. At the beginning of our story, the landscape consists of rolling hills with a few rivers and abundant wildlife. Native American people have lived in the region for generations, migrating from place to place following their seasonal traditions.

Draw onto your county two rivers. Both should begin and end beyond the borders of your map. Decide which direction the water is flowing. You may include one or two streams as tributaries to each of your rivers.

Time passes . . . Pablo and Miguel are two former gold prospectors who decide to settle down. They bring their families to the region and build ranches. They build fences to keep their cows contained and keep the wildlife out. On your map, build two ranches by filling in squares. Each ranch is 6 square miles in size. Position them wherever you like.

Time passes . . . Over the next decade, other settlers come to farm the land and graze their livestock. Soon, a city springs up. Build City 1 by filling in one square.

Time passes . . . The new settlers require water for their livestock and homes. Build a dam on one of your rivers. The water upstream fills in a lake, which takes up 14 squares. Draw this new reservoir on your map.

Time passes . . . The land prospers so much that soon a second community grows up in the region, and commerce joins agriculture as part of the economy of the region. City 1 expands. Fill in two additional squares adjacent to City 1. City 2 is founded; fill in two squares wherever you like. City 3 is founded; fill in two more squares in another location.

Time passes . . . Over the next decade, city folk, who make their money in city businesses, want to build country homes outside of town. Now, add rural residents to your landscape by filling in two different quarter-mile sections no closer than one square to any city.

Time passes . . . With all of the growth in the area, you need roads to handle all the travelers through the region. Draw in major roads to connect the major cities.

Time passes . . . More pioneers are attracted by the rich grasslands in the area and build homes and barns, fence off large areas of pasture land and begin raising cattle. Add two more ranches by filling in 26 square miles total area. (You may choose to have two 13-square-mile ranches, or one 10-mile-square and one 16-mile-square, as long as the total is 26 square miles.)

Time passes . . . With the growth in commerce and agriculture, a small crossroads grows into an incorporated town. Build a small town near an intersection of your roads by filling in one square.

Time passes . . . As settlers buy up land and use it for farming and ranching, the government decides to protect some of the prettier

Time Passes Narrative
(continued)

parts of the region for a park for everyone to enjoy. Establish a park by filling in 46 square miles.

Time passes . . . More city people wish to retire to the country to spend their golden years communing with nature. Add more rural residents by marking off four quarter-mile sections no closer than one square to a city.

Time passes . . . The region's convenient location right off a major highway makes it a regional center for commerce. A thriving city grows up. Add six squares to your existing City 1, add three squares to existing City 2, and add one square to your City 3.

Time passes . . . Increasing demand on the water supply in the region causes intense political and social controversy. To solve the problem, build another water reservoir by damming your other river. The backup of water occupies 46 square miles.

Time passes . . . Cattle prices go sky high as more Americans move to the "all beef" diet plan. Cattle ranchers in the area expand their operations. Mark off four more ranches—52 square miles total area (ranches may vary in size).

Time passes . . . With pressure from ranchers, bounty hunters extirpate wolves and other predators from the area.

Time passes . . . An entrepreneur decides that he can make lots of money taking visitors on horse trips through the countryside, so he decides to open up a horse camp. Add a horse riding camp by filling in 12 square miles.

Time passes . . . Corporate leaders decide that your region is a great place to manufacture a new line of pots and pans. They construct factories in your area. Build an industrial area by filling in two squares adjacent to one of your cities.

Time passes . . . All the corporate business means that business people need to get to and from the region on a regular basis. Business leaders ask the city to establish an airport. Build an airport that takes up 12 squares.

Time passes . . . With growing businesses in the area, small towns spring up. Add two new towns, one square each.

Time passes . . . Seeing the growth in the region, state highway officials upgrade gravel roads into paved highways. Draw in secondary roads to connect small towns with major roads.

Time passes . . . Corporate leaders and their families seek rural areas to build their country homes so they can escape city life. Mark off eight new quarter-mile sections no closer than one square to a town or any other residence.

Time passes . . . Investors come to the area looking for the next hot tourist attraction. They decide that a nearby range of mountains would be a great place to build a ski resort and conference center. Build a ski resort by filling in nine squares.

Time passes . . . Industry expands when a new factory is built that

Time Passes Narrative
(continued)

manufactures car parts. Add an industrial area by filling in three squares adjacent to a city that doesn't have the first industrial area.

Time passes . . . More industry means more jobs and more people moving to the area. As a result, cities grow. Add four squares to City 1, add one square to City 2, add three squares to City 3.

Time passes . . . More people means more congestion on the highways. The state highway department upgrades your main road. Your major road gets improved—it becomes an interstate highway (double lines).

Time passes . . . The BallMart Corporation decides that the region needs the largest selection of ball, nets and other sports equipment
in the state. Their "anchor store" soon becomes the beginning of the region's first outlet mall, complete with a food court and movie theater. Add an outlet mall by filling in four squares no closer than two squares to any city.

Time passes . . . Small towns continue to appear as businesses expand with the development of the mall, factories and ski resort. Add two small towns of one square each.

Time passes . . . The federal government decides that it can't let wolves disappear and initiates the "Species Survival Act" to protect wolves from trapping and hunting.

Time passes . . . More residents get tired of city life and buy land in the country. Mark off 12 quarter-mile sections no closer than one square to a town or another residence.

Time passes . . . A good economy and good jobs keep bringing people to the area. Cities continue to grow. City 1: add three squares, City 2: add two squares, City 3: add
two squares.

Time passes . . . With better roads and easier access to town, more residents move out to the country, but now they need more space to feel at home. Build a "ranchette" by marking off one two-mile section no closer than one square to a town.

Time passes . . . Factory orders continue to grow, and business leaders build even more production plants in the area to take advantage of a strong workforce. Expand an industrial area by marking off four squares adjacent to an existing industrial area.

Time passes . . . More residents seek "the good life" in the country. With land prices relatively low, they move out to the country. Add more rural residences by marking off four two-mile sections no closer than one square to a town or another rural residence.

Time passes . . . A political crisis in the Middle East forces oil prices through the roof. Now, it is economical to drill into natural gas reserves in your region. Set aside land for natural gas extraction by marking off 15 squares.

As part of the "Species Survival Act," wolves were reintroduced into areas much farther north and south of you. There is a chance that wolves could wander back into your county. Where are the places wolves should and should not be allowed to live in your county? What makes these places suitable? What barriers are there to wolves traveling through your county? Start thinking about which areas you think would be suitable for wolves.

Time passes . . . Small towns expand to provide housing for workers at factories and other businesses. Expand two of your existing small towns by adding one square each.

Time passes . . . A pack of wolves wander in from the north. Where are they likely to establish a territory? What needs will the wolves have? Mark off a 60-square-mile wolf pack territory.

Time Passes Narrative
(continued)

Time passes . . . As towns get crowded, more residents move out to the "fresh air" of the country. They quickly begin complaining about the smell from area farms and ranches. They also complain about the lights at the ski resort and conference center. Rural residents: mark off seven two-mile sections no closer than one square to a town, farm or other human-constructed feature.

Time passes . . . Towns continue to grow as small-business owners continue to grow the workforce. Add another small town by marking off two squares.

Time passes . . . The federal government gets worried that a natural disaster or sabotage attack on the natural gas field might endanger residents, so it sets up a buffer zone around the facility. Mark off all squares touching the natural gas field. No rural residences may be located within the gas field or buffer zone, so relocate rural residents as necessary.

Time passes . . . The highway department paves more roads to improve them and make it easier and safer to travel in the region. Make sure you have roads connecting small towns and other important landmarks to the major roads.

Time passes . . . The wolf population grows, and offspring begin to disperse and form new packs. Mark off another wolf territory: 75 square miles.

3. Discuss:
- Does your county have enough space for wolves? How many wolf pack territories do you have room for? How much human influence will your wolves have to tolerate?
- What challenges did you have as you incorporated the new developments?
- What do you wish you had done differently?
- Instruct students to adjoin their map edge to edge with another group's map. The two groups should discuss what would happen if these two counties were adjacent to each other in real life. What works/doesn't work about it?
- Make some predictions for the future. Based on past experience, what changes can you expect for the future? Consider human population growth, tourism and industrial development, increased demand on natural resources, increasing wolf population, and anything else you can think of. What problems do you foresee? What opportunities would you like to take advantage of?

ASSESSMENT:

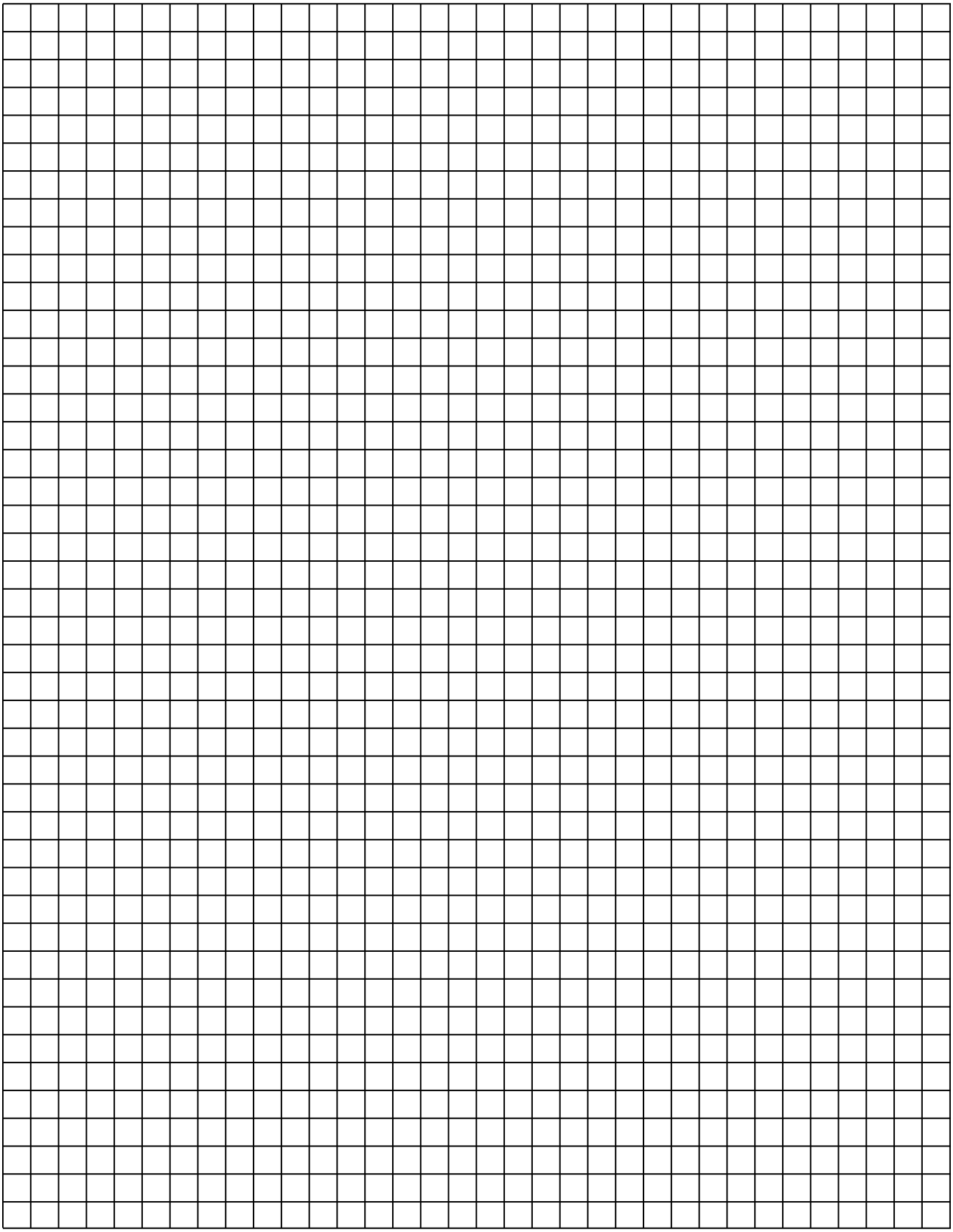
Assign students to reflect on the following questions:

- What laws could you make to expedite and/or limit future development?
- What barriers to recolonization will wolves find in your county?
- How would you have drawn in your cities, towns, roads, ski hill etc. differently if you had known what the end result would be?

EXTENSIONS:

1. Tape all the counties together to form one large map. Discuss.
2. Instruct students to devise a wolf management plan for their county. Then, instruct students to devise a wolf management plan for another group's county. Which is easier? Why?
3. Get out a map of your state. Discuss how this activity mirrors development there. Where could wolves live in your state?

COUNTY LAND MAP
for Time Passes Activity



Jacquelyn Fallon

Mary Had a Little Lamb

Students calculate income and expenses for a sheep ranch, then propose a solution to predator problems.

SECTION 3

Social Systems

Subjects:

math, reading, economics, science

Approximate lesson time:

Part one: 45 minutes

Part two: 1 hour

Materials:

calculator

copies of Mary HAD a Little Lamb case study, Counting Sheep worksheet, and Choices and Consequences worksheet

STUDENT OBJECTIVES:

At the end of this activity, the student should be able to:

- Calculate income and expenses associated with sheep ranching.
- Synthesize the relationship between costs and predator management decisions.
- Identify and defend a predator management solution.

VOCABULARY:

predator • depredation • grazing • allotment • live trap

TEACHER BACKGROUND:

Raising livestock in today's world is complex, requiring ranchers to be economists, veterinarians, businesspeople, wildlife biologists and more. The work is hard, and the pay is uncertain. Many people who operate ranches also manage other sideline businesses or even hold full-time jobs in town just to make ends meet. A full suite of predators such as bears, coyotes, mountain lions and wolves add another layer of complication to ranching.

Typically, a rancher owns a large number of female adult cows and/or sheep, who produce offspring once a year. The rancher feeds and cares for the young animals until they are old enough to sell at market, usually when they are between 120 and 130 pounds. Because the lambs will have different growth patterns, it will take from six to eight months to reach that weight and possibly longer depending on the year. The rancher keeps the adult animals and repeats the cycle every year. Sometimes the rancher will keep some of the young animals to replace retired breeders or to expand the reproductive capability of the herd or flock for the next year. The rancher may also sell the young before they are fully grown to another rancher, who will finish raising the animals until they are old enough to sell.

The practice of grazing livestock on public lands is controversial. Arguments for and against it stem from economic and environmental factors and value differences. On one hand, using public land to graze cattle is an economic necessity for some ranchers, allowing them to stay in business


Daniel Cox, naturalexposures.com

National Science Education Standards

Unifying Concepts and Process

Systems, order, and organization

Change, constancy, measurement

Science as Inquiry

Skills necessary to become an independent thinker about the natural world.

Dispositions to use skill, abilities, and attitudes associated with science

Life Science Grades 5–8

Populations and ecosystems

Diversity and adaptations of organisms

Life Science Grades 9–12

Interdependence of organisms

Matter, energy, and organisms in living systems

Behavior of organisms

For more correlations, please see Appendix IV.

and maintain a traditional lifestyle. Critics charge that livestock on public land degrade a public resource for the benefit of a few large ranch operations.

Although livestock producers face many challenges, wolves present special problems. Wolves are federally protected in many areas, which means a producer's options for responding to wolf problems are strictly limited. The U.S. Fish and Wildlife Service (USFWS) may be able to help prevent repeat losses in a specific location, but usually a producer must incur significant losses first before the USFWS will remove individual or packs of wolves. In some parts of wolf country, the U.S. Department of Agriculture (USDA) stations Wildlife Services agents, who may also be available to investigate claims and remove wolves. Despite the assistance of these government agencies, predator problems are difficult to prevent and generally cause the livestock producers in wolf country extreme financial and personal stress.

This activity puts students into the rancher's shoes, challenging them to balance many competing needs. Our hypothetical rancher's, Mary's, situation is fictitious but highly realistic. Part One gives students a glimpse of the economic challenges Mary faces by operating a multi-faceted ranch operation. Part Two asks students to decide how to deal with Mary's wolf depredation problems.

ACTIVITIES:

PART ONE:

1. Pose the following questions to students and invite them to guess answers:
   - How much does a sheep cost if you wanted to buy one?
   - How much wool can you get from a sheep when you shear it?
   - What kinds of expenses are involved in raising sheep?
   - How much money does a sheep rancher make in a year?
2. Read the "Mary HAD a little lamb . . ." page to the class.
3. Divide students into groups. Instruct students to work together to answer the questions on the Counting Sheep worksheet.
4. Discuss the following questions:
   - What is Mary's long-term financial forecast?
   - Will the number of sheep lost to predators continue increasing?
   - How many years do you think it will it take for Mary's income to drop below her expenses?
   - If Mary doesn't have savings, how will she pay her bills when her income drops below her expenses?
   - What factors might reduce Mary's losses?

PART TWO:

1. Ask students, "What do you think Mary should do about the predators on her ranch?"
2. Divide students into ten groups. Assign each group one of the Choices and Consequences cards. Each group should read their card and make a list of pros and cons of the method of predator management described

on their card. Instruct each group to estimate how much it will cost Mary to use this method of predator management for a year on her ranch. Each group should agree whether or not they would recommend that Mary use this method of predator management on her ranch.

3. Groups should assign a spokesperson and then report their findings to the class. Each group should report on the following topics:
   - describe your assigned method of predator management.
   - report the cost of using this method for one year.
   - explain why you do or do not recommend Mary use this method to manage predators on her ranch.
4. Together, the class should weigh all of Mary's choices and decide which method or methods are in her best interests to use. Students are welcome to recommend a variation of any of the methods or propose a completely new solution.

When the class comes to resolution, discuss the following questions:

- Based on your calculations from Part One, is this solution affordable for Mary?
- Mary is very busy with the routine care of her sheep. How much of Mary's time will this solution require?
- Which predators are the most difficult to deter?
- Of all the options for preventing or responding to predators, which is the most effective?

Note to the teacher: A panel of experts is available to answer questions students may have or evaluate a proposed solution. Send an e-mail to edudir@wolf.org to have your question or solution forwarded to the panel. The panel will answer your questions or review the class's proposed solution and pose questions back to the students with new perspectives.

ASSESSMENT:

Part One: Students should turn in their Counting Sheep worksheet.

Part Two: Students should write a paragraph summarizing why they agree or disagree with the class's proposed solution.

This lesson is reprinted through the courtesy of Bette Blinde and the Colorado Foundation for Agriculture, PO Box 10, Livermore, CO 80536, 970.881.2902, www.growingyour-future.com.

Additional Resources:

Colorado Foundation for Agriculture: www.growingyourfuture.com

American Sheep Industry Association: http://www.sheepusa.org/

Sheep Breeds Information: http://www.ansi.okstate.edu/breeds/sheep/

Mary HAD a little lamb . . .

This is the story of Mary, who owns a flock of sheep and is proud to be continuing her family's tradition of sheep ranching. Her flock has grown from 20 to 650 sheep. Mary owns 1,000 acres of land. She has divided the ranch into pastures so she can graze her sheep in different places at different times, known as rotational grazing. On 320 acres she raises hay to feed the sheep in the winter and to sell to people who own horses in the area. In summer she also leases public lands to graze her sheep. Her grazing allotment is in the national forest that borders her land and provides an important source of food for her sheep. For the past several years she has been working closely with forest service managers to use her sheep to help remove harmful weeds along the trails of these federal lands.

Predators such as coyotes, mountain lions, bears, wolves, eagles, foxes and bobcats inhabit the mountains around Mary's ranch. Down the road from Mary's ranch a new subdivision is under development. She suspects that dogs from the subdivision are forming packs and chasing her sheep. Many of the people who live in the subdivision moved out to the country so their dogs would have room to roam. Mary has built woven wire fences around her pastures, but an unknown animal dug holes under the fence to get into the pastures. In town the other day Mary heard that the wolves had killed two dogs and the owners were upset. She also suspects the wolves have killed some of the coyotes as she has found the remains of coyote near her lambing pasture. A few months ago Mary saw a bear with her cubs walking away from the pasture.

During lambing season in March and April, Mary protects her sheep by keeping the pregnant ewes and mothers with new lambs in a fenced area close to her house. Mary also owns one guard dog but decided to purchase another guard dog for $750 to help protect the sheep. She doesn't think the guard dogs will be able to defend the flock from the larger predators, but they can help prevent coyotes, dogs, bobcats, foxes and eagles from killing the sheep.

Despite the protective measures, Mary's sheep are being killed by predators. A couple of times a week when Mary checks on her flock, she finds one or two lying dead in the pasture. Sometimes the sheep are partially eaten, sometimes they are not eaten at all. On other occasions sheep are simply missing. This year, Mary lost nearly 20 percent of her newborn lambs and 5 percent of her ewes to predators. Five years ago she was losing 15 percent of her flock. Mary is concerned that she will lose her ranch because predators are killing so many sheep. She is 55 years old and has no other training or skills for other types of jobs. Mary wants to protect her sheep and do it with as little impact on local wildlife as possible.

How Mary deals with the predator problems differs depending on whether her sheep are on federal land or her own property. On federal land her options are restricted by laws protecting the predators and regulating how public lands are used.

NAME: _____

STUDENT WORKSHEET

COUNTING SHEEP

Instructions: Calculate the answers to the following questions. Don't forget to write down your equations and label your answers!

1. Mary's 650 ewes gave birth to 923 lambs this year. What is her lambing percentage?

2. If Mary loses 20 percent of her 923 lambs to predators this year, how many does she lose?

3. If Mary loses 5 percent of her ewes to predators, how many does she lose?

4. If the value of each lamb is $60, how much money has she lost?

5. If the value of each ewe is $80, how much money has she lost?

6. If Mary keeps 60 lambs to replace the older ewes or those killed by predators, how many of the lambs will she have available for sale?

7. How much will she receive for the sale of these lambs? At $90? At $60? At $40?

8. It costs Mary $1.35 per animal unit per month to lease a public lands allotment. Five head of sheep can be pastured for each animal unit. She rents this pasture for six months: May 1 through October 31 (figure costs based on 650 ewes and 785 lambs). What is the cost for renting the forest pasture?

9. She hires a sheepherder to stay with the flock throughout her forest allotment. For the six months the herder tends the sheep, he is paid $1,500 per month. Mary also furnishes his food and other extras that run $300 per month. What is the total cost for the herder?

10. A sheep eats 4 pounds of hay/grass per day. How much hay will Mary need to feed the sheep if for three months she feeds the sheep 4 pounds of hay per day and then for three months she feeds the sheep 2 pounds of hay and rotates the sheep in and out of pastures on her ranch? She is only feeding her ewes during these months, so use the figure of 650 ewes being fed hay and figure 31 days in each month. Hay is bought and sold by the ton (2,000 pounds), so figure your answers in tons.

11. Her 320 acres of hay averages 1.5 tons of hay to an acre. How many tons of hay does she raise?

12. Is this enough to feed her sheep?

13. How much extra does she have?

14. If she sells the extra hay for $80/ton, how much does she receive?

_____

15. Mary raises her own hay. She estimates her hay costs to be $40 a ton to cut, rake and bale. How much is her profit on the hay she sells?

_____

16. If she sold her hay for $90 a ton, how much would she receive?

What would be her profit?

_____

17. Mary also shears her ewes in May. Each ewe produces 8 pounds of wool that Mary sells for $.50 a pound. How many pounds of wool do her sheep produce?

_____

18. How much income will Mary receive for the wool?

_____

19. Mary hires a sheep shearer to shear the wool. The shearer charges Mary $2.50 per head to shear the sheep. How much does it cost to shear her sheep?

_____

20. Mary also has $5.00 per ewe per year for veterinary care. How much does she spend on veterinary care for her sheep per year?

_____

21. Mary must also feed and care for two guard dogs, which costs her $75 per dog month. How much does it cost Mary to keep her guard dogs for a year?

_____

22. Make a list of all of Mary's ranching costs. (Note: We assume here that Mary's ranch, equipment and sheep are paid for, as well as her health insurance, retirement savings, and other expenses.)

_____

23. Make a list of all of Mary's sources of income from her ranch. Figure that she received $40 for each lamb and $80 per ton for her extra hay.

_____

24. How much money does she earn on her ranch?

_____

25. How much more money would she make if the predators had not killed her sheep?

_____

ANSWER PAGE

1. 923 divided by 650 = 142 percent lambing percentage

2. 923 x .2 = 184 lambs lost

3. 650 x .05 = 32 ewes lost

4. 184 x 60 = $11,040 lost

5. 32 x 80 = $2,560 lost

6. 923 – 60 = 863 lambs left for sale

7. 863 x $90 = $77,670; 863 x $60 = $51,780; 863 x $40 = $34,520 for sale of lambs.

8. 650 + 785 = 1,435 total sheep; 1,435 divided by 5 = 287 animal units. 287 x $1.35 = $387.45 lease fees per month; $387.45 x 6 months = $2,324.70 total lease fees.

9. $1,500 + $300 = $1,800 expenses per month; 1,800 x 6 months = $10,800 total herder cost.

10. 650 ewes x 4 lbs/day = 2,600 lbs per day; 2,600 x (31 x 3 months) = 241,800 lbs hay

    650 ewes x 2 lbs/day = 1,300 lbs per day; 1,300 x (31 x 3 months) = 120,900 lbs hay

    241,800 lbs hay + 120,900 lbs hay = 362,700 total lbs. hay divided by 2,000 lbs = 181.35 tons hay

11. 320 x 1.5 = 480 tons of hay

12. Yes

13. 299 tons extra hay

14. 299 tons x $80 = $23,920 income from selling hay

15. 299 tons hay x $40 = $11,960 hay cost; $23,920 income - $11,960 cost = $11,960 profit on hay sales.

16. 299 x $90 = $26,910 hay income, $26,910 – $11,960 = $14,950 profit at higher price

17. 650 ewes x 8 lbs wool = 5,200 pounds of wool

18. 5,200 x $.50 = $2,600 income from wool

19. 650 ewes x $2.50 = $1,625 cost to shear

20. 650 ewes x 5 = $3,250 veterinary cost per year

21. 75 x 2 = $150 per month; 150 x 12 = $1,800

22. Grazing allotment $2,324.70
    Herder $10,800
    Hay cut, rake, bale $11,960
    Shearer $1,625
    Vet care $3,250
    Dog care $1,800
    TOTAL COSTS: $31,759.70

23. Sale of lambs $34,520
    Sale of hay $23,920
    Sale of wool $2,600
    TOTAL INCOME: $61,040

24. $61,040 – $31,759.70 = $29,280.30 take-home earnings

25. 184 lambs lost x $40 = $7,360 lamb earnings lost; 32 ewes lost x $80 = $2,560 ewe earnings lost; 7360 + 2,560 = $9,920 earnings lost to predators

CHOICES AND CONSEQUENCES

Mary would like to reduce the number of her sheep that are killed by predators. What can she do? All of her options include advantages and disadvantages, so she must choose which option will be the most effective while costing the least amount of time and money.

Below is one option Mary could use for solving the predator dilemma on her ranch. Read it over, and be prepared to

- describe this method of predator management to the class,
- estimate the cost of using this method for one year, and
- explain why you do or do not recommend Mary use this method to manage predators on her ranch.

Capture and Relocate

Mary could ask Wildlife Services to track down the predator so that it can be caught in a large live trap and relocated. Relocation requires the permission of state or federal wildlife agencies and may require special permits. Sometimes wildlife officials deny relocation requests. This method helps avoid injuring or killing the predator, allowing it to continue living its normal life in a new location. This is an especially valuable method when the predator population is very small because it maximizes the number of individuals remaining alive and reproducing in the wild. However, relocation can be very expensive and is not guaranteed to be successful. There seems to be a higher mortality rate among relocated animals than among the average animal population. People who live in the area where the problem predator is relocated may not want the predator brought into their area for fear it will harm their animals and property. Often times, relocated predators end up killing livestock again in the new place. Some predators can be difficult to trap and may return to their home area even after being relocated.

Costs: Wildlife Services might be able to help Mary at no cost to her. However, the wages, travel expenses and equipment must be paid for by the state or federal government using tax money paid by all citizens. How much does it cost the government if it takes one agent three trips to check the trap before the predator was captured, in addition to one trip to set the trap and one trip to remove the predator? Assume that the commute to the site is 50 miles one way, it takes one hour of drive time each way and two hours at the site per trip, and it costs $30 per hour in wages and $.50 per mile.

CHOICES AND CONSEQUENCES

Mary would like to reduce the number of her sheep that are killed by predators. What can she do? All of her options include advantages and disadvantages, so she must choose which option will be the most effective while costing the least amount of time and money.

Below is one option Mary could use for solving the predator dilemma on her ranch. Read it over, and be prepared to

- describe this method of predator management to the class,
- estimate the cost of using this method for one year, and
- explain why you do or do not recommend Mary use this method to manage predators on her ranch.

Harassing

Mary could try to discourage the predators with a scaring device. Radio-activated guard (RAG) boxes are experimental devices intended to deter predators from preying on livestock. Specifically, they are designed to work against animals that have been fitted with radio-tracking collars prior to being re-released into the wild (and, in the case of wolves, the packs of which they are members).

When the predator gets within a specified radius of the RAG box, its radio collar triggers a signal in the RAG box, and a series of bright lights flash and obnoxious sounds are emitted. Mary will have to place the device exactly where the predator would be entering the 650-acre pasture in order for it to work. Otherwise, she would need about five more RAG boxes to effectively cover the entire pasture perimeter. In the short run, RAG boxes can be effective scaring predators away so they don't kill livestock. However, some predators like coyotes and wolves easily become accustomed to scaring devices, so the boxes must be moved regularly. Scaring devices do not work very well with bears.

Costs: Each RAG box costs at least $3,500, and multiple RAG boxes are required to cover the perimeter on even a relatively small area of pasturage. The RAG box is best suited for smaller pastures or along known travel corridors of the wolves.

CHOICES AND CONSEQUENCES

Mary would like to reduce the number of her sheep that are killed by predators. What can she do? All of her options include advantages and disadvantages, so she must choose which option will be the most effective while costing the least amount of time and money.

Below is one option Mary could use for solving the predator dilemma on her ranch. Read it over, and be prepared to

- describe this method of predator management to the class,
- estimate the cost of using this method for one year, and
- explain why you do or do not recommend Mary use this method to manage predators on her ranch.

Excluding Predators

Mary could build stronger, better fences on her property to keep the predators out. Good electric fencing will stop most bears and wolves, but it is expensive to put up on larger tracts of land, and it has to be monitored regularly to make sure it is still working and no animals have become tangled in the wires. If Mary's sheep are being killed on her private property, she may be able to get financial assistance for fencing costs from the state's wildlife agency. This agency may have a program that helps livestock owners prevent damage, as a preferred alternative to paying for damages as they repeatedly occur. Because Mary grazes her sheep on private property, this assistance may be of some use to her. However, a fence is not helpful when she takes her sheep off her own property onto the public grazing grounds. In addition, coyotes and mountain lions can usually get through most types of fences.

Costs: A good predator-resistant fence would cost Mary about $6 per linear foot to build. If Mary were to enclose a square 320-acre pasture with such a fence, how much would it cost? (Note: 1 acre is 208.7 linear feet on each side.)

CHOICES AND CONSEQUENCES

Mary would like to reduce the number of her sheep that are killed by predators. What can she do? All of her options include advantages and disadvantages, so she must choose which option will be the most effective while costing the least amount of time and money.

Below is one option Mary could use for solving the predator dilemma on her ranch. Read it over, and be prepared to

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Shelter

Mary could put her sheep in a barn every night. This would protect them from most predators. Mary would have to build a much larger barn than she has now. To build a big barn would cost her $30 a square foot. She is concerned about enclosing the sheep in a barn because disease and parasites spread easily in large numbers of sheep confined together. It would be very labor intensive to herd the sheep into the barn each night, release them each morning and make sure they get to the correct pasture each day. Reducing the size of her flock so that they would fit in her existing barns more comfortably would make it impossible for Mary to earn a living from raising sheep.

Costs: Experts recommend that ewes with lambs be given at least 20 square feet of floor space each when confined to a barn or a shed for long periods. How many square feet of barn floor space would Mary need to house her 650 ewes after they lamb? If the barn cost her $30 a square foot to build, how much would the barn cost her? How does the total barn floor space compare to the floor space in your classroom?

CHOICES AND CONSEQUENCES

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Guard Animals

Mary could use guard dogs, llamas or donkeys to protect her herd. In many cases, guard animals can protect sheep against the smaller predators such as coyotes, dogs, bobcats, foxes and eagles. Guard animals require intensive training.

Costs: There are costs to purchase, feed and care for these animals. Buying a llama can cost between $3,000 to $4,000, and a donkey between $500 and $1,000. Guard dogs cost around $750. Assume $75 per month to feed and care for each guard animal.

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Shepherds

Mary could hire a shepherd to watch her sheep all year. She currently hires a shepherd to watch the sheep in the summer while they are on federal lands. The shepherd would be responsible for protecting the sheep at all hours but cannot, of course, be at all places on her ranch at all times. The presence of a human with the sheep is often enough to ward off a predator, but it is difficult to find someone willing to herd sheep because of the low pay and difficult working conditions. Trying to stop a bear or wolf attack in the dark is very dangerous! There are not many people experienced in herding and caring for sheep any more. She has been asking her sheep producer friends if they know of a shepherd she can hire for the winter months, but no one knows of anyone available.

Costs: $1,800–$2,500 per month.

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Leave Alone

Mary could just accept her losses and hope for the best. If the predators continue killing her sheep, Mary may have to consider another way of making a living besides raising sheep or other livestock. This means giving up a ranch that has belonged to her family for over 100 years. If she sells all her sheep, they are no longer Mary's responsibility to protect so her stress level is greatly reduced. Selling her land will most likely result in its conversion to houses, roads and businesses, which will destroy the habitat necessary not only for the predators but for many of the other native animals and plants that live there.

Costs: Mary will probably continue losing sheep if she does nothing. Mary will lose her income if she has to sell her property.

CHOICES AND CONSEQUENCES

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Shoot

Mary could shoot the predator. The law in her state allows Mary to kill a bear, coyote or mountain lion if she can prove it was killing her livestock. The law prohibits the shooting of wolves in her area.

The advantage of this method is that usually the offending animal is removed and the problems that animal was causing stop happening. However, finding and shooting a predator can be difficult, since bears, coyotes, wolves and mountain lions are usually most active at night. Furthermore, some people may be angry with Mary for shooting the predator because they believe that we should live with all wildlife—including predators. Mary may not own a firearm or be capable of killing a predator by herself. Mary also likes having predators on her property if they would just eat native foods and not kill her sheep. While it is legal for livestock owners to kill dogs caught killing or harassing livestock on their property, if the dogs belong to a neighbor, that action could strain relations with that neighbor.

Costs: The price of her bullets and her time spent hunting, possibly several days.

CHOICES AND CONSEQUENCES

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Trap

Mary could hire a professional trapper to shoot or capture the predator. An experienced trapper could catch the offending animal in a foot snare, but there is also the possibility that animals that are not threatening the sheep might be caught in the snare or trap as well. Often professional trappers are more successful at removing the predator than the rancher because they have more experience and training, but it is difficult to find professional trappers who can use traps and snares effectively. Some states have passed laws that limit when traps and snares can be used. Also, permits to use these methods on the ranch must be obtained from the state's wildlife agency. Predators snared because they have been killing livestock are usually shot. It is illegal in Mary's state to harm a wolf.

Cost: Trappers charge $30 per hour for their services. Assume that the job takes two hours to set the trap, three half-hour trips to check traps, and another hour to dispose of the captured animal.

CHOICES AND CONSEQUENCES

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Reimbursement

Mary could try to get paid back for the sheep that a predator kills. This option would not stop the problems from happening, but would compensate Mary for a loss if she can prove it was caused by a predator. Mary must report her dead sheep right away and hope that the investigating agents can inspect the scene within a day or two, otherwise scavengers may destroy the evidence. If the wildlife agent finds enough evidence that Mary's sheep was killed by a predator, then Mary can submit a claim to the state wildlife agency and ask to be reimbursed for the loss.

While reimbursements help Mary survive the economic losses that predators cause, these payments do not cover all of her losses. For example, if a predator kills Mary's guard dog, she may be reimbursed the purchase price of that dog, but not the money she spent feeding and caring for the dog nor the time she spent training the dog. Even if she gets the money to buy a new dog, she still must spend more time and money training the new dog.

Costs: The government bears the cost of investigating the incident and determining what caused the sheep's death. Mary's expenses include the time to complete the paperwork necessary to submit the claim and to assist the wildlife agent while he or she inspects the kill site.