



Jacquelyn Fallon

# Wolf Dollars & Sense

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

## 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*

### 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,

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 misidentified 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.



Daniel Cox, naturexposures.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*

**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:**

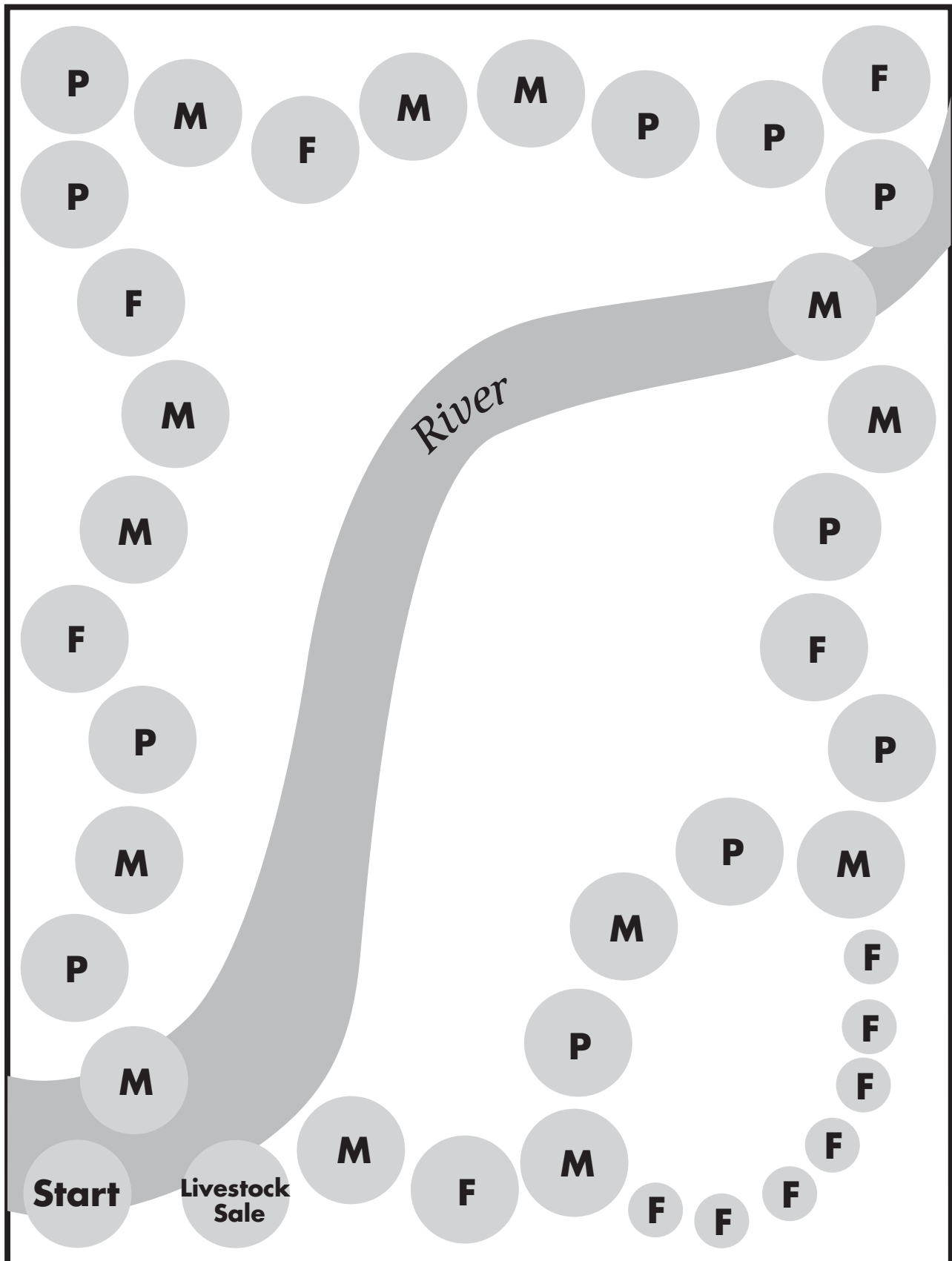
Rubric Assessment:

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







**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.



   
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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 \$1,500. 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 \$1,000 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.