GRAY WOLVES GRAY MATTER

Exploring the Social and Biological Issues of Wolf Survival

SECOND EDITION

A PUBLICATION OF THE INTERNATIONAL WOLF CENTER

International Wolf Center™
Teaching the World about Wolves

GRAY WOLVES

GRAY MATTER

Jacquelyn Fallon

Gray Wolves, Gray Matter

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Curriculum Editor: Andrea Lorek Strauss
Curriculum Writers: Erin Albers, Sue Knopp, Kari Loing, Andrea Lorek Strauss, Kevin Strauss, Carolyn Towler
Content Advisors: Dave Mech, Cornelia Hutt, Ed Bangs
Copy Editor: Mary Keirstead
Graphic Designer: Tricia Austin

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Michael Ruzich, Sandburg Middle School, Elmhurst, IL
Andy Weaver, Stillwater High School, Stillwater, MN

International Wolf Center

Educational Services
1396 Highway 169
Ely, MN 55731
218-365-HOWL • www.wolf.org

The International Wolf Center advances the survival of wolf populations by teaching about wolves, their relationship to wild lands and the human role in their future.

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Chris Darimont


Jacquelyn Fallon


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Foreword

A wild wolf trots out of the woods into a clearing.
It doesn't see you as it crosses...

a prairie meadow

your cattle pasture

a wilderness trail

the playground at the edge of town

a logging road in the forest

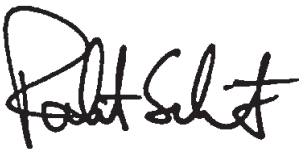
or your back yard

How do you react?

The wolf evokes feelings of excitement and fear, wonder, anger and allure. Looking into the eyes of a wild animal blows open the doors of a student's imagination and sparks the mind with curiosity. As this curriculum fuels the fire with biological, cultural and political perspectives, it takes students beyond emotion and challenges their thinking about the wolf and its complex relationship with humans.

The world's top wolf researchers have gathered the information you will present in these exercises. With that expertise in hand, your students are about to enter a real-world debate taking place in the wolf-populated and wolf-barren areas of Yellowstone National Park, New Mexico, France, Finland, Russia and elsewhere around the world.

Will the controversial wolf lope across our future landscape? Your students will gather facts, write, talk and listen, explore outcomes, resolve conflict and then decide.



Robert Schultz
Executive Director
International Wolf Center

September 1, 2018

How to use this curriculum

The International Wolf Center is proud to provide educators with a resource that goes beyond biology to analyze the human aspects of the wolf's survival. This curriculum helps educators of all types address a true environmental controversy in a holistic, objective manner. Wolves are a complex subject to study, encompassing multiple disciplines and issues. The materials provided will help you and your students make sense of this multifaceted subject.

Even the name of this curriculum, *Gray Wolves, Gray Matter*, reflects the complexity of wolf issues. The phrase *gray matter* has dual meaning. First, it refers to the gray areas between fact and fiction, right and wrong. Second, gray matter is a metaphor for the brain, meaning that intensive thinking will be required to find compromise on these complicated issues.

Within these pages you will find a wealth of resources for teaching about the wolf and the current controversies surrounding their survival, including background information for teachers, interdisciplinary activities, assessment recommendations and student worksheets and game pieces. This activity guide is composed of a series of lessons that may be used together in sequence as one unit or used piecemeal to supplement an existing unit of study. The project is geared to students in grades 6–12, but no specific grade level is recommended for any of the lessons because they can all be adapted for learners of any age.

The activities are grouped into five themes:

The Wolf: The natural history of wolves, including pack life and survival needs

Natural Systems: The wolf's relationship with its ecosystem, including predation and territorial behavior

Social Systems: The cultural and economic interactions between wolves and humans

Wildlife Management: Understanding the mechanisms humans use to influence wildlife populations

Finding Solutions: Personal and civic skills necessary to find peaceful coexistence with wolves.

Not only has this curriculum been classroom tested, but it has also been reviewed by a variety of stakeholders in the wolf management controversy. These people, who fall on different sides of the wolf issue, made suggestions that were incorporated to ensure the greatest objectivity possible. In addition, all material was approved by world authorities on wolves, wolf ecology and wolf management. The International Wolf Center's goal is to provide the most current, scientific, unbiased information available so that people can formulate their own opinions about wolves and wolf management.

The International Wolf Center is committed to supporting wolf educators. Visit our extensive Web site, www.wolf.org, where you'll find a host of information and opportunities!

LEARN: Accurate information and activities including volumes of wolf facts, curricula, loan boxes, Just for Kids section, outreach program information, Educator section (with our teacher workshop schedule) and more!

EXPERIENCE: Join us for the adventure program of a lifetime. Monitor our Wolf Watch Web Cam, or track wild wolves like the researchers do.

SHOP: An educator's dream site for purchasing books, audiovisual materials, wolf adoption kits, track packs, wolf curricula and more.

JOIN: Join the pack and receive the world's foremost magazine on wolves four times a year.

NEWS & EVENTS: Check out the hottest wolf issues in the news, and peruse archived issues of *International Wolf* magazine.

Also on our Web site, you'll find an online curriculum at **http://www.wolf.org/wolves/learn/educator/gwgm/gwgm_main.asp.** This curriculum is presented in cooperation with the University of California, Berkeley, which has developed an educational program called Web-based Integrated Science Environments (WISE). Online, you will find a workbook-style project with a progression of student readings and dialogue boxes for students to take notes and save their work online. Students follow selected links to delve into the background of wolf management and then organize their reflections using online organization tools. The WISE curriculum is organized along the same five themes as this activity guide.

Teaching about wolves can seem overwhelming, but the rewards are great. The wolf is a charismatic subject, often sparking motivation in even the most challenged learner. By encompassing a variety of subjects and issues, wolves require students to use a variety of skills and approaches to understand them, thus serving as an ideal subject of interdisciplinary study.

In 1978, Barry Lopez wrote in his book *Of Wolves and Men*, "The truth is we know little about the wolf. What we know a good deal more about is what we imagine the wolf to be." This curriculum helps your students explore both the facts and imaginings about wolves. Through their investigations, students will gain new insights into the relationship between humans and the environment and begin to appreciate the important role they play in the wolf's future.

What is wolf management, anyway?

Humans interact with wildlife in many ways. Many people like to photograph wild animals. Others hunt them for both survival and sport. We even name our athletic teams after animals that have strength, speed or charisma. Although the relationship between humans and animals continues to evolve, wildlife never fails to engage our interest and to arouse our curiosity.

This section provides you with a foundation for the lessons in the activity guide. Included is information about wildlife management in the United States along with definitions of key words and phrases with which your students should become familiar. If you need more information, local wildlife management agencies can help.

What Is Management?

When the United States was founded, the early settlers had a very utilitarian approach to the natural resources they found here. Plants and animals were so abundant that the settlers made use of them in whatever ways they could. People exploited species, such as beaver and egrets, that were valuable to them for fur, feathers, medicinal value and other properties. Other species, like the wolf, were eradicated because they competed with humans for resources. Little thought was given to long-term planning for sustainability.

As time passed and more people "settled" the country, concern for our dwindling natural resources grew. People began to observe changes in wildlife populations and to pass laws to regulate how wildlife should be treated.

Today, wildlife management is a common practice. Defined, wildlife management is the application of scientific knowledge and technical skills to influence animals' habitat, behavior and abundance. For example, humans often manipulate the living conditions of various fish in order to create a bountiful harvest for fishermen. Wildlife management decisions reflect our values.

Wildlife Management Practices

In the United States, each state typically has jurisdiction over the plants and animals within it. States usually have an agency such as a Department of Natural Resources or a Department of Fish and Game that is charged with the task of overseeing the health and well-being of wildlife populations in their state. Scientists and technicians employed by these agencies combine the best available information with awareness of their state's ecosystems to make and carry out decisions that will ensure the long-term viability of the plants and animals in their state. The federal government has jurisdiction over birds, especially waterfowl that migrate across state boundaries, endangered species, and marine mammals.

Some species are considered desirable, so their populations are nurtured to benefit humans. Other species are considered a nuisance, or "vermin," and their populations are minimized to limit their impact on humans.

To influence an animal's habitat, behavior, or abundance, wildlife managers may use any of the following methods:

- **protection:** passing state or federal laws that make any injury to the species a crime
- **regulated harvest:** issuing a controlled number of permits or licenses to hunt or fish a certain species
- **seasons:** establishing certain times of year people may hunt or fish the species in order to maximize reproduction of the species

• **bag limits:** setting a maximum number of animals that may be caught within specified time limits

• **size limits:** setting a maximum or minimum weight or length of a species, usually fish, that may be caught in order to protect smaller or larger individual animals

• **population monitoring:** estimating the overall size of the species' population either directly by counting individual animals, or indirectly by locating scats, tracks, nests and so on.

• **habitat analysis:** collecting data about key habitat elements

• **habitat protection:** passing state or federal laws that preserve key food, water, shelter or space for the target species

• **habitat improvement:** adding or improving key food, water, shelter or space components

• **habitat removal:** removing, destroying or erecting barriers to food, water, shelter or space

• **control:** removing individual animals of a certain species

• **contraception:** limiting reproduction of a species to minimize population growth

• **education:** providing information to the public about wildlife habits and needs

Many of these wildlife management activities can be carried out on public lands over which the wildlife management agency has jurisdiction. However, many public lands comprise only a patchwork of areas with habitat for native species. Many wildlife management agencies are moving toward an ecosystem management approach to provide larger networks of high-quality habitat. In this model, public officials bring together private landowners with state and federal officials to work together to preserve and improve habitat.

A Management Plan

Most wildlife species are under the jurisdiction of state wildlife agencies that employ trained biologists to formulate and carry out a plan for the management of a species. Migratory species such as songbirds and waterfowl are managed by federal wildlife officials because they cross state or national boundaries.

Wildlife managers determine which wildlife management techniques to use by developing management plans that outline the needs and outcomes they desire for a given species. They will identify the basic habitat needs of the animal in question (food, water, shelter, space), determine the density or sometimes the number of animals that will be considered an optimal population level, and identify any limiting factors that are keeping the species from maintaining the desired population level, including how human activity could bring about increases (or in some cases, decreases) in the species population. They then create a plan using the techniques above that is designed to maintain the target species at the desired population level or in the desired range. They must always keep in mind that actions that benefit one species may have a negative effect on another species, and that an animal's needs may vary as time passes and ecosystems change.

A management plan usually includes details about when, where and for how long any management strategies will be used. For example, Minnesota's Department of Natural Resources (DNR) has included several techniques in their management plan for black bears in the state. In northeastern Minnesota, bears are hunted by permit during a short season in the fall. In western and southern Minnesota (regions where the DNR would like to exclude black bears), permits are not required, and limits are not imposed on bear hunting during the hunting season. The DNR also manages bears by providing quality bear habitat through a variety of forestry practices, supporting research to improve understanding of bear behavior and needs, providing information to the public about how to live with bears, and limiting the bear population with hunting seasons.

Biologists usually seek public input when preparing management plans. Citizens may attend public hearings held by wildlife agencies or participate in special interest groups who try to influence the planning process. Wildlife management plans often must undergo a rigorous approval process within the wildlife agency or the legislature, depending on prevailing laws.

Across the United States a wide variety of wildlife management activities take place. Wetlands are protected to provide habitat for waterfowl. Population surveys determine whether lynx and boreal owls are permanent residents or temporary visitors, and black spruce stand preservation favors boreal owl nesting. Highway reflectors frighten white-tailed deer in areas where deer frequently get hit by automobiles, and population census information helps regulate the deer harvest each year. Lake stocking, dams that control water levels, and erosion management benefit walleyes by preserving clean water. Prescribed burns maintain sharp-tailed grouse dancing grounds. Travel corridors benefit solitary species such as fishers and martens. Coyotes and crows, on the other hand, often receive very little management, as they are considered "vermin" species.

Special Cases

In some cases, a wildlife species' population may drop to dangerously low numbers, and wildlife specialists must take action to prevent that species from being extirpated (removed from an entire area within its range but not from the entire planet) or going extinct. Refer to the Teacher Background information in "Back from the Brink" for more information about extirpation and extinction.

The Endangered Species Act is a federal law passed in 1973 that protects plants and animals from becoming extinct in this country. When a species is placed on the endangered species list, the federal government (through the U.S. Fish and Wildlife Service [USFWS]) supersedes the state's authority to manage that species. The USFWS develops a comprehensive management plan for the species in danger and establishes penalties for harm done to that species.

There are other species, prairie dogs and blackbirds, for example, that have such abundant populations that they are considered a nuisance by some humans. In parts of the western United States, the federal government has a program to remove prairie dogs because they compete for forage with livestock. In other areas, blackbirds are controlled because they cause so much damage to agricultural crops.

There are many species that have very healthy population levels and do not require special attention from wildlife managers. Although they may benefit indirectly from the management of other species, most states do not take any specific management action for animals such as woodchucks, porcupines, chipmunks, opossums, mice, skunks or weasels.

Ecosystem Management

It is important to remember that simply by sharing the earth with animals, plants and other natural resources, humans have a significant impact on them, either intentionally or unintentionally. We manage forests, land, air, minerals and wildlife to accommodate our needs and values. We manage land by setting it aside for cutting timber or creating a wildlife refuge, for example. We manage our air and water through legislation regulating pollution.

Some of the resources we manage are renewable, meaning they will naturally regenerate under favorable conditions. Forests and wildlife can replenish themselves (if you cut a tree, a seedling will replace it) and are considered renewable resources. If you catch a fish or shoot a duck, their populations will naturally replace the ones you take. Renewable resources are managed for a sustained yield. Certain resources, such as oil and minerals, are nonrenewable, will not regenerate in this geological age, and therefore require special management.

Keeping renewable resources at healthy population levels requires extensive understanding of ecology and the workings of the earth's natural systems. If managers are to achieve a sustained yield of wildlife populations, they must take into account issues of natural mortality, predator-prey relationships, plant types, ages, densities and even weather patterns.

For example, if managers allow humans to shoot enough elk, then fewer elk will die of starvation the next winter. In this case, human harvesting takes the place of mortality that would have occurred naturally. The ecosystem can support a limited number of elk (carrying capacity), and when the population exceeds the capacity, they will overgraze their food source and eventually starve. Plants work the same way. When you have too many plants in a pot, you can weed some out, and all the rest will grow better.

In the course of wildlife management decision making, occasionally there is tension between a concern for the well-being of individual animals and a focus on the good of the entire population. Most managers focus on the long-term benefit of the entire population because natural mortality causes a high turnover in the individuals of many wildlife species. For example, about 75 percent of cottontail rabbits alive today will be dead in a year due to natural turnover. The choice between benefiting a population or benefiting an individual animal can sometimes be a source of management controversy.

Wolf Management

What is the wolf's place in the world of wildlife management? Wolves have been controversial in recent years, and many people have strong opinions about issues surrounding their management. In the past few decades, wolf populations in the United States have been growing, and people are experiencing increased encounters, both positive and negative, with wolves. Some people feel that if wolves are simply left alone, then wolves will be fine; other people feel we already have too many wolves and that their numbers should be limited.

Reasons why people argue for wolf management:

Wolves are federally protected.

In 1974 the gray wolf was protected by the Endangered Species Act of 1973. Because of this protection, their numbers have grown in the western Great Lakes. In parts of the Northern Rocky Mountains and parts of New Mexico and Arizona, wolves have been reintroduced. In some parts of the United States wolves have met or exceeded population goals originally set by a wolf recovery team, and the species will eventually be reclassified at some point in the future. When the wolf is removed from the endangered species list, each state in the region that contains wolf populations will resume management of the species and will continue experimenting with various methods of wolf-human coexistence.

Wolves compete with humans by killing their livestock and their pets.

Although livestock such as sheep and cows are not natural food sources for wolves, it is becoming more common for wolves to kill these animals in wolf range. In 2002, wolves killed at least 200 cows and 164 sheep in the lower 48 states. Every animal that wolves kill means less income for the owner of the livestock. Additionally, wolves sometimes kill domestic pets, especially dogs, which can be both a financial and personal loss to their owners. Owners of livestock killed by wolves can apply for a reimbursement for the lost animal, but those payments don't always cover the true value of the lost animal.

The wolf population is increasing, so problems caused by wolves will increase.

Wolf populations were at their lowest in the lower 48 states in the early 1960s, when there were about 650 wolves in the northeast corner of Minnesota. At the time of publication, wolf

populations are estimated to be around 4,737 in the lower 48 states. As the population grows, so does wolf range. That means that wolves are wandering into new areas and setting up territories in places that haven't supported wolves for decades. These areas have changed since wolves last inhabited them. Today there are livestock pastures, towns, crops and homes. The farther south wolves move, the more sheep, cows and horses they will likely kill. Wolves may also kill more dogs if they move into areas more heavily populated by humans.

Some people think wolves compete with humans for deer, moose and elk.

As described above, humans manage elk and other wolf prey for recreational or subsistence hunting. Many believe that the growing wolf population causes the prey population to decline, which in turn makes hunting less successful. Long-term research shows that many factors influence prey availability, including weather, multiple predator species and human hunters. In general, the wolf population tends to follow the fluctuations in the prey population. Because many people believe that more wolves lead to fewer deer, moose and elk, management of all these species may help ensure sustainable populations and placate concerned hunters.

Many people are afraid of wolves.

Although wolf attacks on humans are extremely rare, many people still fear the possibility of encountering a wolf. Healthy, wild wolves have killed humans in other parts of the world in recent years. Other wild animals such as bears, mountain lions, bison and moose have also killed people, and wolves are large, unpredictable predators.

Wolves are sometimes dangerous to people.

As the wolf population grows, and as wolves move into more populated areas, the chances for negative encounters with wolves grow. Recent studies have determined that wolves that lose their fear of humans are the most likely to approach humans and pose a threat. Education can help decrease the possibility that such a negative event will occur.

Some people like to hunt and trap wolves.

In the same way some people enjoy sport hunting of other species, there are people who would enjoy the opportunity to hunt and trap wolves for sport and profit. While wolves remain protected, hunting is not allowed. As their numbers grow and protections are lifted, sport hunting could become an option.

Some people like and admire the wolf. Other people dislike the wolf.

Discussions about wolves and their management will continue for years because there are such strong and divergent viewpoints about them. Some wolf management decisions might satisfy only certain parties interested in wolves; other decisions could anger everyone.

What Now?

Most people agree that it does not make sense to eradicate all wolves from the earth. Despite that, the question remains: how many wolves and in what places will satisfy the most number of people? Because the United States is a democracy, we enjoy the benefit of a public process. Citizens provide input to management decisions, and wildlife managers use their best judgment to satisfy all parties—including the best interests of wildlife. Through education about the many facets of wolf management, citizens can become informed participants in the planning process.

Wildlife management is a complex practice involving many disciplines. This curriculum endeavors to reveal the issues and opportunities we face as we try to bring people together to understand the wolf and our human impact on its future.