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# Spoons Game

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## How to Play Spoons

**Spoons** (adapted from source 1) is a clever card game that can be played by children and adults. This card game also goes by the names **Pig** and **Tongue**. Despite the name, spoons are not necessary to play those versions of the game. This fun family game can accommodate a large number of players.

**Players** - Four on each team

**Cards** - A standard 52-card deck - for this version, one deck is enough cards for 12 students.

**Setup:** For each player in the game, you need four cards of the same rank from the deck. For example, with 4 players, you could use the Aces, 2s, 3s, and 4s.

**To play the Spoons version, you also need one spoon for each player except one.**  
*Example: With 4 players, you need 3 spoons. For **Pig** and **Tongue**, no extra equipment is needed.*

**Goal:** The goal of the game is to be the first to collect four cards of the same rank. If an opponent beats you to that goal, try not to be the last to realize it.

*Shuffle the cards, and deal them to the players. Each player will have four cards. If you're playing **Spoons**, put the spoons in the middle of the table, so every player can reach them.*

**Gameplay:** Players simultaneously choose one card from their hands, pass that card to the opponent on their left, and pick up the card they've received from the opponent on their right. No player can have more than four cards in his hand, so it's illegal for a player to pick up a new card before passing one to the left. When a player collects four of a kind, he/she does one of the following actions, depending on which version of the game is being played:

**Spoons:** As subtly as possible, take a spoon and place it in front of yourself.

**Pig:** Quietly place a finger on the tip of your nose.

**Tongue:** Quietly, but visibly, stick out your tongue.

When one player does this, every other player must do likewise as quickly as possible. The last player to grab a spoon, touch his nose, or stick out his tongue is the loser.

**Optional:** While playing **Spoons** or **Tongue**, players who either take a spoon or stick out their tongue can continue to pick up and pass cards, making it more difficult for other players to realize what has happened. The player who collects four cards of the same rank must always pass the card they just picked up because passing any other card would break up their four-of-a-kind. This option is not available when playing **Pig** since one of your hands will be occupied with touching your nose.

**Winning the Round:** The last player to grab a spoon, touch their nose, or stick out their tongue is the person to take a card from the vocabulary pile. Once the card is read and repeated by the rest of the students, shuffle the deck of cards, and play again. Continue playing until you have been through all eight of the vocabulary cards.



# Vocabulary Cards

Natural Resources

Resource

Use

Manage

Develop

Care

Property

Stewardship



# Vocabulary Cards

|   |   |
|---|---|
| <p>a place or thing that provides something useful</p>  | <p>sources of life, materials, or energy that we are able to get naturally from the earth</p> |
| <p>be in charge of, run, be head of, head, direct, control, preside over, lead, govern, rule, command, supervise, oversee, administer, organize, conduct, handle, guide</p> | <p>the way in which land can be interacted with based on regulations</p>                      |
| <p>providing for something in a positive way</p>  | <p>to aid in growth, maturation, or expansion</p>   |
| <p>As Wyoming citizens, we are stewards entrusted with the responsible development, care, and use of our resources to benefit current and future generations.</p>           | <p>land mass of varying size</p>  |



# Vocabulary

Name: \_\_\_\_\_

| <u>Word</u> | <u>Definition</u> | <u>Picture</u> |
|-------------|-------------------|----------------|
|             |                   |                |





?????

Mystery Steward



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## Practice Text

### Girls' decoy grouse lure birds from drilling-rig noise

· July 28, 2015  
*Angus M. Thuermer Jr.*

PINEDALE – Two 8th-grade students advanced greater sage grouse science this spring by making dummy strutting males to lure birds from a nearby drilling rig so they could better hear mating calls.

Under the guidance of Wyoming Game and Fish Department biologist Therese Hartman, Maggie Majhanovich and Nora Legerski made 16 paper mache decoys, resplendent in their puffed-up strutting glory with white chests and splayed tail feathers.



Five grouse strut around two paper mache decoys (center) made by Pinedale Middle School students Nora Legerski and Maggie Majhanovich. Trail-cam photographs and observations show that, for the first time, biologists have been able to coax grouse from a real to an artificial lek. (courtesy Wyoming Game and Fish Department)

In the spring, they took the decoys to a lek, a clearing in the sagebrush where greater sage grouse strut, court, cluck and mate. A drilling rig had moved into the neighborhood and its noise was overwhelming the low-volume courtship calls and noises.

“The oilfield is real loud and it’s hard for them to hear,” Nora said. If they could make a fake lek, Maggie said, maybe the grouse would move their breeding ceremony farther from the rig where they could hear better.

The goal is to bolster the population that’s dwindling around the Pinedale Anticline gas field. The species is in trouble nationwide and warrants protection under the Endangered Species Act.

“The grouse had been leaving because they can’t hear,” Nora said. “By moving the lek ... it would help.”

Without a lek, “they won’t reproduce,” Maggie said. “Then they’ll go extinct.”

“All our studies indicate the leks within a mile of the drilling activity are declining,” biologist Hartman said. “One lek we’re trying to salvage had over 200 birds on it. It’s down in the 40s now. To respond to that, in order to try to keep the birds on the



## Practice Text

landscape, we're coming up with any kind of crazy idea we can." "We always like to include students when we can," Hartman said of Game and Fish work. She went to Pinedale Middle School science teacher Aretta Hudlow who nominated the pair. An art teacher helped with supplies and techniques.

Two peas in a pod, the 13-year-old eighth-grade neighbors have been buddies since kindergarten. They've worked on their project since February. They're such close friends they sometimes finish one another's sentences.

Although they worked with chicken wire, paper mache, paint and other arts-and-crafts supplies from an eighth-grade classroom, the girls' work is groundbreaking.



Creating fake grouse (courtesy of the Wyoming Game and Fish)

"The idea is to get [grouse] to stay in the gas field until the drilling is done," Hartman said. When noisy drilling is replaced with quieter, less intrusive production pumps and tanks, the hope is grouse will "go back to business as usual."

"It's a lot of hard work," Nora said. "You had to be organized. You had to be done with paper mache by this date, paint by this time, get them out there."

Finally, they went out to the artificial clearings, drove stakes into the ground and wired the grouse down. Hartman and her colleagues set up the sound systems and programmed them to play for a couple of hours at dawn.

"We'd go out early in the morning before school or on Sundays," Maggie said. "We'd watch from the cars with the binoculars, spotting scopes."

The scientists began to record their observations.

"You start on one end and count and then go back the other way," Maggie said. "You'd see some of them running, some of them hanging out."

Nora marveled at the males' displays. "You could see them puff up," she said. "It was fun to see them strutting around."

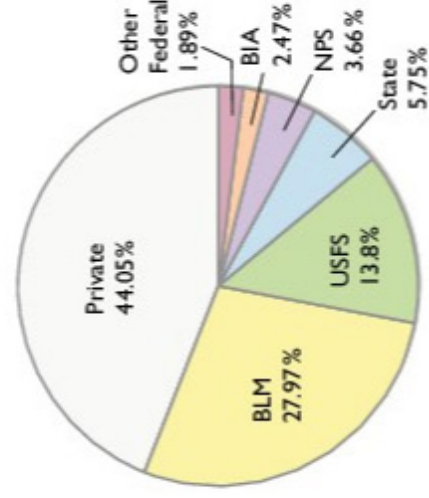
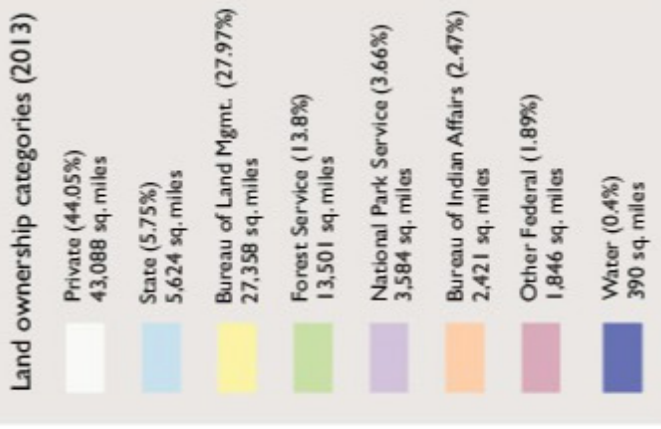
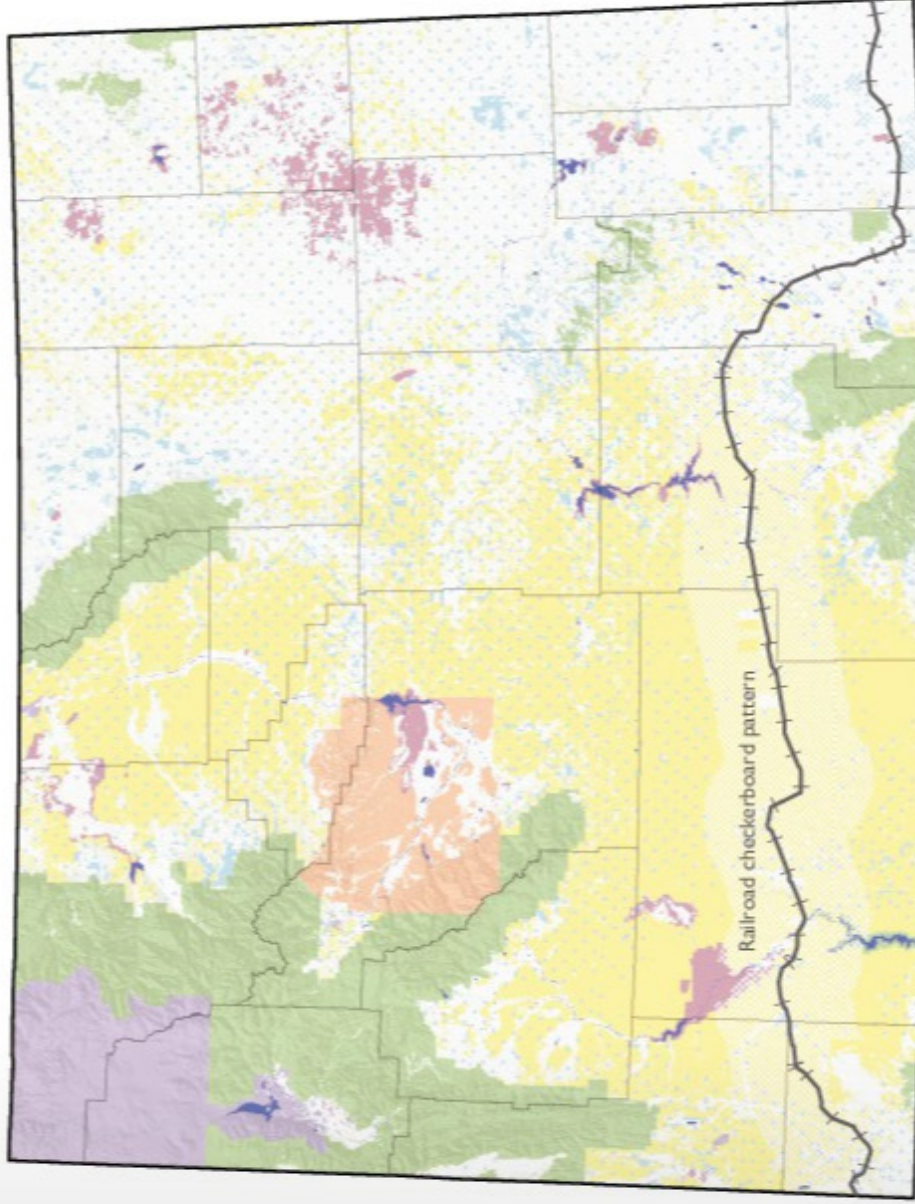
The decoys worked. During the four or five early morning visits to the Lower Sand Springs leks, Maggie and Nora saw eight males on each of the artificial clearings.

Article adapted and reprinted from WyoFile

<https://www.wyofile.com/girls-decoy-grouse-lure-birds-from-drilling-rig-noise/>

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More than 48% of the land in Wyoming is owned by the federal government, placing Wyoming sixth among states in total acres and fifth in percentage of land owned by the federal government.

The First Transcontinental Railroad, completed in 1869, was financed in part by land grants to the railroad. Every other section (one square mile) of land within twenty miles of the railroad was granted to the Union Pacific, which tried to sell the land to raise capital for the venture. The sale of these sections to private land owners resulted in a permanent checkerboard pattern of alternating federal and private land in southwestern Wyoming.



# Wyoming Public Lands

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## Key

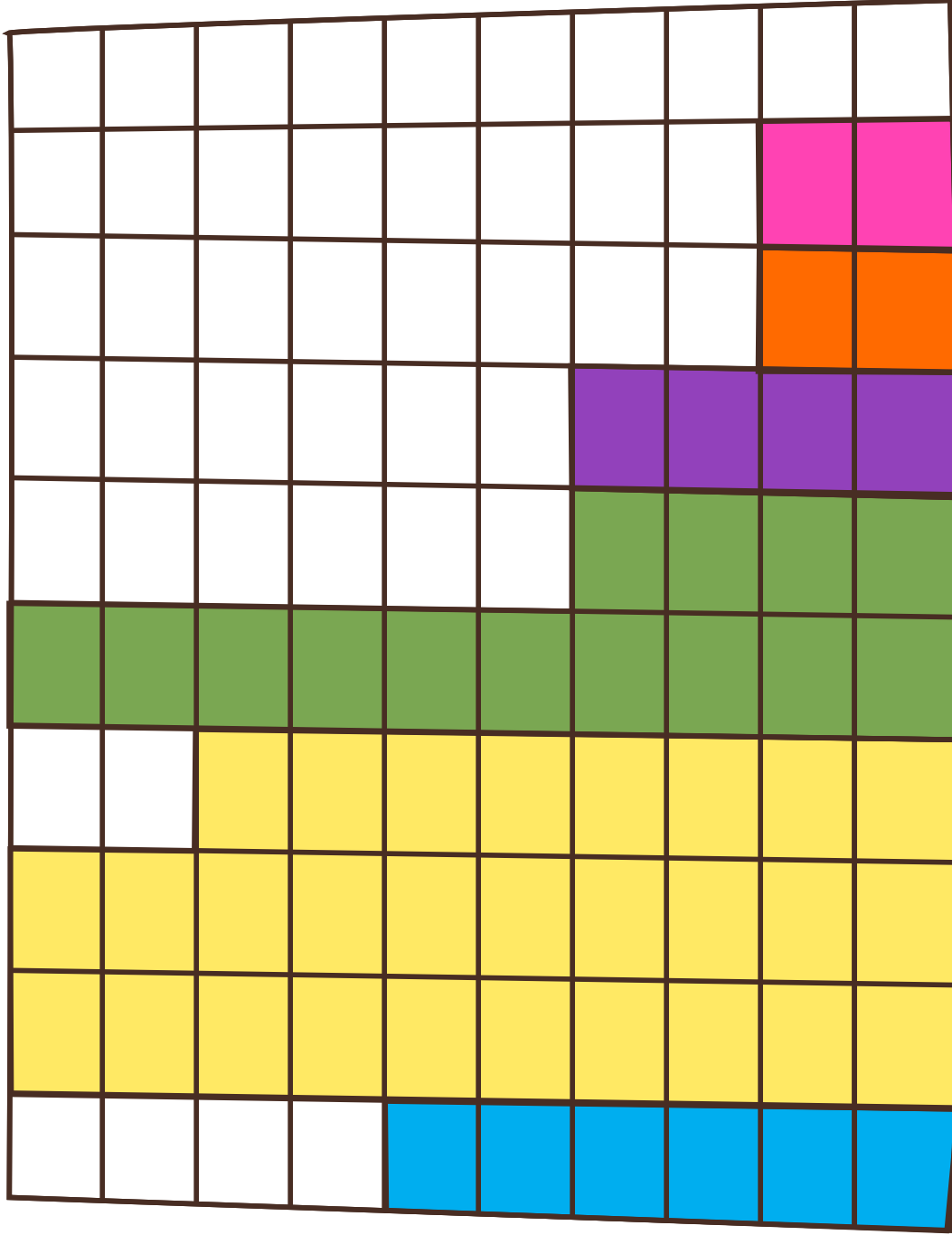
Values as a percentage of Wyoming's total area

- State lands  .06
- BLM lands  .28
- Forest Service  .14
- National Park Service  .04
- Bureau of Indian Affairs  .02
- Other Federal Lands  .02
- Water  0



# Wyoming Public Lands

## Answer Key



### Key

Values as a percentage of Wyoming's total area

- State lands .06
- BLM lands .28
- Forest Service .14
- National Park Service .04
- Bureau of Indian Affairs .02
- Other Federal Lands .02
- Water 0

## Public Land Sort

| What is allowed on public lands:  | What is not allowed on public lands: |
|-----------------------------------|--------------------------------------|
| Hunting                           | Dumping trash                        |
| Fishing                           | Littering                            |
| Camping                           | Taking down fences                   |
| Hiking                            | Abandoning campsites                 |
| Archery and shooting              | Hiking off marked trails             |
| 4-wheeling                        | Hunting illegally                    |
| Snowmobiling, snowshoeing, skiing | Trespassing                          |
| Energy development                | Vandalism and defacing property      |
| Livestock Grazing                 | Starting a fire in an unmarked area  |



# Public Land Sort

What is allowed on public lands:

What is not allowed on public lands:





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## Eaton's Ranch

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# Wyoming State Trust Lands

## Story

### Interview with Jillian Balow, Wyoming State Superintendent of Public Instruction

#### **1-What makes State Trust Lands unique?**

Only 23 states have State Trust Lands. Wyoming was granted 4.2 million acres when we became a state in 1890. The lands are scattered throughout the state in large and small parcels that can be sold, traded, or leased. Wyoming, and all states with State Trust Lands, use the income to help fund education. While the income is not enough to entirely fund our schools, it definitely helps.

#### **2-What are the challenges/issues you feel face our State Trust Lands?**

1. Some state trust land parcels are more valuable than others so trades, purchases, and leases must be considered case by case. This sometimes takes years and many hours of research and negotiating.
2. Some land parcels have been abused by citizens, and the land managers have to make difficult decisions to not let people use the land any longer. This is especially difficult because the land belongs to all of us and we want everyone to be good stewards.
3. Many parcels of State Trust Land can be used for more than one reason. For example, a parcel that is leased by a rancher for grazing may also be used by citizens for hiking or camping. Balancing multiple use of the land takes a lot of work and cooperation.

#### **3-What would you want 5th graders to know about State Trust Lands?**

You own Wyoming's State Trust Lands. When you are 18 years old, you will have a say in who manages the lands by voting in your local and statewide elections. Every four years, Wyoming voters elect five statewide officials: the governor, secretary of state, auditor, treasurer, and state superintendent. We are the managers for our State Trust Lands. When a citizen or company wants to lease, purchase, or trade State Trust Land, they make their case to the managers. The five elected officials love working with Wyoming citizens on land challenges that allow more animals, people, and businesses to enjoy the land.

#### **4-How can our schools be good stewards of the State Trust Lands?**

All public lands, parks, forests, etc., are special, but State Trust Lands are truly ours; we can use them and make extra money to help pay for education. We all must be responsible landowners, and we can do that by understanding more about trust lands, using the lands with friends and family, and taking care of them as we would our own land.



# Wyoming State Trust Lands

## Story

### **5-What is the most challenging decision you have had to make as our current superintendent of schools with our State Trust Lands?**

The land managers have a responsibility to maximize revenue on State Trust Lands. In other words, we must make money for schools. Sometimes, however, we must weigh Wyoming's beauty, our sense of stewardship, and multiple use opportunities with making money. All land sales, trades, and leases are challenging for this reason. In Wyoming though, we work together to reach solutions.

### **6-What does it mean to you to be a good steward of Wyoming's lands?**

Stewardship of Wyoming's State Trust Lands goes beyond using the land. Many of us use the land for hunting, fishing, camping, grazing, drilling for oil, and more. We are good stewards of the land through our responsible use, but you don't have to step foot on State Trust Land to be a good steward. Do you have a better understanding of State Trust Lands now? If yes, you are a good steward. Will you pay your taxes as an adult? If yes, you are a good steward. Will you vote as an adult for the person you think is best for the job they are seeking? If yes, you are a good steward.



# Wyoming State Trust Lands







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**Jillian Balow**

**Wyoming State Superintendent of Public Instruction**



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Darin Westby

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Director of Wyoming Department of State Parks and Cultural Resources



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## State Park Location Clues

|   |  |  |
|---|--|--|
| <p style="text-align: center;"><b>State Park #1</b></p> <p>This state park is home to small herds of bison and elk and offers several miles of paved trails along the beautiful Bear River on the east side of the city of Evanston, Wyoming.</p>     | <p style="text-align: center;"><b>State Park #2</b></p> <p>This state park and its reservoir are named after Asmus Boysen who built the first dam between Riverton &amp; Shoshone in 1908.</p>   | <p style="text-align: center;"><b>State Park #3</b></p> <p>This park found near Cody, Wyoming, is named after the famous showman, Buffalo Bill Cody. It has a 350 ft. dam providing irrigation and recreation water to its citizens.</p>                               |
| <p style="text-align: center;"><b>State Park #4</b></p> <p>This state park is found in both Laramie and Albany Counties. It has three reservoirs that offer excellent fishing and boating and is named after the famous sportscaster, Curt Gowdy.</p> | <p style="text-align: center;"><b>State Park #5</b></p> <p>This state park, located east of Casper on the North Platte River, boasts the perfect picnic place and is designated as a bird watcher's paradise. It is named after Edness Kimball Wilkins, a state legislator for 25 years.</p> | <p style="text-align: center;"><b>State Park #6</b></p> <p>This park is best known for its excellent boat opportunities and camping areas around the Glendo Dam.</p>   |
| <p style="text-align: center;"><b>State Park #7</b></p> <p>Visitors use this state park as a base camp to visit the famous Oregon Trail ruts. This park is near the town of Guernsey with 13 miles of historic trails.</p>                            | <p style="text-align: center;"><b>State Park #8</b></p> <p>Boating, fishing, and swimming opportunities are the primary activities that bring visitors to this state park. Perhaps you can spot a hawk nesting in a the giant cottonwoods near La Grange, WY.</p>                            | <p style="text-align: center;"><b>State Park #9</b></p> <p>This park has a free bath house where the water is maintained at 104 degrees for therapeutic bathing in Thermopolis, WY. More than 8,000 gallons of water flow over the mineral terrace every 24 hours.</p> |
| <p style="text-align: center;"><b>State Park #10</b></p> <p>Some of the largest fish in our state have been caught at this state park. The key to finding this state park is to know where the Black Hills are located.</p>                           | <p style="text-align: center;"><b>State Park #11</b></p> <p>The Seminoe Mountains surrounding this state park were once the site for gold prospecting during the late 1800s.</p>   | <p style="text-align: center;"><b>State Park #12</b></p> <p>This state park is named after a distinct geological phenomena in which the Popo Agie river sinks into a limestone cavern and reappears in a pool filled with 8-12 lb. rainbow trout.</p>                  |



# Glendo State Park

## Story

Until 2005, camping at Glendo State Park was allowed in various campgrounds, however there were not specific campsites.

People were allowed to camp wherever they could find a spot to pitch a tent or park their camping unit, including right on Sandy Beach.

On especially busy weekends or on some of the more popular summer holidays at Glendo, this congested camping plan made things difficult for law enforcement to find problem areas when called especially at night.

Additionally, high congestion in a small areas of land began to adversely affect the park's natural resources, especially on Sandy Beach where parked vehicles sometimes leaked engine oil or got stuck in the sand.

During 2005, the first phase of improvements were completed at Sandy Beach involving designated single and circle campsites and the addition of shade trees and a picnic shelter area located south of the main entrance road. Additionally, a post-and-cable fence restricting vehicle access along the beach was erected on the entire Sandy Beach area.

In 2007, a second phase of improvements began with the addition of designated campgrounds, ADA campgrounds, parking areas, and new restrooms north of the main entrance road. Also, improvements to the south side of the entrance road - the Dunes Campground -- included the addition of a day use only beach area (open only from 6 a.m. to 10 p.m.) and a tent only camping area further to the south. In the shelter area, plans call for additional parking areas, additional trees, a turf area, and new sand volleyball and horseshoe pits.



*Biking at Glendo Lake. Photo credit: Wyoming State Parks*

An entrance station is also scheduled along the main road allowing Division of State Parks and Historic Sites personnel to restrict access to the area when a predetermined visitor capacity has been reached.

Other plans during the 2007 season at Sandy Beach included an increased law enforcement emphasis throughout the summer and increased law enforcement personnel on the Memorial Day, Fourth of July, and Labor Day weekends.



Corner #1

Bureau of  
Land  
Management



# Four Corners

## Bureau of Land Management

The Bureau of Land Management (BLM) is an agency within the United States Department of the Interior that administers more than 247.3 million acres of public lands in the United States which constitutes one-eighth of the landmass of the country. President Harry S. Truman created the BLM in 1946 by combining two existing agencies: the General Land Office and the Grazing Services. The agency manages the federal government's nearly 700 million acres of subsurface mineral estate. Most BLM public lands are located in these 12 western states: Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming

The mission of the BLM is "to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations." Originally BLM holdings were described as "land nobody wanted" because homesteaders had passed them by. All the same, ranchers hold nearly 18,000 permits and leases for livestock grazing on 155 million acres of BLM public lands. The agency manages 221 wilderness areas, 23 national monuments, and some 636 other protected areas as part of the National Landscape Conservation System totaling about 30 million acres. There are more than 63,000 oil and gas wells on BLM public lands. Total energy leases generated approximately \$5.4 billion in 2013, an amount divided among the Treasury, the states, and Native American Groups.



## Corner #2

# U.S. Forest Service



# Four Corners

## U.S. Forest Service

Multi-faceted agency that manages 154 national forests and 20 grasslands in 43 states and Puerto Rico. The agency's mission is to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations.

The U.S. Forest Service (USFS) has an elite wildland firefighting team and the world's largest forestry research organization. Experts provide technical and financial help to state and local government agencies, businesses, private landowners and work government-to-government with tribes to help protect and manage non-federal forest and associated range and watershed lands.

Work through partnerships with public and private agencies help plant trees, improve trails, educate the public, and improve conditions in wildland/urban interfaces and rural areas. USFS also promotes sustainable forest management and biodiversity conservation internationally.

Gifford Pinchot, first Chief of the Forest Service, summed up the mission of the Forest Service: "to provide the greatest amount of good for the greatest amount of people in the long run."





## Corner #3

# U.S. Fish and Wildlife Service



# Four Corners

## U.S. Fish and Wildlife Service

Our Mission is to work with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.

We are a bureau within the Department of the Interior.

### **Our Objectives:**

Assist in the development and application of an environmental stewardship ethic for our society, based on ecological principles, scientific knowledge of fish and wildlife, and a sense of moral responsibility.

Guide the conservation, development, and management of the Nation's fish and wildlife resources.

Administer a national program to provide the public opportunities to understand, appreciate, and wisely use fish and wildlife resources.

**Functions:** Here are a few of the ways we try to meet our mission: Enforce federal wildlife laws, protect endangered species, manage migratory birds, restore nationally significant fisheries, conserve and restore wildlife habitats such as wetlands, help foreign governments with their international conservation efforts, and distribute hundreds of millions of dollars through our Wildlife Sport Fish and Restoration program in excise taxes on fishing and hunting equipment to State fish and wildlife agencies.

**Resources:** We manage the 150 million-acre National Wildlife Refuge System of more than 560 National Wildlife Refuges and thousands of small wetlands and other special management areas. Under the Fisheries program, we also operate 70 National Fish Hatcheries, 65 fishery resource offices, and 86 ecological services field stations.

The vast majority of fish and wildlife habitat is on non-Federal lands. Voluntary habitat protection and restoration programs like the Partners for Fish and Wildlife Program and the Coastal Program and other Partnership programs are the primary ways we deliver habitat conservation on public and private lands.

The Service employs approximately 9,000 people at facilities across the U.S. The Service is a decentralized organization with a headquarters office in Washington, D.C., with regional and field offices across the country.



## Corner #4

# National Park Service



# Four Corners

## National Park Service

Since 1916, the National Park Service has been entrusted with the care of our national parks. With the help of volunteers and partners, we safeguard these special places and share their stories with more than 275 million visitors every year, but our work doesn't stop there.

We are proud that tribes, local governments, nonprofit organizations, businesses, and individual citizens ask for our help in revitalizing their communities, preserving local history, celebrating local heritage, and creating close to home opportunities for kids and families to get outside, be active, and have fun.

Taking care of the national parks and helping Americans take care of their communities is a job we love, and we need—and welcome—your help and support.

### **Our Mission**

The National Park Service preserves the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

### **Our Employees**

More than 20,000 strong, the uncommon men and women of the National Park Service share a common trait: a passion for caring for the nation's special places and sharing their stories.





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## Cloud Peak Energy

### Stewardship Award Recipients

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## Middle School Students

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Maggie and Nora



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# Cloud Peak Energy Story

## Cloud Peak Energy Mine Receives Wildlife Stewardship Award for Eagle Protection from Wyoming Game and Fish Department

GILLETTE, Wyo.--(BUSINESS WIRE)--Cloud Peak Energy Inc. (NYSE:CLD), one of the largest U.S. coal producers and the only pure-play Powder River Basin ("PRB") coal company, today announced its Antelope Mine received the Wyoming Game and Fish Department's Industry Reclamation Wildlife Stewardship Award. The mine, located in Northeastern Wyoming, was recognized for its successful efforts to promote population numbers of Golden Eagles and other raptors through habitat enhancement and use of effective protection measures, including rescuing a young eaglet that was later released at the mine following rehabilitation.

"Environmental safeguards and restoration at Antelope Mine are a key priority for us," said Steve Cowan, General Manager of the Antelope Mine. "The Powder River Basin provides natural habitat for a wide variety of birds and animals. Working with a broad team across the company and outside experts, we've been able to mitigate potential impacts while mining activity proceeds. We are demonstrating the ability to produce coal that provides safe, affordable, and reliable electricity while at the same time being responsible stewards of the environment."

Antelope Mine implemented a unique and intensive monitoring program for the Golden Eagle territories located within the mine permit area. Since 2011, the mine has worked closely with the U.S. Fish and Wildlife Service Ecological Service Office and Migratory Bird Permit Office to ensure that mine operations do not negatively impact local Golden Eagle pairs.

Antelope Mine's intensive monitoring program, coupled with rapid operational adjustments, allows the mine to operate in proximity to eagle pairs and at the same time, fosters successful nesting of the area's Golden Eagle pairs. In the spring of 2015, as a result of Antelope Mine's monitoring program, it was found that a Golden Eagle nest, previously near the top of the highwall, had fallen during an extreme storm. "Tumbler," the young eaglet, had fallen to the bottom of the highwall. With the help of the Antelope Mine personnel and the visiting biologist, Tumbler was rescued and temporarily relocated to the Ironside Bird Rescue facility in Cody, Wyoming. A transitory home was created where he was trained to hunt for himself, provided visual images of other Golden Eagles, and received only limited human contact to help keep him wild.

After a short stay at the bird rescue facility, the Antelope Mine readily agreed to return Tumbler to his original nesting area as this would provide the best habitat for his long-term survival. In August 2015, Tumbler and his companion from the bird rescue facility, Hobbit, were released into their new habitat on land adjacent to the mine.



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# Cloud Peak Energy Story

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Both young eagles have been observed in the vicinity of the mine, providing confidence that they have returned safely to the wild. The Antelope Mine is an ideal home for eagles and other raptors due to its high-quality reclamation, ongoing wildlife studies, protection plans, and a demonstrated commitment to care for wildlife and the land.

In addition to this award, Antelope Mine has been honored with other recognitions including the nation's most prestigious reclamation award, the Office of Surface Mining Reclamation and Enforcement's Excellence in Surface Coal Mining Reclamation Award twice, once in 2010 and again in 2014.

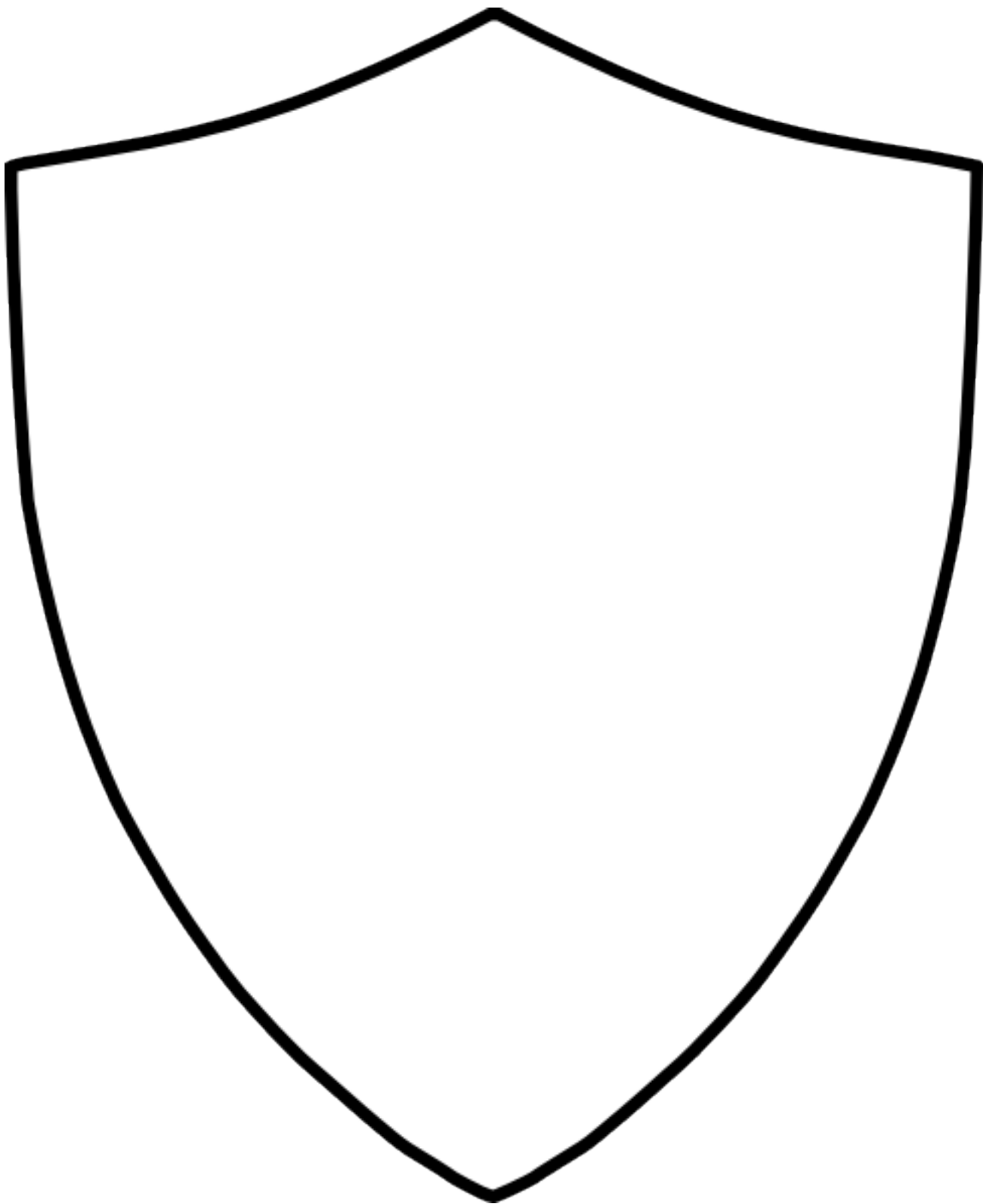
## About Cloud Peak Energy ®

Cloud Peak Energy Inc. (NYSE:CLD) is headquartered in Wyoming and is one of the largest U.S. coal producers and the only pure-play Powder River Basin coal company. As one of the safest coal producers in the nation, Cloud Peak Energy mines low sulfur, subbituminous coal and provides logistics supply services. The Company owns and operates three surface coal mines in the PRB, the lowest cost major coal producing region in the nation. The Antelope and Cordero Rojo mines are located in Wyoming, and the Spring Creek Mine is located in Montana. In 2015, Cloud Peak Energy shipped approximately 75 million tons from its three mines to customers located throughout the U.S. and around the world. Cloud Peak Energy also owns rights to substantial undeveloped coal and complementary surface assets in the Northern PRB, further building the Company's long-term position to serve Asian export and domestic customers. With approximately 1,300 total employees, the Company is widely recognized for its exemplary performance in its safety and environmental programs. Cloud Peak Energy is a sustainable fuel supplier for approximately three percent of the nation's electricity.





Check for Understanding  
Blank Emblem



## Will Boekel, Geyser Gazer Story

It's 12:10 P.M., and the placard next to the reception desk in the Old Faithful Inn says that the next eruption of its namesake geyser will occur in five minutes. The crowd has moved out to the boardwalks behind the inn in front of a steaming, burbling, mostly flat area that looks like the surface of a planet far out in space, except for the grove of lodgepole pine in the background. Visitors have gathered on this spot since at least 1870 when the Washburn expedition noted the size, frequency, and regularity of this spurt of steam and water shooting as high as 184 feet in the air from a cone-shaped mound of earth and decided it was worthy of the name Old Faithful.

Close to 12:15 P.M., the crowd buzzes as the first sign of life from below the earth appears. After five minutes of 10-foot spurts and steam, an onlooker asks with disappointment, "Is that it?" Fortunately Will Boekel, geyser expert, is standing nearby. Just as he says, "Give her another minute." Whoosh! A column of white, frothy, hot water shoots up, climbing first 50 feet and then on up to what Will estimates to be about 150 feet for two and a half minutes. The crowd goes wild. Just as quickly, the geyser retreats back to bubbles on the surface of the earth, and most viewers head back to the gift shop—except for Will. He has work to do. He's entering all that he has observed into his smart phone for transmission to the Geyser Observation and Study Association, a nonprofit organization that serves as a repository for the many avid volunteer observers to record their observations of geysers and other geothermal phenomena.

Will, who also works at the front desk of the inn, comes prepared for long hours of observation with a backpack containing water and food, a jacket in case of rain, watches, a two-way radio to communicate with other "geyser gazers," and a smart phone to post eruptions to the online data base. He discovered geyser gazing and the organization in 2011 and has been hooked ever since.

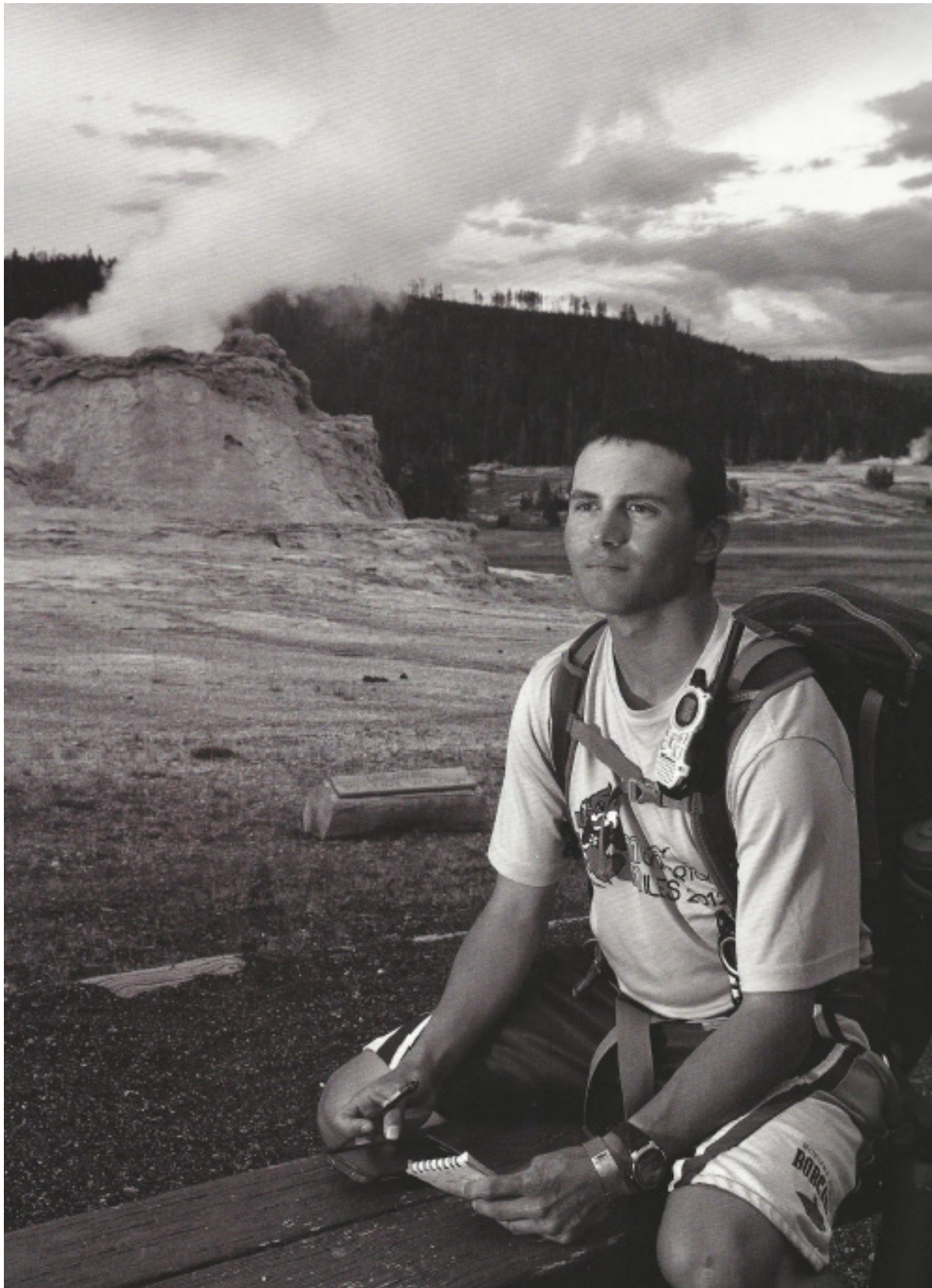
"I've met fascinating people from around the world, and we are like a family."

Originally, gazers wrote their observations in private logs and shared as much as they could. Today, they report over radio networks and write in a public online notebook. Will, a student in mechanical engineering, hopes that someday he will find work related to geysers. For now, he is just happy waiting and watching.



\*reprinted from People of Yellowstone, by Ruth Crocker.

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Will Boekel

Geyser gazer, student



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## Month/Visitors Sort

Draw a line to match the month with the number of visitors to Yellowstone National Park.

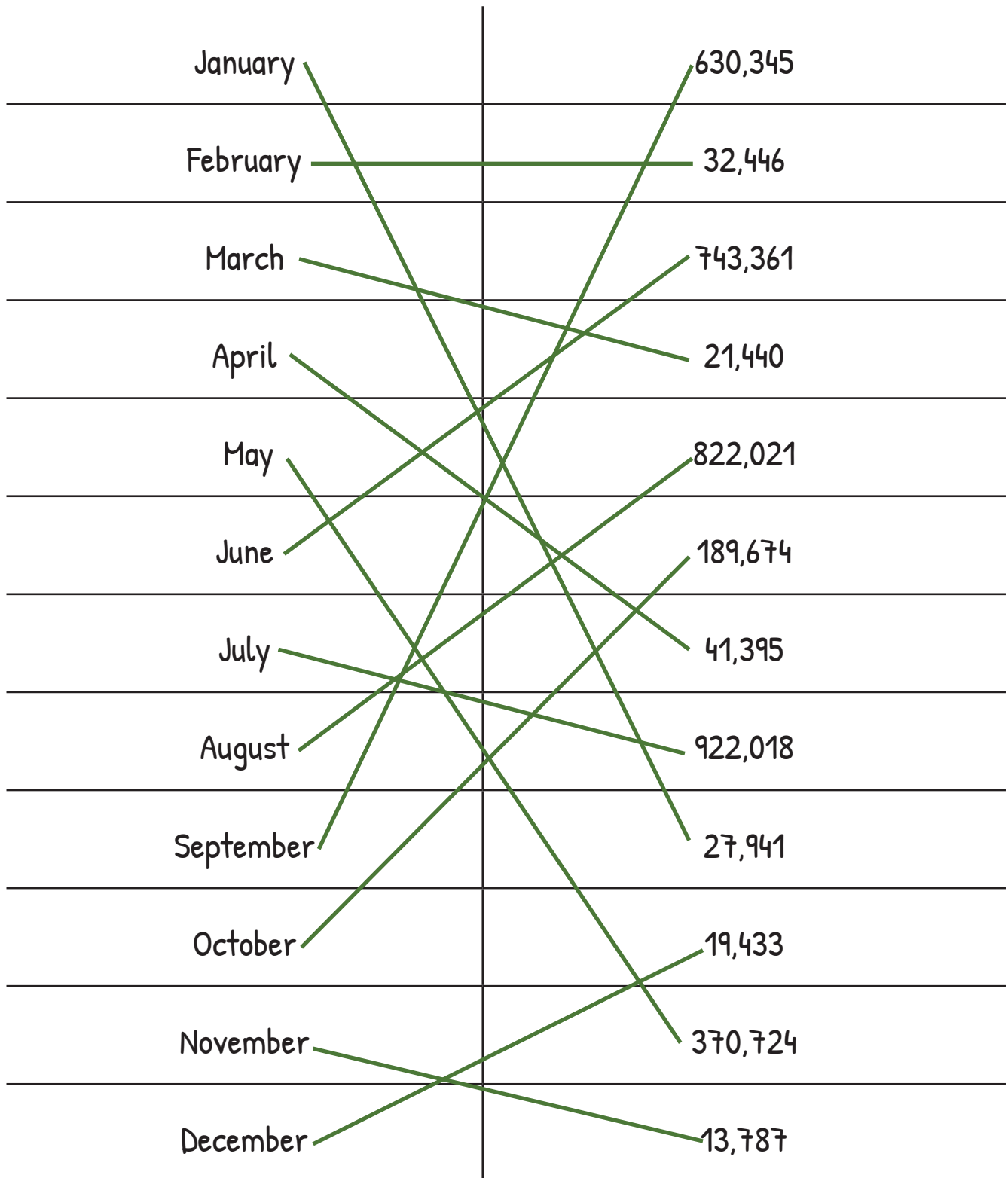
|           |         |
|-----------|---------|
| January   | 630,345 |
| February  | 32,446  |
| March     | 743,361 |
| April     | 21,440  |
| May       | 822,021 |
| June      | 189,674 |
| July      | 41,395  |
| August    | 922,018 |
| September | 27,941  |
| October   | 19,433  |
| November  | 370,724 |
| December  | 13,787  |



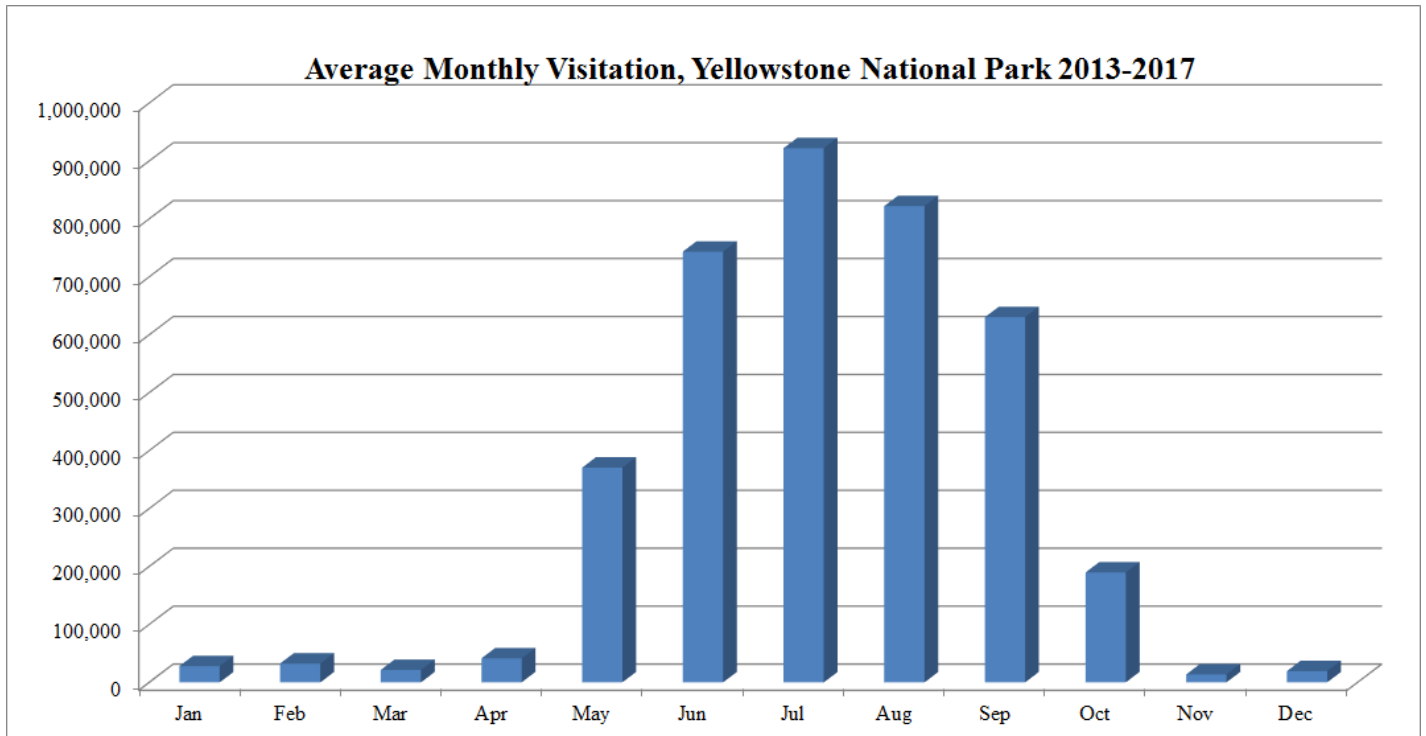
# Month/Visitors Sort

## Key

Draw a line to match the month with the number of visitors to Yellowstone National Park.



# Yellowstone Visitation Statistics



The average visitation to Yellowstone per month from 2012-2017. Raw numbers are included in the table below. NPS / Peggy Olliff

| Month     | Average # of Visits (2012-2017) | % of Average Annual Visits |
|-----------|---------------------------------|----------------------------|
| January   | 27,941                          | 0.73%                      |
| February  | 32,446                          | 0.85%                      |
| March     | 21,440                          | 0.56%                      |
| April     | 41,395                          | 1.08%                      |
| May       | 370,724                         | 9.67%                      |
| June      | 743,361                         | 19.39%                     |
| July      | 922,018                         | 24.04%                     |
| August    | 822,021                         | 21.44%                     |
| September | 630,345                         | 16.44%                     |
| October   | 189,674                         | 4.95%                      |
| November  | 13,787                          | 0.36%                      |
| December  | 19,433                          | 0.51%                      |



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# Stewardship Postcard

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photo by Stephanie Russell



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# Stewardship Postcard

A large rectangular box for drawing a scene. Inside the box, there is a horizontal line near the top, a small square in the top-left corner, and three vertical lines on the right side.





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# Margie Fey Story

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## National park ranger, aquatic invasive species inspector

During her early days as a health and physical education teacher looking for a summer adventure in 1975 with her husband, Rick Fey, Margie never imagined that she would work from turf to surf at Yellowstone National Park, at first perched high in a fire tower on Mount Washburn watching for forest fires, followed by twenty-five years in law enforcement, and moving eventually to resource management inspecting boats that might carry invasive aquatic species. Preventing the introduction of nonnative (from another continent or outside their normal range) aquatic species has become a passion for Margie. “People don’t realize how easy it is to bring a tiny hitchhiker along in the crevice of a boat when they’ve been boating in other waterways outside the park.”

Aquatic invasive species pose significant dangers to Yellowstone’s ecological processes. If a nonnative species has no natural predators in its adopted environment, its population may increase rapidly and threaten the native species, causing a native species to become extinct, with the highest extinction rates occurring in freshwater environments. In addition to nonnative fish in Yellowstone, three more aquatic invasive species are having a significant detrimental effect in the park: *Myxobolus cerebralis* is a parasite that causes whirling disease in cutthroat trout and other species; New Zealand mud snails, which form dense colonies and compete with native species; and red-rimmed melania, a small snail that was first imported by the aquarium trade in the 1930s and was discovered in the warm swimming area at the confluence of the Boiling and Gardner Rivers in 2009.

Eliminating aquatic invasive species after they become established in a watershed is usually impossible and extremely expensive. Each summer Margie is part of a small team of park technicians who inspect, decontaminate, and air-dry visitors’ boats and angling gear before they can be placed in the water. Such decontamination is usually adequate to prevent the entry of most aquatic invasive species. She reminds people that it is illegal to use any fish as bait in Yellowstone National Park, and it’s also illegal to transport fish from one river or lake to another in the Yellowstone region.

During the years in which Margie returned to the classroom each fall, she says the Yellowstone experience created a remarkable increase in her skills as a teacher.

“It’s been a marvelous journey of learning and satisfaction that I’m contributing to the future of this wonderful place.”

\*reprinted from People of Yellowstone, by Ruth Crocker.

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# Cheatgrass

## Proposed Solutions

### SOLUTION 1: Cattle (source 3)

Using cattle for early-season grazing doesn't hurt the land or natural grass. To reduce cheatgrass density and size, have cattle graze while the cheatgrass is green during the spring and again in the fall by using a high intensity (many cows), short grazing time approach. Plants at this time of year are young and green which is more palatable (tasty) for cows. Proper timing and close management of livestock is required to minimize impact to desirable plant species.

Cheatgrass will not be eliminated by grazing. Cheatgrass will remain in the soil for several years because it has lots of seeds. However, when the next crop grows up in the spring without that cover from the former years' thatch (dried grasses) to protect it from full sunlight, it doesn't grow as vigorously.

**Cost:** It costs approximately \$0 per acre. Depending on the timing, this solution can actually save a ranch money that may have been spent on hay or other livestock feed.

### SOLUTION 2: Apply Herbicides (sources 4 & 5)

Herbicides approved for use on cheatgrass are usually best applied in fall or early winter before soils are frozen. Spray can be used in the spring on plants that are 2 to 3 inches tall. Once cheatgrass is removed, native plants will grow, thereby allowing natural restoration. You may need to also reseed with native seeds to help promote growth of native plants. Sprayed areas should be re-treated as necessary with spot spraying. This multi-year program for cheatgrass control has been demonstrated to provide one of the best outcomes over the long term. Herbicides can not be used among crops, but they are useful on rangelands. It is important to gain information about the herbicide because some may not allow for grazing for up to a full year after use. Caution also has to be used due to the possibility of herbicides contaminating groundwater.

**Cost:**

It costs approximately \$15 per acre. It usually requires additional applications in future years to maximize effectiveness.



# Cheatgrass

## Proposed Solutions

### **SOLUTION 3: Fire** (sources 6 & 7)

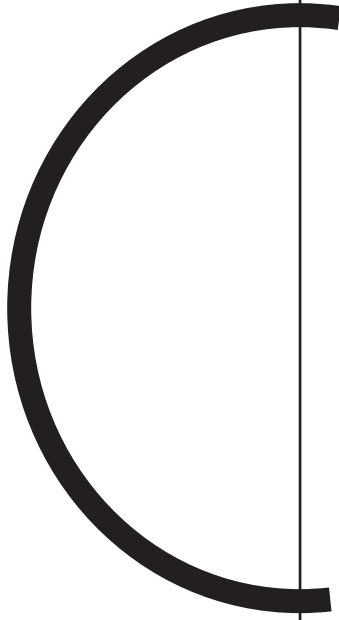
Controlled Burning Treatment should take place in late spring and summer; controlled burning has associated risks which should be addressed in a prescribed (planned) burn plan. Cheatgrass is highly flammable, with densely growing populations which provide lots of fuel that increase fire intensity. If not done correctly, prescribed burns may escape control and become wildfires, produce smoke that impairs visibility on highways or impacts individuals with respiratory problems, and may cause damage to desirable vegetation. For cheatgrass growing in a sagebrush habitat, burning will destroy the sagebrush leaving ground that cheatgrass can invade even quicker. If the native plant community is changed, erosion and damage to water resources can occur. To be most effective, the fire solution for cheatgrass should be used along with a plan for spraying herbicides and replanting.

#### **Cost:**

It costs between \$10 and \$435 per acre depending on the area to be burned, the number of firefighters, and the equipment required. A prescribed burn plan and cooperation with local fire districts and local controlled burn specialists is required.



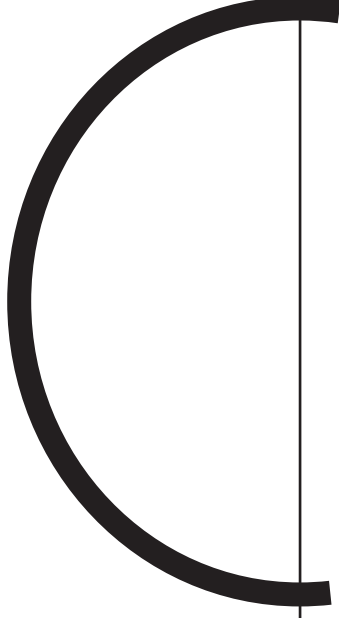
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Important Ideas:

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
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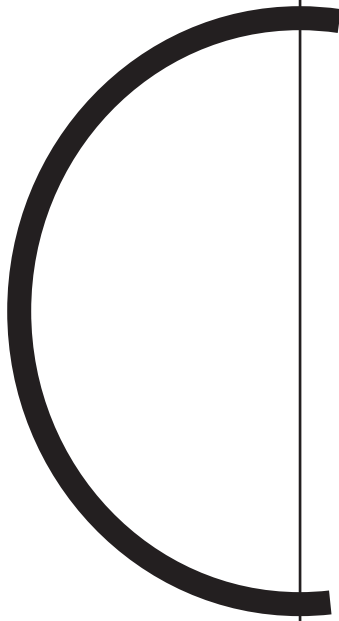
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Important Ideas:

1. \_\_\_\_\_  
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Evidence:

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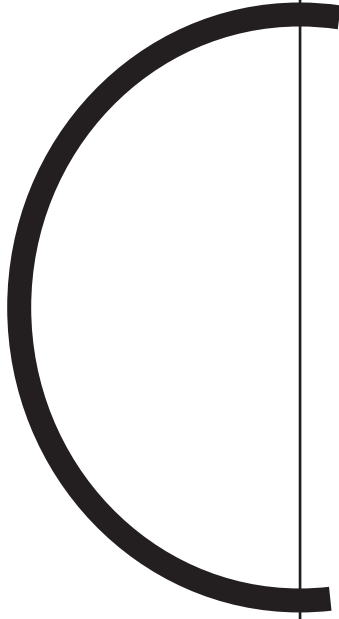
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Evidence:

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Margie Fey  
National Park Ranger



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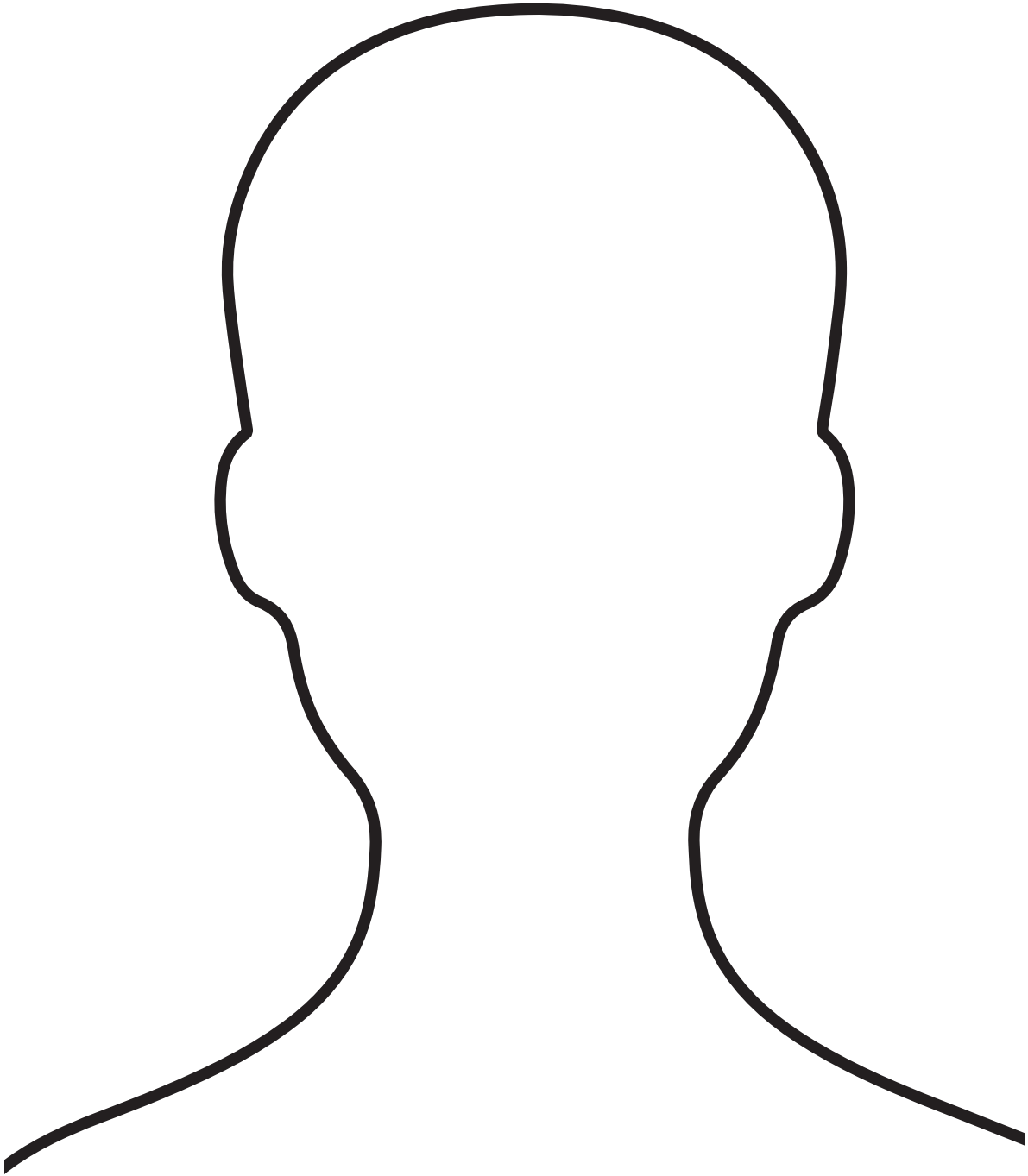
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**DeWitt Morris**  
Owner of Mountain Springs Ranch

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\_\_\_\_\_

Your Name





# Scenario Cards

## Scenario 1:

You and your family are going hunting this weekend. Your dad says this is a new place he hasn't tried before. You are all very excited to get there. When you arrive, it is later in the evening and starting to get dark. Your dad pulls up to the property to find a sign that says, "No Trespassing, Private Property". No one is around, and it is late at night. As good stewards, what should you and your family do at this point? Make sure to explain why you make the decision you do.

## Scenario 2:

You and your grandparents are going camping for the weekend. When you arrive at the campground, all of the campsites are taken. Your grandfather drives around the campground several times looking for an open spot. He notices a small meadow off the side of the road where he thinks he could set up tents and make a camp. There is no fire pit in this area, and the grasses are pretty dry. Your family really wants to camp and have a fire for roasting marshmallows. What should you do? Make sure to explain why you make the decision you do.

## Scenario 3:

There is a creek running through some public land not far from your house. Near the creek bank are some large rocks. You and your friends often go to the place to play soccer, go fishing, or ride bikes. Today, when you go to the creek to go fishing, you notice that someone has spray painted names and pictures on the rocks. What should you do? Make sure to explain why you make the decision you do.

## Scenario 4:

The city park in your town is a busy place. Many families love to go there to play on the equipment and have picnics. A lot of people take their dogs to the park to play frisbee. One sunny afternoon while you are at the park, you see a large group of children playing and eating at the park. The adult with the children tells them it is time to get ready to go. As the children start leaving, you notice that they are leaving their lunch trash all over the place. What would you do in this situation? Make sure to explain why you make the decision you do.

## Scenario 5:

You and your brother want to go hiking on the public land that is on the other side of a local ranch. The only entrance to the hiking area is a marked trail through the private property of the rancher. The rancher has given you permission to pass through his property to get to the hiking trail but wants you to only go on the marked trail and to not bother/endanger his cattle. The rancher isn't around right now, and he has cattle grazing near the gate. What should you do? Make sure to explain why you make the decision you do.

