

# Walk on the Wild Side: Explore Your Public Lands



Activity Book



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U.S. Department of the Interior

Bureau of Land Management

First printing 2000

Second printing 2001

Third printing 2004

Fourth printing 2014

BLM/VO/GI-00/04+1115+REV15



*printed on recycled paper*

# To Teachers and Parents

This booklet is designed to introduce you and your children to America's public lands. These lands belong to the American people, but they are also home to over 3,000 species of fish and wildlife, as well as a diversity of plant species. Historic and archaeological sites, as well as scenic wonders, abound. In this activity book, you and the children in your life will learn about some of the many natural and cultural resources that can be found on public lands and how you can enjoy them. You'll also learn about the importance of protecting these special places.

Several departments of the United States government manage public lands for us. So do state and local governments. This booklet focuses on lands under the jurisdiction of the Bureau of Land Management (BLM), an agency within the U.S. Department of the Interior. Created more than 50 years ago, the BLM is a little agency with a big job. It has about 10,000 permanent employees—that's fewer employees than in the public schools of Albuquerque, New Mexico. In spite of this, the BLM is responsible for nearly one-eighth of the land in the entire United States—more than 200 million acres located mainly in the western states and Alaska.

The BLM's mission is "to sustain the health, diversity, and productivity of America's public lands for the use and enjoyment of present and future generations." This mission involves managing lands for multiple uses, including a wide range of recreational opportunities. It also involves managing for the sustained yield of resources used for such activities as energy development, livestock grazing, and timber harvesting. At the same time, it requires the BLM to protect natural, cultural, and historical resources on those lands.

The BLM manages many of these resources within its National Landscape Conservation System. The system includes approximately 27 million acres of national monuments, national conservation areas, wild and scenic rivers, national scenic and historic trails, and wilderness—some of the West's most spectacular landscapes. By conserving, protecting, and restoring these National Conservation Lands, the BLM ensures that their outstanding cultural, ecological, and scientific values are preserved—an especially important task as the population of the West continues to grow.

## —BLM on the Web—

National Website: [www.blm.gov](http://www.blm.gov)

Environmental Education Resources:

[www.blm.gov/education](http://www.blm.gov/education)

Volunteer Program:

[www.blm.gov/volunteer](http://www.blm.gov/volunteer)

Recreational Opportunities on Public Lands:

[www.recreation.gov](http://www.recreation.gov)

National Landscape Conservation System:

[www.blm.gov/NLCS](http://www.blm.gov/NLCS)

All public lands—whether they're managed by the BLM, another Federal agency, your state government, or your local community—really do belong to you and to all Americans. Visit your public lands and get to know them—their sights, their sounds, their smells. By doing so, you will develop a personal connection and a commitment to preserving America's big backyard.

# Play, Learn, and Serve on America's Public Lands

You can learn a lot about public lands from the articles and activities in this booklet. But the best way to learn about them is to visit them and take part in some of the Bureau of Land Management's (BLM's) special programs for kids:

## For You and Your Family

**BLM Junior Explorers:** Visiting public lands can be even more of an adventure when you become a Junior Explorer. Some BLM sites have Junior Explorer activity booklets that help you learn more about that site. Other Junior Explorer booklets help you learn more about a particular topic, such as wild horses and burros, fossils, and volcanoes. Each booklet contains activities that you can work through on your own or with others. The booklets include a Junior Explorer pledge, a certificate, and additional information about the BLM. Most BLM Junior Explorer booklets are available online. Many of these booklets are also available at local BLM offices and sites.

**Take It Outside!** Spending time in recreational activities on public lands is a great way to stay healthy and have fun while learning about America's great outdoors. Different BLM offices host a variety of Take It Outside! activities and programs ranging from archaeology field tours and hikes to whitewater rafting and camping.

## For You and Your School

**Hands on the Land:** Many BLM locations are part of the Hands on the Land (HOL) network of outdoor classrooms where students like you can learn about nature, science, history, and much more. The BLM works closely with teachers to develop field trips and programs so you can learn firsthand about subjects you are studying in the classroom. For more information, see [www.handsontheland.org](http://www.handsontheland.org).

## Other Ways to Get Involved

**Volunteer:** People of all ages can volunteer for the BLM. Scout troops, 4-H groups, other youth service organizations, and families can participate in volunteer events or long-term service projects. If you want to join thousands of others in volunteering, consider taking part in National Public Lands Day, the country's largest single-day volunteer event for public lands. See [www.publiclandsday.org](http://www.publiclandsday.org).

### —Learn More—

You can find out more about these and other programs at [www.blm.gov/education](http://www.blm.gov/education).

To find out more about how you can play, learn, or serve on public lands near you, go to [www.blm.gov](http://www.blm.gov) to locate the BLM office nearest you.

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# America's Public Lands

Did you know that there are more than 600 million acres of land in this country that belong to you? This land is not owned by any individual or company. Instead, it's Federal land and it's owned by the American people . . . and that means you!

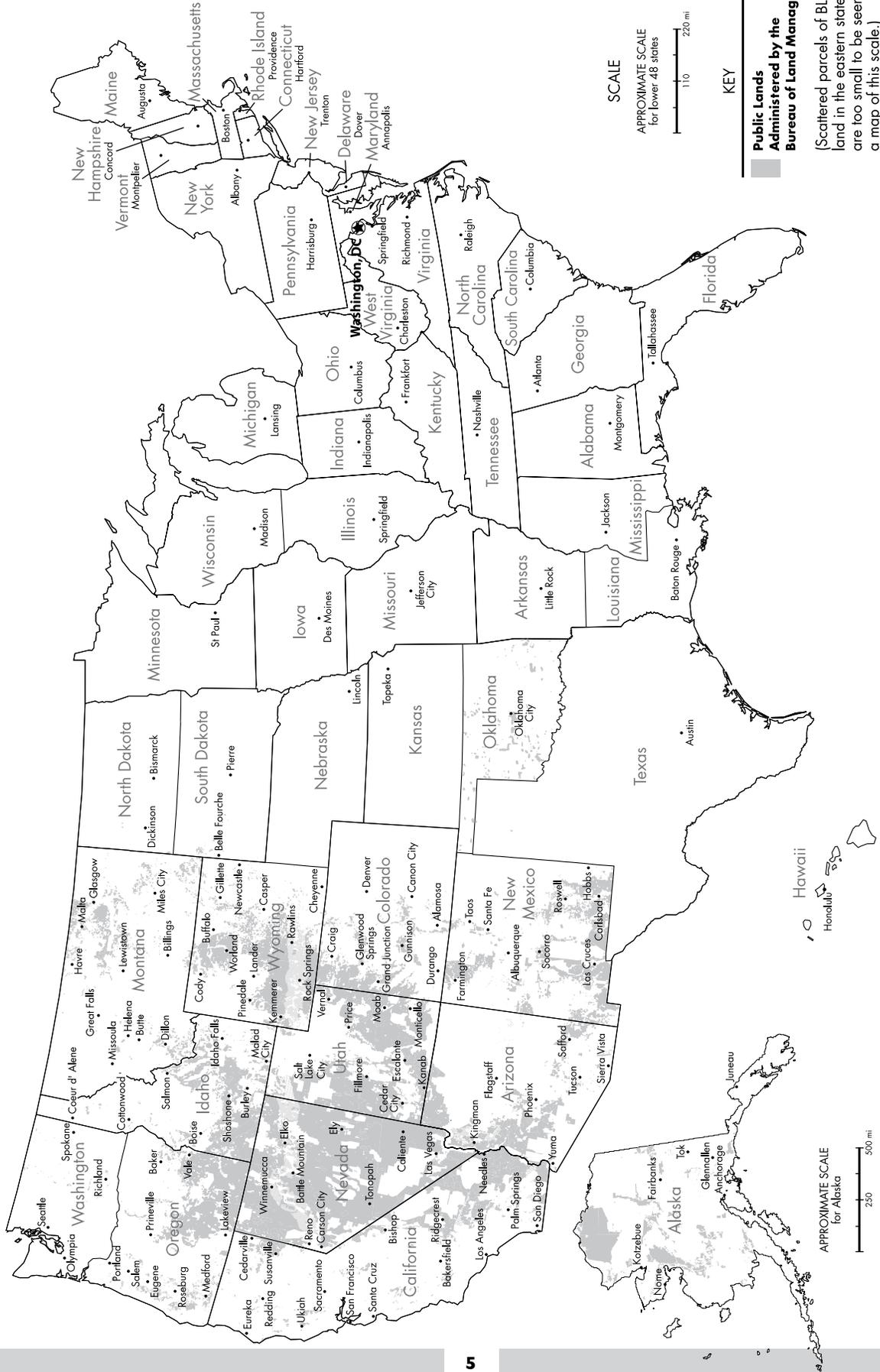
The U.S. government takes care of Federal lands. The U.S. Forest Service, the National Park Service, the U.S. Fish and Wildlife Service, and other agencies are responsible for some of these Federal public lands. And so are other Federal agencies. But the Bureau of Land Management (BLM) takes care of the most land—more than 200 million acres. That's almost equal to all the land in the states of Texas and California put together! BLM's main job is to keep public lands healthy so that you can enjoy them now and so that young people like you can enjoy them for many years to come.

Most BLM lands are found in the western states and Alaska. In the eastern United States, the BLM manages mostly small, isolated areas scattered throughout 31 states. (These areas are too small to be seen on the map on page 5.) The agency also manages 700 million acres of underground mineral rights located throughout the country.

## ACTIVITY Map Talk

- Look at the map on the next page. Can you find your state?
- Where in your state do you live? Put a mark there.
- Use the map key to find the BLM land. Which BLM land is closest to you?
- Draw a line from the mark where your home is to the nearest BLM land. About how many miles away is it? Ask a grown-up if you need help reading the scales at the bottom of the map.
- Does your state have a lot of BLM land or a little? Estimate how much of your state is BLM land. Is it one-fourth or less? Less than one-half? More?
- Find two states that have a lot of BLM land.

# Map Talk



# Pack Your Bags for a BLM Road Trip!

## What Can You See?

If you visit BLM lands, you might find yourself in a desert or a forest, on a glacier or a mountain trail, on open rangeland, along a scenic river, or deep inside a cave. With such a great variety of landscapes, it's not surprising that you can find many types of plants on BLM lands. The soil, water, and plants provide a good home for wildlife, too—from bats and beetles to bighorn sheep and elk. Sheep and cattle graze on rangelands, and wild horses and burros can also be found in many areas.

There's plenty of action on BLM lands . . . and there has been for a long time. In fact, dinosaurs once roamed through the wide open spaces of the West.

Scientists have found fossils of all sorts of dinosaurs on public lands, and signs of many other ancient creatures as well.

People have lived in America's western lands for a long time, too. Prehistoric rock paintings and artifacts help scientists learn about the history of Native Americans.

On public lands, you'll also find natural resources that we depend on: trees for lumber and paper products; energy resources such as coal, oil, and gas; and other minerals we use every day.



# I Spy Scramble

You can see many things on a tour of BLM lands. Depending on where you travel, you might see: mountains, rivers, deserts, glaciers, caves, insects, birds, reptiles, fish, mammals, flowers, and trees, as well as fossils, arrowheads, oil wells, and wind turbines. Below is a list of these things, but the words are all scrambled. First unscramble the words. Then answer the question at the bottom of the page by copying the letters from the numbered boxes into the numbered spaces.

HISF

SERDEST

RISDB

GRSAILCE

SMMAALM

8

VISRER

1

SLIPETER

4

SEAVC

9

SESTICN

12

LOI WSLEL

3

LORSFEW

10

SLOFSIS

5

STERE

HEDOSWARRA

2

NIATUMSON

6

DWNI ENBRISTU

What is something you won't see on BLM lands?

1 2 3 4 4 5 6 7

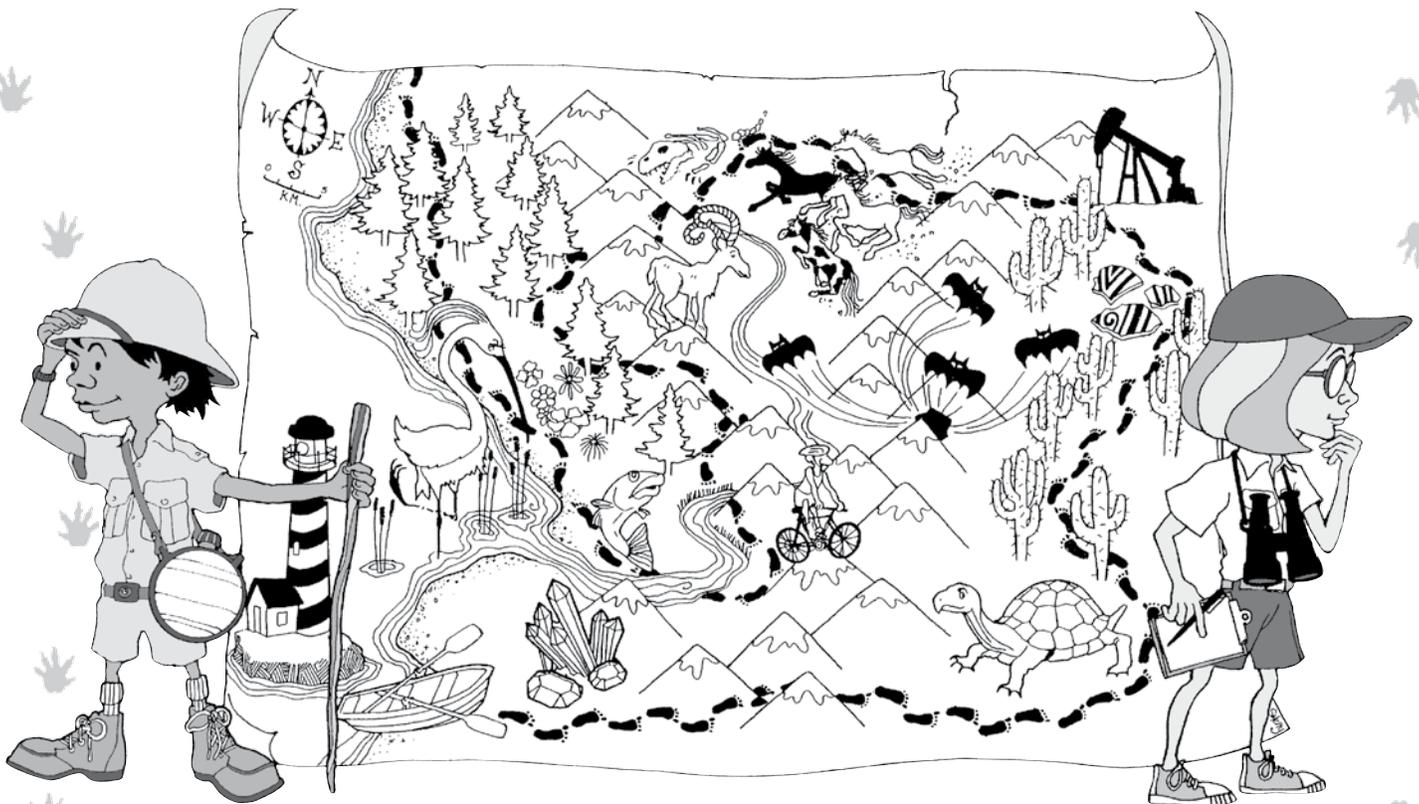
8 9 10 11 12

# What Can You Do?

Many people like to have fun on BLM lands. People can visit BLM lands to get close to nature, to see wildlife and native plants. Some people like to go rafting on the rivers, while others like to visit ghost towns, prehistoric sites, or dinosaur tracks. Still others like to ride their mountain bikes on trails through the forest or the desert. Campers, hunters, hikers, rock climbers, cross-country skiers, trail vehicle fans, and snowmobilers all come to enjoy BLM lands.

People use BLM lands in other ways too. Companies mine coal, gold, and other minerals, as well as sand and gravel. Some build wind turbines and solar energy facilities on the lands. Ranchers use the grasses and shrubs to feed their cows and sheep. Timber companies harvest trees. Towns can obtain land from the BLM for parks and schools.

Indian tribes carry out their traditions on BLM lands, too. They use plants that provide special foods, such as pine nuts. They also gather natural materials to make pottery, blankets, clothing, and other items.



# Just Imagine

What would you most enjoy doing on BLM land with your best friend? With your family?  
Draw a picture of yourself and your companions enjoying an outing on BLM land.

# Silent Invaders

The BLM works to keep our public lands healthy and productive. Sometimes that's not an easy job.

One challenge the BLM faces is invasive plants. These plants are not native to North America. Nonnative plants are plants from other areas that have been introduced into different ecosystems.

Invasive plants can spread rapidly because no insects, diseases, or other predators evolved alongside them to control their growth. As they spread, the native plants that grow naturally in an area—and the wildlife that depends on them—are pushed out. When they grow in or near water, invasive plants can turn lakes and rivers into marshy areas where fish can't live.

Scientists estimate that invasive plants are spreading on our public lands in the West at a rate of almost 4,600 acres per day. That's about 3,500 football fields! Spreading at that rate, invasive plants could cover an area about the size of Delaware in just 1 year.

## —You Can Help!—



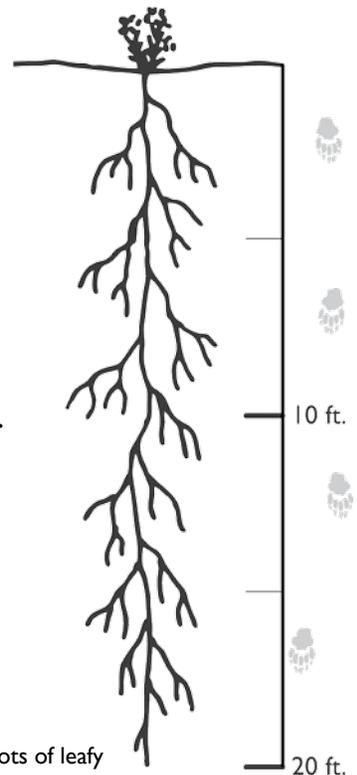
### Stop Invasive Plants!

Invasive plants are costly to remove or control. That's why the BLM needs your help to prevent them from becoming a problem in the first place. Here are a few things you can do to help:

- Learn which invasive plants are present in your area and how to identify and report them.
- Check your clothes, shoes, and backpack for seeds before heading home after hiking or playing outside. Don't forget to check your dog! Carefully place any seeds in a trash bin.
- Find out if your favorite outdoor area has a volunteer cleanup day. Pulling invasive plants can be fun!
- Don't pick unknown flowers—they might be invasive plants and picking them might spread the seeds.

How do invasive plants spread rapidly?

- Some have very long root systems, which makes it easier for the plants to get water. (See illustration at right.)
- Other invasive plants are tall and bushy and produce thousands of seeds. Those seeds can travel great distances by wind or water or hitchhike on animals, vehicles, and people.
- Some invasive plants grow tall very quickly, which keeps the sun from reaching smaller, slower-growing native plants.

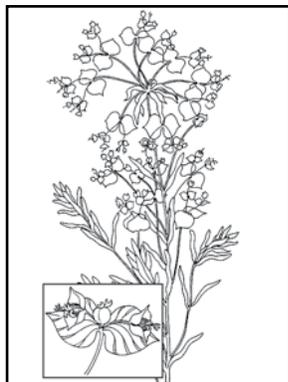


The roots of leafy spurge, an invasive plant, can reach depths of more than 20 feet!

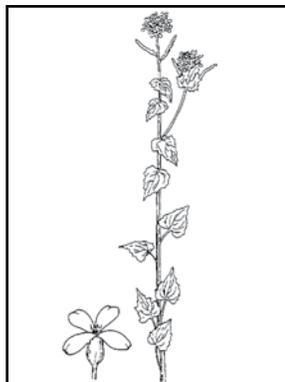
# Where's Weeds?

Scientists who study plants are *botanists*. Botanists identify plants by studying their flowers, leaves, stems, and roots. They alert the BLM, ranchers, foresters, and others when they find an invasive plant in a new area.

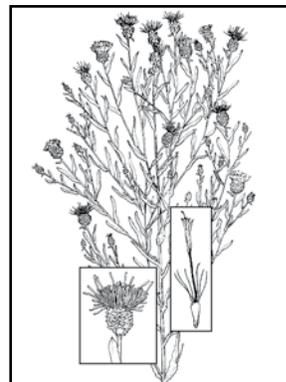
You can become a beginner botanist by learning to identify invasive plants. Study the four invasive plants pictured at the bottom of the page and then circle them in the big picture. Both the common names and the scientific names are given for each invasive plant.



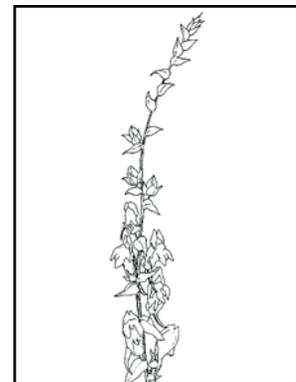
Leafy Spurge  
(*Euphorbia esula*)



Garlic Mustard  
(*Alliaria petiolata*)



Russian Knapweed  
(*Acroptilon repens*)



Dalmatian Toadflax  
(*Linaria dalmatica*)

# Burning Point

There's no doubt about it. Fire is dangerous! That's why you learn about fire safety when you're very young. You know, for example, that you should always give matches to an adult. But if you think about it, fire can also be useful. At home, your parents may barbecue delicious meals on the grill. A fire in the fireplace can keep you warm and cozy on wintry days.

In nature, fires in forests and grasslands can be useful, too. In fact, some fires are actually needed to keep the land healthy. Fires in nature don't always burn with huge flames and great heat. Such smaller fires clean out leaves and dried grass that have built up over a few years. They help recycle dead plants, releasing nutrients into the soil. The nutrients help new grass and other plants to grow. Many animals like to eat the tender, nutritious plants that return after a fire.

In addition, some plants actually need fire. Certain pine cones won't open and drop their seeds without the heat of a fire. Fires can kill insects that harm trees. Even burned, dead trees are

places where birds can nest or sit and watch for prey.

## How to put out a campfire:

1. Drown the fire with water.
2. Use a stick to mix the ashes with the soil.
3. Scrape and chop partially burned sticks.
4. Add more water.
5. Stir with soil again.

To help keep the land healthy, trained fire specialists sometimes set fires. Conditions need to be just right, so that the fires do not get out of control. Fires started in the wrong conditions, without planning, or through carelessness can spread quickly and do a lot of damage. That's why if you live near wildlands or visit them, it's important to be very careful with fire and to follow fire safety rules.

## —Did You Know...?—

... that most wild animals know how to live around fire? They can run or fly faster than most fires can move.



# On the Edge

Riparian areas are the green, moist areas next to a lake, stream, or river where plants grow vigorously. In dry climates, where much BLM land is found, riparian areas are very important. The water itself and the plants alongside attract many different kinds of animals. The plants also help to prevent erosion, which occurs when soil washes into the water. A healthy riparian area helps keep the water clear and cool for fish and other aquatic animals.

In many places in the West, riparian areas have been damaged. Trucks have been driven through streams, or roads have been built too close to the water. Logging and mining operations and other industrial activities have also been harmful to large areas surrounding streams.

So have poor farming practices. In some places, too many cows or sheep grazed nearby. Other popular activities such as hiking, camping, boating, and biking have also weakened stream banks.



**A healthy riparian area**



**An unhealthy riparian area**

All of these actions can destroy plants along the stream and cause stream banks to cave in. Erosion gets worse because there are fewer plants to hold the soil when it rains. The water becomes muddy. And it can get warmer, too, because there are no trees to shade the water. Warm, dirty water means trouble for native fish.

In many places, people are working to repair damaged riparian areas. They are planting trees along stream banks and moving roads away from the water's edge. They are building fences to control livestock grazing near streams. There's still plenty of work to do, but the water in many places is getting cleaner. And fish and wildlife are moving back into these riparian "ribbons of life."

# Down by the Riverside

In each pair of pictures below, circle the activity that will allow the riparian area to stay healthy.



# Forest Keepers

Trees are a natural resource people have been using for a very long time. Many people rely on wood, or timber, from trees that grow in BLM forests. They use wood to build homes and make paper. They also burn wood from our forests for fuel.

Forests do much more than provide trees and wood for people. Forests provide habitat for wildlife, plants, and fungi. Healthy forests have healthy streams that are home to fish and other aquatic life. They also provide people with the chance to enjoy nature.

A healthy forest has a variety of trees growing in it—young and old trees and different species as well. A healthy forest has logs on the ground and standing dead trees, called snags. Fungi and mosses live on these dead trees. A variety of trees and other plants means a variety of animals will be able to live in the forest.

Keeping forests healthy isn't an easy job, but it is an important one! After all, people and wildlife need forests, and so do many other living things.



# Finding Forest Friends

This forest does more than just grow trees for people. It also makes a good home for animals, including an owl, a deer, a frog, a slug, a salamander, a beetle, a vole, a snake, a marten, and a bobcat. See how many you can find. Color each animal when you find it.



# Creature Feature

Forests, rivers, canyons, deserts, tundra, rangelands: With so many wildlife habitats on BLM lands, you can be sure that all sorts of wildlife can be found there. BLM needs to protect animal habitats on the land it manages and still allow for other uses.

Loss of habitat is the reason most animals become endangered. And many things people do can cause loss of habitat. New homes, roads, and shopping malls often force animals from their homes. Damming a river to provide power or water for farms and cities threatens habitat for fish and all wildlife dependent on that river. Logging and mining operations can destroy wildlife habitats as well. And the spread of invasive weeds can threaten the food supply and shelter for native animals.

Tourists can also pose a threat to wildlife. As more people visit public lands, there's a greater chance that wildlife will be disturbed and their habitat damaged. People who use off-highway vehicles (OHVs) have to be particularly careful. OHVs include motorcycles, trail bikes, snowmobiles, four-wheel drive vehicles, and other vehicles that can be driven off paved roads. People on OHVs can travel farther into remote areas, where there's a better chance to see wildlife . . . and a better chance to disturb animals. That's why BLM has set aside trails on some of its lands for OHV use. By staying on the trails, OHV riders are less likely to disturb animals and their habitats.

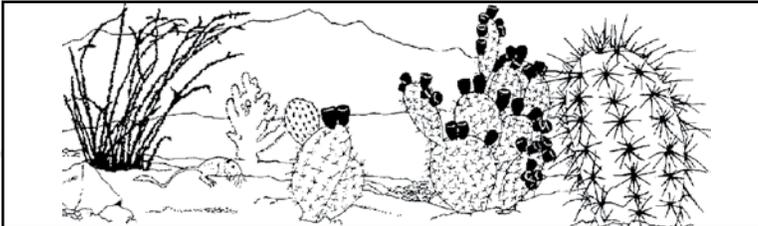
## —Endangered Species—

To find out more about endangered species in your state, check out the website of the U.S. Fish and Wildlife Service: [www.fws.gov](http://www.fws.gov). Next, click on "Endangered Species." You'll be able to find the latest information on endangered plants and animals as well as lists of species that are threatened and endangered in your state. Then check with your local BLM office to find out what you can do to help.

All visitors can help protect wildlife. If you've visited BLM lands by car, by bike, or on foot, you've probably noticed that there are trails and designated parking areas in many places as well. These are designed to keep people from spreading out all over wildlife habitat. You wouldn't want all sorts of people walking through your home, would you? When you think about it, public lands do belong to people, but they also belong to the plants and animals that live there.

# Habitat Match-up

Animals are adapted to the habitats in which they live. This means they have characteristics that help them get what they need to survive there. Below, in the left column, are drawings of some of the habitats you'll find on BLM lands. On the right are some animals looking for a home. Draw a line from each animal to its habitat.



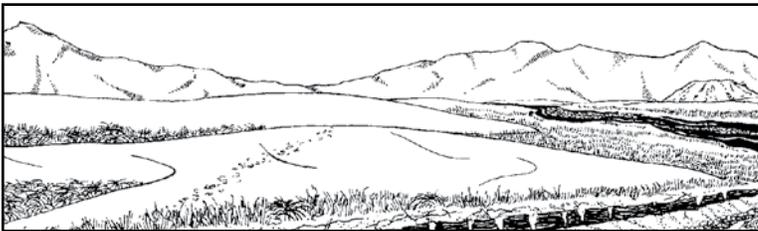
Desert



Grassland



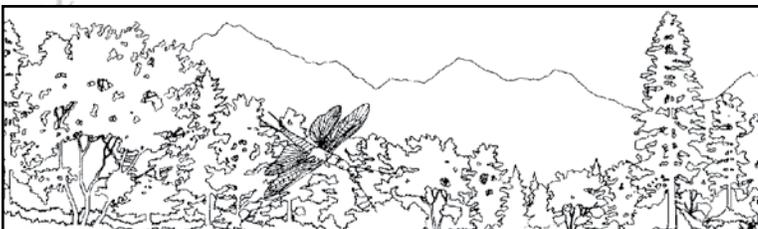
Wetland



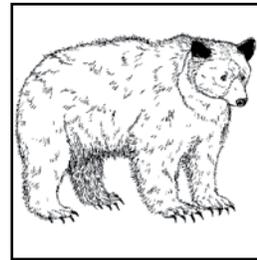
Tundra



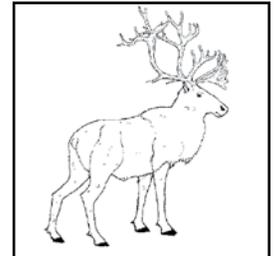
Stream



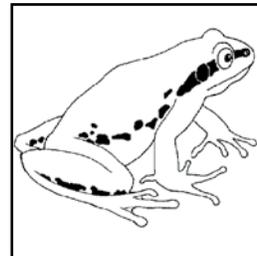
Forest



Bear



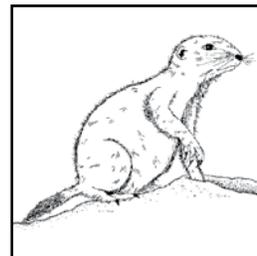
Caribou



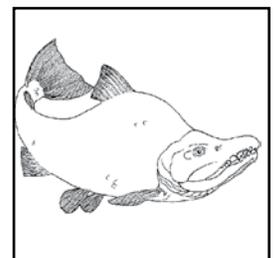
Frog



Short-horned lizard



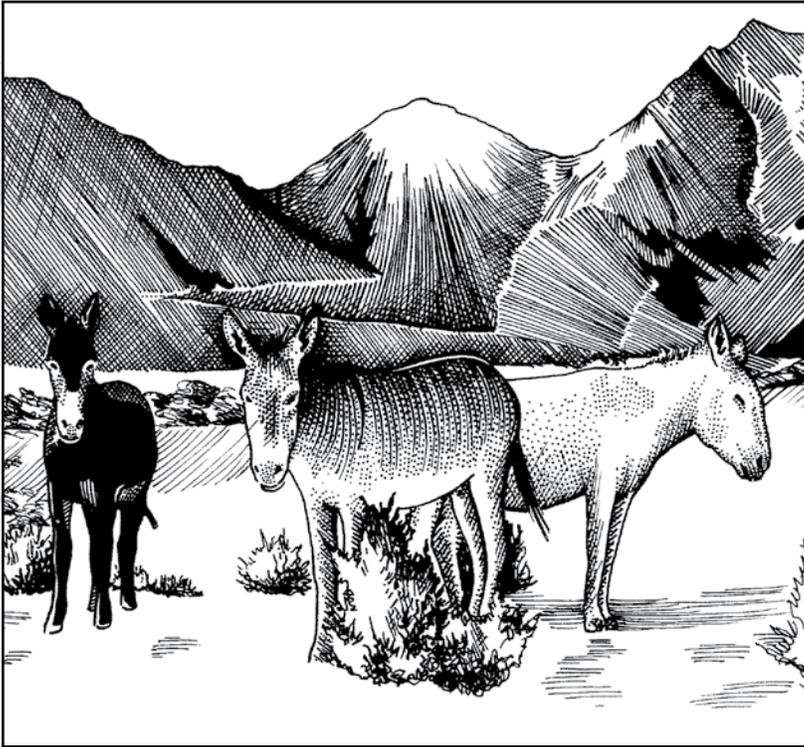
Prairie dog



Salmon

# Horsing Around

When you think about wild animals of the West, you probably think of bears, mountain lions, elk, and deer. But did you know that nearly 50,000 wild horses and burros also make their homes on public lands?



These animals were once domesticated or tame. Many early explorers and settlers in the region used horses or burros to get from place to place and to carry their belongings. Some of the animals escaped from their owners or were set free. The wild horses and burros of the West are descendants of these animals.

The BLM protects wild horses and burros as living symbols of our country's history. It's against the law to harm them. But because they have few natural enemies, there's a danger that their numbers will

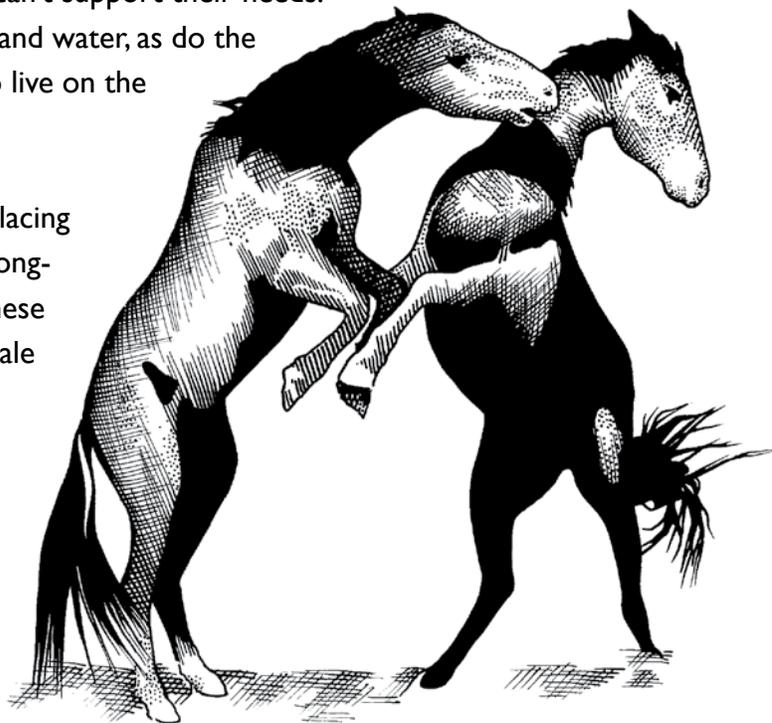
grow to the point where the land can't support their needs.

The horses and burros need food and water, as do the wildlife and grazing cattle that also live on the rangelands.

The BLM manages herd sizes by placing animals in short-term corrals or long-term pastures. The BLM makes these animals available for adoption or sale to qualified people.

## To Find Out More:

Check out the website of the Wild Horse and Burro Program:  
[www.wildhorseandburro.blm.gov](http://www.wildhorseandburro.blm.gov)



# Mustang Roundup

Below is a chart showing the number of wild horses and burros found in some of the western states as of March 2014. (As you can imagine, it's not always easy to count wild horses and burros, so these are estimates.) But the names of the states are scrambled. Can you help? First, unscramble the state names and then put them in the proper blanks on the accompanying map. Then, color the states according to the map key.

**States (scrambled) with the number of wild horses and burros in that state.**

devana—25,035	athu—4,292	drolocao—1,205
myongi—3,771	naaroozi—4,744	antoman—160
raicnilofa—6,008	hodia—668	ewn oxecim—146
gonero—3,180		

**Color Key**

- Less than 1,000 — yellow
- From 1,000 to 4,999 — blue
- From 5,000 to 9,999 — green
- 10,000 or more — red



**—Did You Know...?—**

... that wild ponies can also be found on the East Coast of the United States? They live on islands off the coast of Maryland, Virginia, and North Carolina. To find out more about the ponies and to learn the names of the islands, check out the following National Park Service websites:

[www.nps.gov/asis/naturescience/horses.htm](http://www.nps.gov/asis/naturescience/horses.htm)  
or  
[www.nps.gov/cal/naturescience/horses.htm](http://www.nps.gov/cal/naturescience/horses.htm)

# Energy and Minerals: Public Land Riches

The energy and mineral resources managed by the BLM help to keep our country running smoothly. There's a good chance that the electricity you use every day comes from plants powered by coal or natural gas. America's public lands are important suppliers of these fossil fuels. Some public lands are good locations for developing renewable energy, too. In recent years, companies have built solar energy facilities and wind turbines in many locations, especially in the western states.

In addition to the energy you use, think about all the other things you use every day. From computers to toothpaste to your bicycle—almost every product you can think of contains minerals. Chances are at least some of these minerals came from public lands.

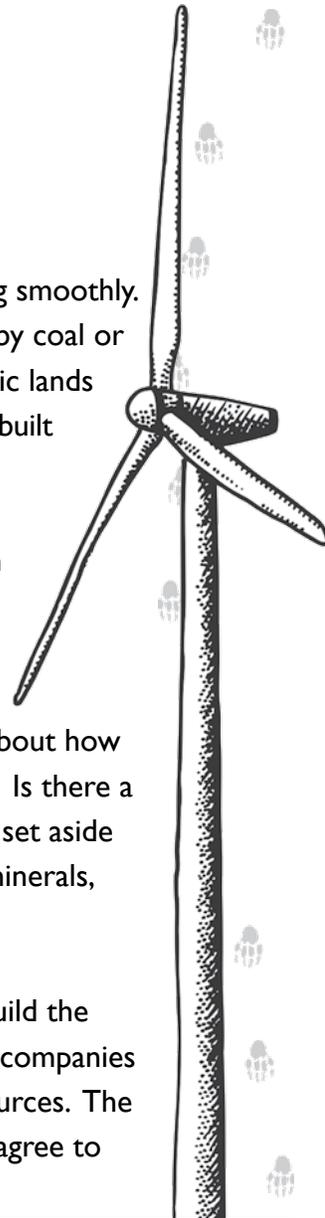
To manage these resources properly, the BLM works with the public to make decisions about how to use the lands. Should we allow a company to mine coal or build a solar power plant? Is there a way to develop energy resources while allowing for other uses? Or should the land be set aside to protect wildlife habitat or to preserve evidence of our past? We need energy and minerals, but we need public lands for many other uses, too.

When the BLM decides to use the land for energy or minerals, it does not actually build the energy installations or extract fossil fuels or other minerals from the earth. Instead, companies get permission from the BLM to use some of the public lands to develop these resources. The companies make payments in return for using the public lands. The companies also agree to follow strict rules that help protect the environment. When it comes to using the rich resources of the public lands, the BLM looks for a balance that will best serve the American public and sustain the health of the land.

## —Stay Out! Stay Alive!—

Some of the biggest hazards on the public lands come from mines that are no longer in use. Abandoned mines pose safety hazards to people visiting public lands. People can get lost or trapped, be overcome by poisonous gases, or fall down a mine shaft. Abandoned mines may also leak dangerous material into the land and water for years. The BLM is working to clean up and close down abandoned mines. In the meantime, if you come across an abandoned mine:

**STAY OUT AND STAY ALIVE!**



# Minerals Match

Do you know how much we rely on minerals? Here's a list of some minerals and other earth materials that Americans use every day, along with some of their uses. Match each of the minerals with the description of how it's used by writing the letter of the mineral in the space next to its description.

Quartz **A**  
 Gold **B**  
 Silver **C**  
 Iron **D**  
 Coal **E**  
 Sand & gravel **F**  
 Phosphates **G**  
 Copper **H**  
 Oil & gas **I**  
 Lead **J**

1. This mineral is burned in power plants to produce most of our country's electricity. \_\_\_\_\_
2. Flexible and shiny, this mineral makes good gutters, pipes, and electrical wiring. \_\_\_\_\_
3. Rings, earrings, watches—many kinds of jewelry are made from this shiny metal. \_\_\_\_\_
4. Used to manufacture steel, this mineral is also found in nails, magnets, and medicines. \_\_\_\_\_
5. This mineral is used in car batteries and ammunition. \_\_\_\_\_
6. These minerals contain phosphorus and are used in fertilizer and food for livestock. \_\_\_\_\_
7. This mineral often occurs in the form of crystals. It comes in many colors and is used to make watches and glass. \_\_\_\_\_
8. Millions of tons of these materials are used in construction projects. \_\_\_\_\_
9. You'll find this versatile mineral in coins, film, mirrors, and jewelry. \_\_\_\_\_
10. These two fossil fuels are often found together in deposits underground. \_\_\_\_\_



# Secret Chambers

You can find natural, historical, and archaeological resources on BLM lands. But not all of them are out in the wide open spaces. Some are deep inside caves. Exploring caves can be fun and exciting. They are full of natural wonders. Cave formations are called **speleothems**. Some speleothems have been growing for hundreds or even thousands of years.

Prehistoric peoples often found shelter in caves. They sometimes left evidence of their lifestyles behind in the form of rock paintings and other artifacts. Caves are also home to a variety of unusual animals. Some of these animals live their entire lives in total darkness. Deep inside a cave, the temperature and humidity never change.

People come from great distances to explore caves on public lands. If they are not careful, though, they sometimes leave their marks behind. Broken formations, muddy footprints, graffiti, and litter can damage a cave's fragile ecosystem. The BLM is responsible for protecting cave resources. It is also responsible for helping visitors understand the risks of visiting caves.

Passages in caves can go for miles, and visitors can become lost or injured. BLM managers sometimes place gates over cave entrances. The gates keep people out, but the openings in the gates are big enough to let in some wildlife, including the caves' most famous residents—bats.

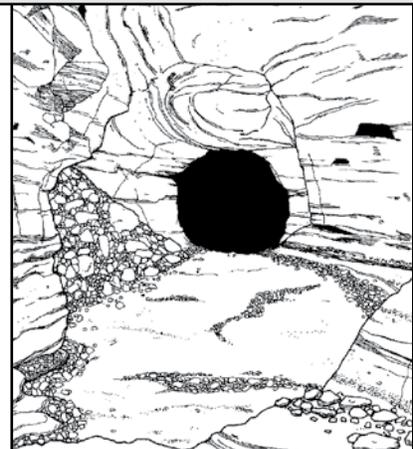
## —Did You Know...?—

... that a single bat can eat thousands of insects in just one night? These flying mammals don't look for their prey in the dark. They send out pulses of sound and then listen for the echoes that bounce off even tiny insects.

## —Calling All Cavers!—

You can visit many BLM caves by obtaining a permit from your local BLM office. Caves can be exciting and fun to explore using very simple equipment. However, exploring caves can also be risky. You have to be aware of your own safety and the protection of things inside the cave, too. Here are some important caving rules:

1. Always tell someone where you are going and when you plan to return.
2. Never go caving alone. It's best to go in groups of three or four.
3. Go with an experienced caver, preferably someone who is familiar with the cave you'll be exploring.
4. Always wear a helmet with an attached light. That way your hands will be free to climb and crawl.
5. Take at least three light sources, with extra batteries and bulbs.
6. Treat cave environments with respect. Remember, they are very fragile environments.



# Cave Pictionary

You can find some weird and amazing sights in caves, and some of them have some pretty weird names, too. Here's a mini cave dictionary, complete with pictures. Why not read the definitions and then draw your own cave with its own wild wonders?

## Cave dictionary:

**stalactite** – a mineral deposit that grows down like an icicle from the ceiling of a cave.

**stalagmite** – a mineral deposit that drips onto the floor of a cave and grows upward.

**troglobite** – an animal that lives its entire life in a cave, often in total darkness. Blind cave fish and cave crickets are troglobites.

**troglophile** – an animal that lives its entire life in a cave, but has no particular adaptations to cave life. Earthworms, scorpions, and various insects can be troglophiles.

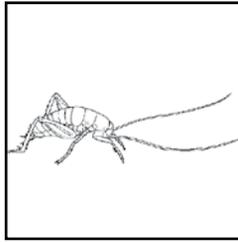
**trogloxene** – an animal that spends part of its life in caves, but leaves to find food. Bats are the most familiar trogloxenes.



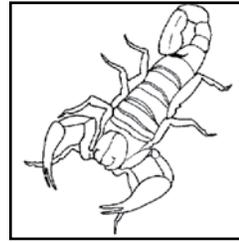
**stalactites**



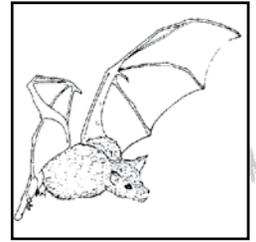
**stalagmites**



**troglobite  
(cave cricket)**



**troglophile  
(scorpion)**

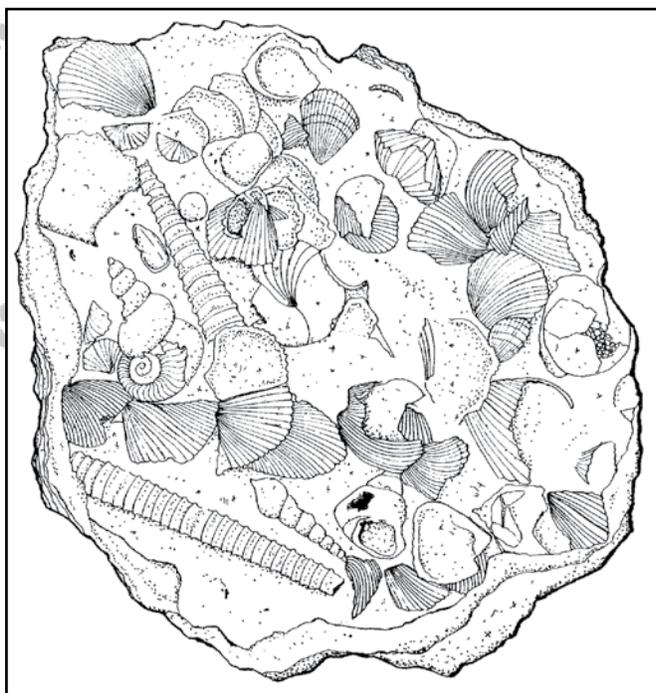


**trogloxene  
(bat)**

# Paleopuzzles

Would you like to follow in the footsteps of a dinosaur? Well, there are places on BLM lands where you can do just that. You won't find any living dinosaurs, of course. They died out long before any humans came along. But you might find fossils of dinosaur bones or tracks. If you do, please leave them in place. But tell someone, because scientists would really like to know about your discovery.

That's because fossils are not so easy to find. Fossil formation is a chancy process (see box at right). Even so, a large number of fossils have been found on BLM lands. In fact, many of the fossils in American museums came from public lands. Fossils belong to all of us, and they can tell us a great deal about ancient climates and landscapes. Did you know, for example, that a shallow ocean once covered large parts of BLM lands in the West? How do we know? From fossils of sea creatures that have been found there. Fossils are the best clues we have as to how life developed on Earth. And that's why it's so important to protect these ancient treasures.



## Making a Good —Impression—

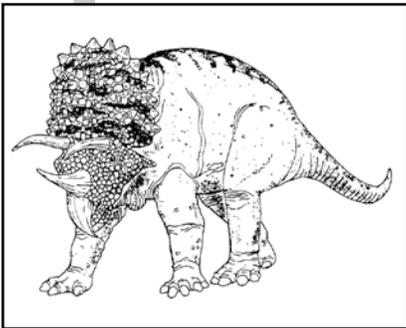
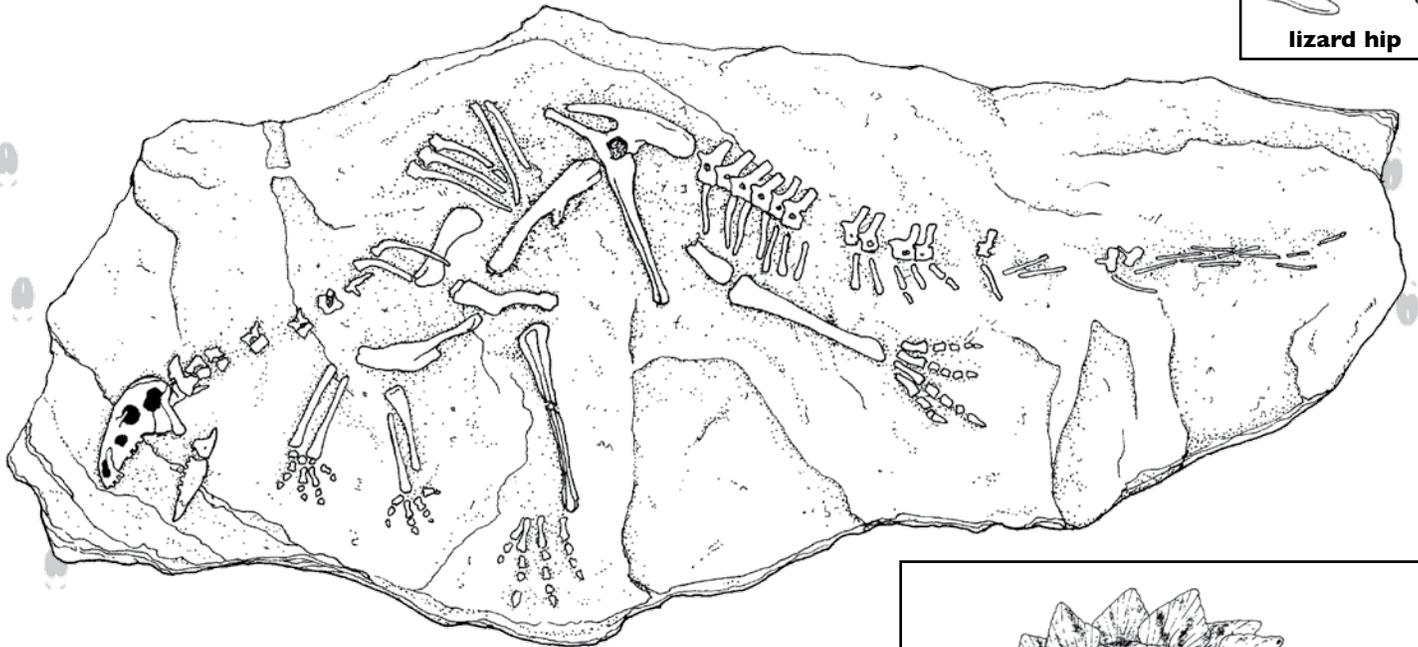
It takes just the right conditions over a long period of time for fossils to form. In the first place, the remains of dead plants and animals have to be buried fairly quickly—perhaps under mud or volcanic ash. Once buried, the remains have to stay undisturbed for a long time. It might take centuries for remains to become petrified. This occurs when living material is replaced by dissolved minerals, which then harden. Fossils can also form by the mold-and-cast process, which occurs when sediments around an object harden. When the object decays, an empty space, or mold, is left. If the mold fills with other sediments, which then harden, a cast is formed.

# Boneyard Mystery

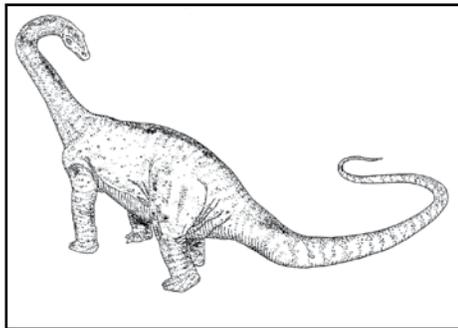
Scientists called paleontologists study fossils. The fossils they find are often all mixed up. There might be bones from several different dinosaurs scattered around a particular site, for instance. Or scientists might find only a few fossilized bones with no trace of the remaining animal. They hardly ever find a complete dinosaur skeleton.

But you're in luck! Paleontologists have sorted through the bones here and put together a dinosaur skeleton. Now it's up to you to figure out what kind of dinosaur it is. Examine the bones and compare them to the drawings of the dinosaurs below. Which one do you think it is? Pay close attention to the skull, the leg bones, and the tail. If you need another hint, check the information about dinosaur hips in the box at right.

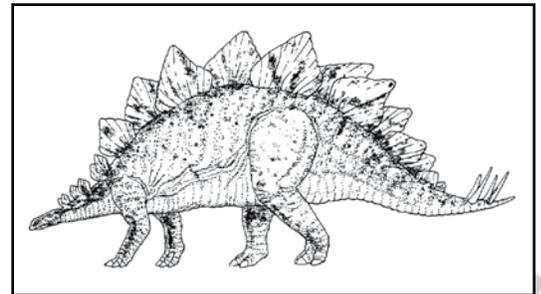
Dinosaurs had hips that resembled either modern-day birds or lizards. Bird-hipped dinosaurs were almost all vegetarians; their teeth were well-suited to eating foliage. Lizard-hipped dinosaurs included all the meat-eaters, as well as the huge plant-eaters such as *Apatosaurus*.



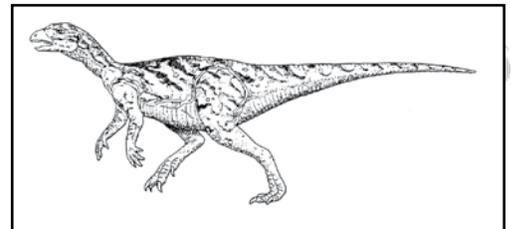
**Pentaceratops**



**Apatosaurus**



**Stegosaurus**



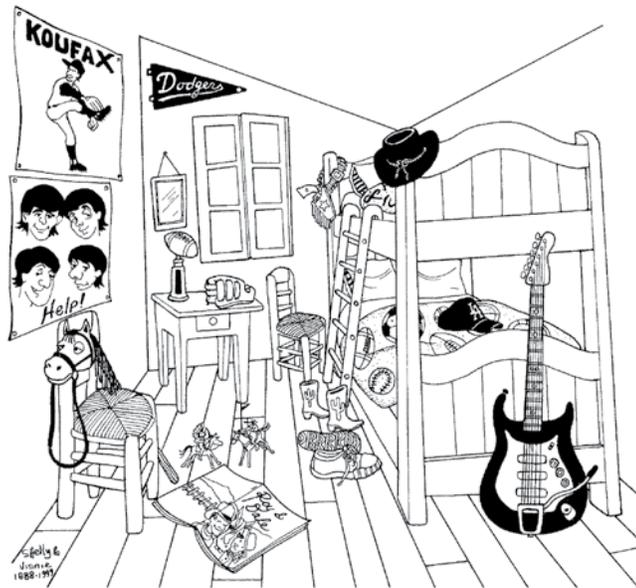
**Hypsilophodon**

# Time Travel

Scientists called archaeologists study clues to human history. You can think like an archaeologist. Imagine that one of the bedrooms on the right is yours. Now imagine that someone who had never met you before saw your bedroom. What could they tell about you, just by seeing your room? Would the person know if you were a boy or a girl? How old you were? If it was during the 1960s or just last year? What your hobbies were?

Archaeologists work the same way. They study a site and look at all the things people left behind. They keep detailed records about everything they find, and handle ancient objects very carefully. They put together hundreds of clues to get the whole story.

But what would happen if some of the clues were missing? Unfortunately, this happens all too often. There are so many archaeological sites on BLM lands that it's impossible to watch over them all. People take things such as arrowheads and pieces of pottery. Sometimes they don't know any better. But sometimes they steal things on purpose to add them to their own collections or to sell them for money. They are taking clues to the past and destroying them forever.

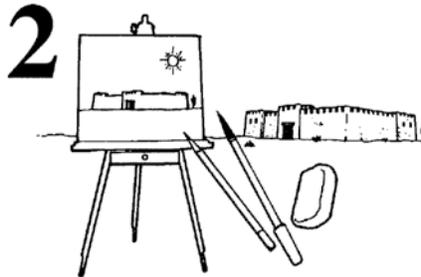


# The Past: Can You Dig It?

Archaeologists are specially trained to uncover clues to human history. Visitors to public lands should never dig up or take ancient artifacts. But there are ways you can help protect clues to the past. Look at the pictures below and circle those actions that you can take to protect clues to America's past. Draw an X through actions that would harm those clues.



Draw graffiti



Paint a picture



Write a story



Spray paint



Take a photo



Bike across



Walk on walls



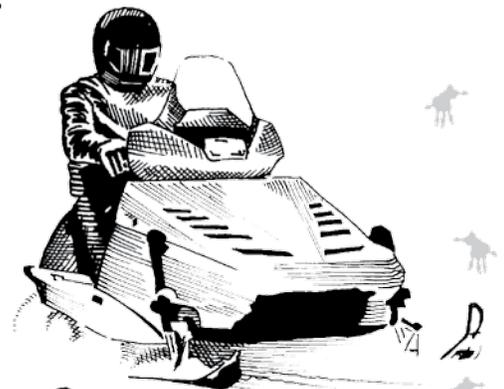
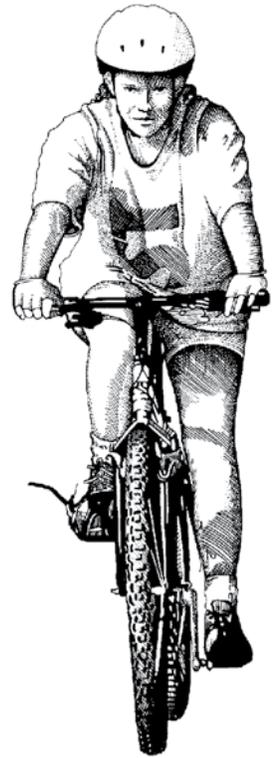
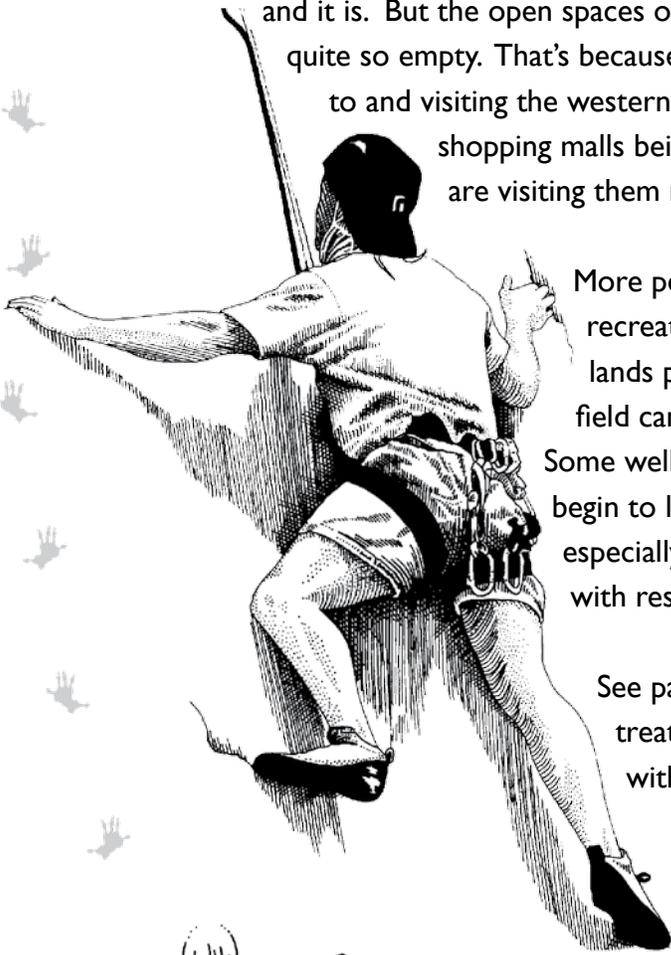
Take objects home

# The Big Squeeze

The BLM manages more than 200 million acres, which sounds like a lot . . . and it is. But the open spaces of our public lands are no longer quite so empty. That's because even more people are moving to and visiting the western states. You won't find houses and shopping malls being built on BLM lands, but people are visiting them more than ever before.

More people are discovering the many recreational opportunities the public lands provide. You know how a soccer field can look after a long, hard season? Some well-used areas of BLM lands can begin to look a little worn out, too, especially if people don't treat the lands with respect.

See page 36 to learn how you can treat our public lands and waters with respect.



# Climbing the Chart

Below is a table showing the estimated number of visits each year to BLM lands and waters over a 10-year period.

Year	Number of Visits <sup>1</sup>
2004	54,035,000
2005	56,118,000
2006	55,420,000
2007	57,349,000
2008	56,940,000
2009	57,358,000
2010	58,570,000
2011	57,755,000
2012	58,070,000
2013	61,670,000

## —Did You Know...?—

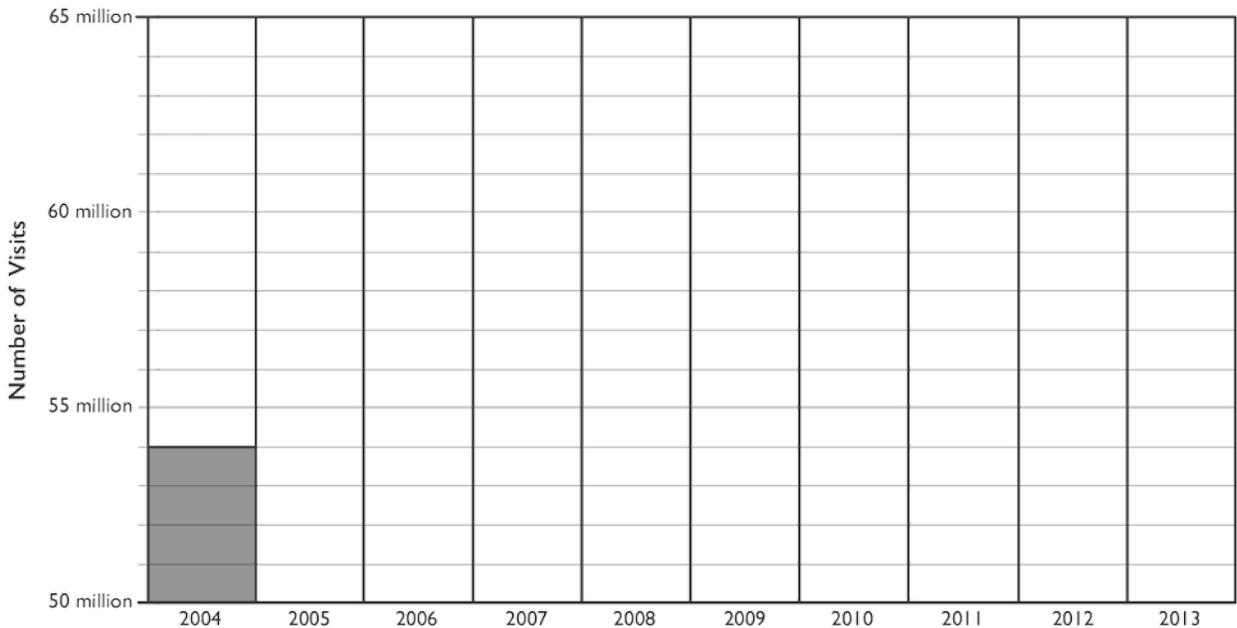
People made approximately 7,600,000 more visits to BLM lands and waters in 2013 than in 2004? That's equivalent to visits from nearly the entire population of New York City or the populations of Chicago and Los Angeles combined!

[Source: U.S. Census Bureau. [http://www.census.gov/2010census/popmap/.](http://www.census.gov/2010census/popmap/)]

<sup>1</sup>As reported in "Public Land Statistics," 2004 through 2013.

Create a bar graph to show the approximate number of visits for each year. Round each number to the nearest million. For example, 54,035,000 is rounded *down* to 54,000,000, or 54 million, and 61,670,000 is rounded *up* to 62,000,000, or 62 million. The first column, for 2004, is done for you.

**Visits to BLM Lands and Waters from 2004 to 2013**



# The Big Picture

You've learned about many of the natural, historic, and prehistoric resources that can be found on BLM lands. And you've learned about some of the many challenges BLM faces in caring for them. When it comes to solving problems—whether they have to do with wildlife or weeds or water—it's important to look at the big picture. That's because everything is connected.

Pick your favorite place on BLM lands. Look around and you'll see signs of many living things . . . and non-living things, too—all of them connected. They are part of what scientists call an ecosystem. There are many ecosystems on public lands—deserts, forests, rangelands, to name just a few. Ecosystems can be large or small. Earth is an ecosystem, and so is your backyard.

## —Watershed Watch—

To learn more about your watershed, check out the “Surf Your Watershed” website of the U.S. Environmental Protection Agency at [www.epa.gov/surf](http://www.epa.gov/surf). Enter your zip code to locate your watershed and learn how you can help protect it.

Ecosystems are one way to look at the big picture. Another way is to look at large areas that are drained by rivers. These are called watersheds. When it rains or when snow melts, the water soaks into the ground or it moves downhill to a body of water—a stream, river, or lake. As the water moves across and through the land, it picks up and carries sediments, minerals, and pollutants. These end up in our groundwater or our waterways.

Like an ecosystem, a watershed can be large or small. In the drawing below, the area outlined by the dotted line is one large watershed. But there are also many smaller watersheds within the big one. No matter what size the watershed is, all living and non-living things within its boundaries are connected.

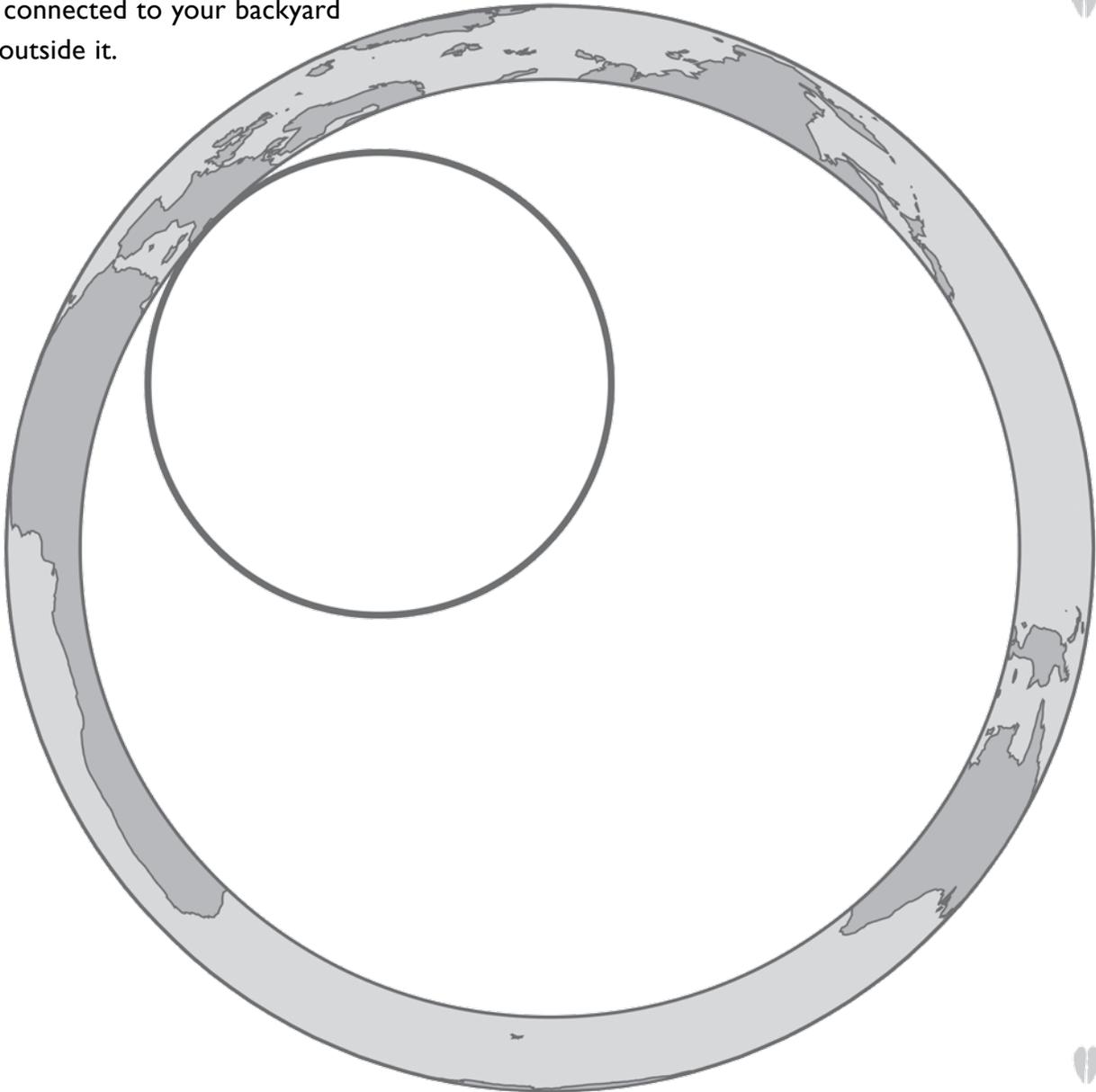
A flower blooms. An insect dies. Wildfire sweeps over the range. The natural world is always changing. Because of all the connections, every change—even the ones you don't notice—will cause other changes. BLM has many experts who monitor changes on BLM lands. By keeping track of them and by looking at the big picture—at watersheds and ecosystems—BLM can do its best to make sure that public lands stay healthy.



# Making Connections

Go outside . . . anywhere. Stop and look. What connections can you find? Chances are you can see plenty of them right in your own backyard, school yard, or local park—a bird eating some berries, perhaps, or a squirrel gathering acorns. Your backyard is a small ecosystem. But does it have connections beyond your backyard? Absolutely! The squirrel might live in a nearby forest. And who knows where the bird might have traveled? Maybe it spends winters in South America or summers in Alaska. It depends on the berries in your backyard for food. But it's also part of the "big picture" that BLM and everyone needs to be aware of.

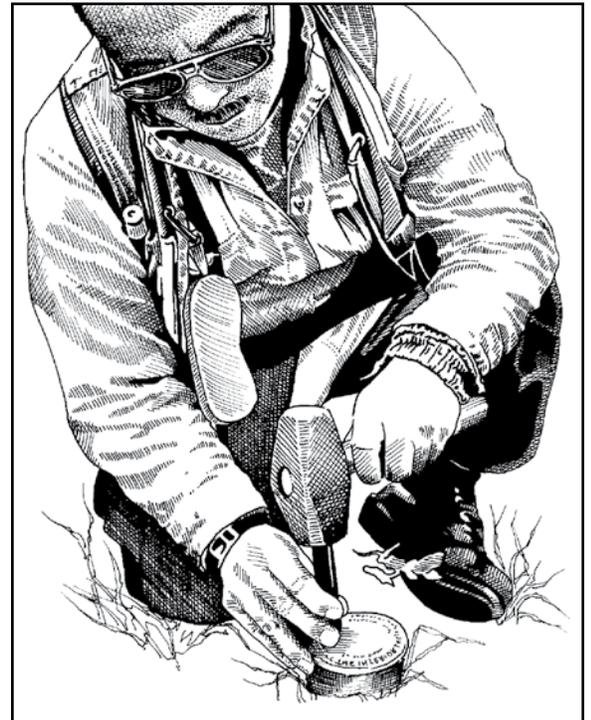
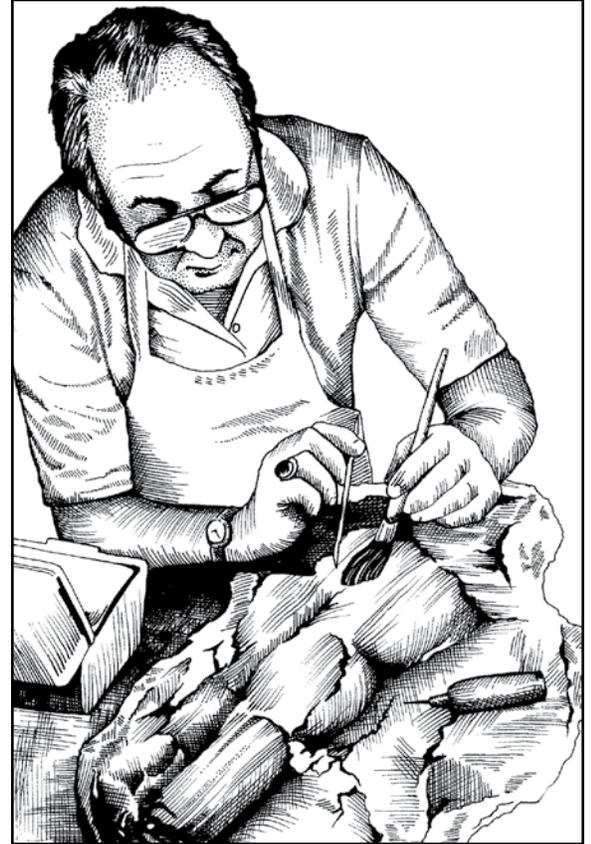
Think about connections. Then draw pictures in the empty circles below. In the small circle, show two or more things in your backyard that are connected. In the larger circle, show some things that are connected to your backyard but are outside it.



# Help Wanted

As you've seen, BLM has huge areas of land to protect and many resources on that land to care for. Experts in many different resources work for BLM. There are experts in minerals, animals, plants, recreation, and many other fields. By working together, BLM employees can do what's best to protect public lands now and in the future.

With so much land to manage, it's a big job. And BLM doesn't just need experts to do it. All sorts of people can help. As you've seen, people create some of the problems that exist on BLM lands, and people can also help solve them. In other words, BLM needs YOU! After all, as you've learned, public lands belong to all Americans, and that means everyone can help care for them.





# Doing Your Part

There are things everyone can do to help care for BLM lands when they visit. Follow the Leave No Trace Principles ©, listed below. You can learn more about how to Leave No Trace by visiting the website at [www.lnt.org](http://www.lnt.org).

## 1. Know Before You Go

Know the rules and learn about the area you'll be visiting.

## 2. Choose the Right Path

Using hard surfaces prevents damage to soil and plants. Hard surfaces are established trails and campsites, rock, gravel, dry grasses, and snow.

## 3. Trash Your Trash

Use trash cans for your garbage. If you are visiting an area where there are no trash cans, then take all trash away with you, including leftover food, litter, and toilet paper, in a sealed plastic bag. Human waste should be buried in a small hole 6-8 inches deep and at least 200 feet from water, camp, and trails.

## 4. Leave What You Find

Leave rocks, plants, arrowheads, and other objects so that others can enjoy them, too. Do not build structures or dig trenches.

## 5. Be Careful With Fire

Use a lightweight stove for cooking and enjoy a candle lantern for light. Where fires are allowed, use fire rings that are already there and keep fires small. Only use sticks from the ground that can be broken by hand. Be sure to burn all wood and coals to ash, put out campfires completely, and then scatter cool ashes. Adults should always be involved in building, burning, and putting out campfires.

## 6. Respect Wildlife

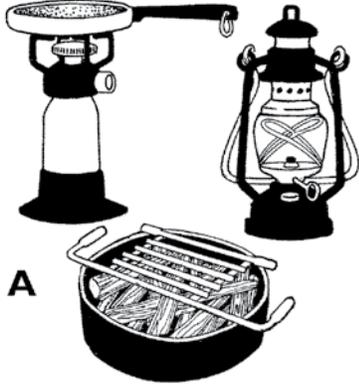
Watch wildlife from a distance and don't follow or approach animals. Never feed animals. Control pets at all times, or better yet, leave them at home.

## 7. Be Kind to Other Visitors

Respect other visitors and remember that they want to enjoy the outdoors, too. Take breaks and make camps away from trails and other visitors. Let nature's sounds—not radios or music players—be the ones heard. Avoid loud voices and noises.

# Leave No Trace

To the left and to the right are some pictures illustrating the Leave No Trace Principles. Draw a line from each of the principles in the center to the picture that best illustrates it.



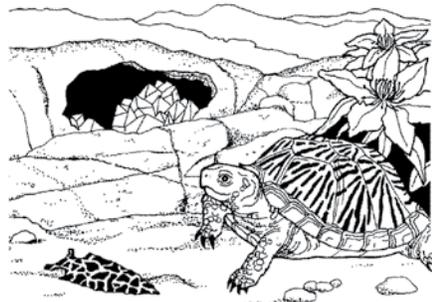
A



B



C



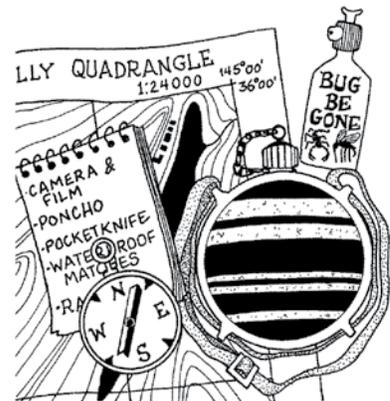
D



G



F



E

1. Know Before You Go
2. Choose the Right Path
3. Trash Your Trash
4. Leave What You Find
5. Be Careful With Fire
6. Respect Wildlife
7. Be Kind to Other Visitors

**So you'll always remember:**

Make a small wallet card of the Leave No Trace Principles or order one from the LNT website ([www.lnt.org](http://www.lnt.org)). Carry it with you so you'll remember how to take good care of BLM lands and all the lands you might visit.

# Answers to Activity Pages

## pp. 4 and 5 Map Talk

Answers will vary, depending on the state in which you live. Among the states that have a lot of BLM land are Alaska, Nevada, Utah, and Wyoming.

## p. 7 I Spy Scramble

fish, birds, mammals, reptiles, insects, flowers, trees, mountains, deserts, glaciers, rivers, caves, oil wells, fossils, arrowheads, wind turbines. Answer to question: shopping malls

## p. 11 Where's Weedo?

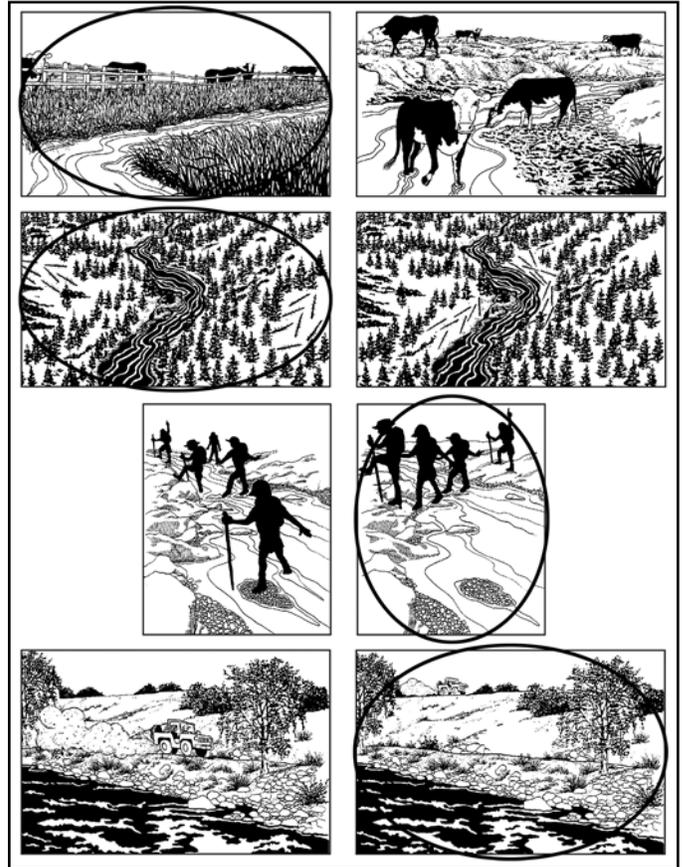


- (1) Leafy spurge (*Euphorbia esula*)
- (2) Garlic mustard (*Alliaria petiolata*)
- (3) Dalmatian toadflax (*Acroptilon repens*)
- (4) Russian knapweed (*Linaria dalmatica*)

## p. 13 Little House Near the Wildlands

Hazards include: hole in chimney; leaves and branches on roof; logs stacked near house; gasoline near house; car; tall grasses, and weeds near house; debris in yard; tree hanging over roof

## p. 15 Down by the Riverside

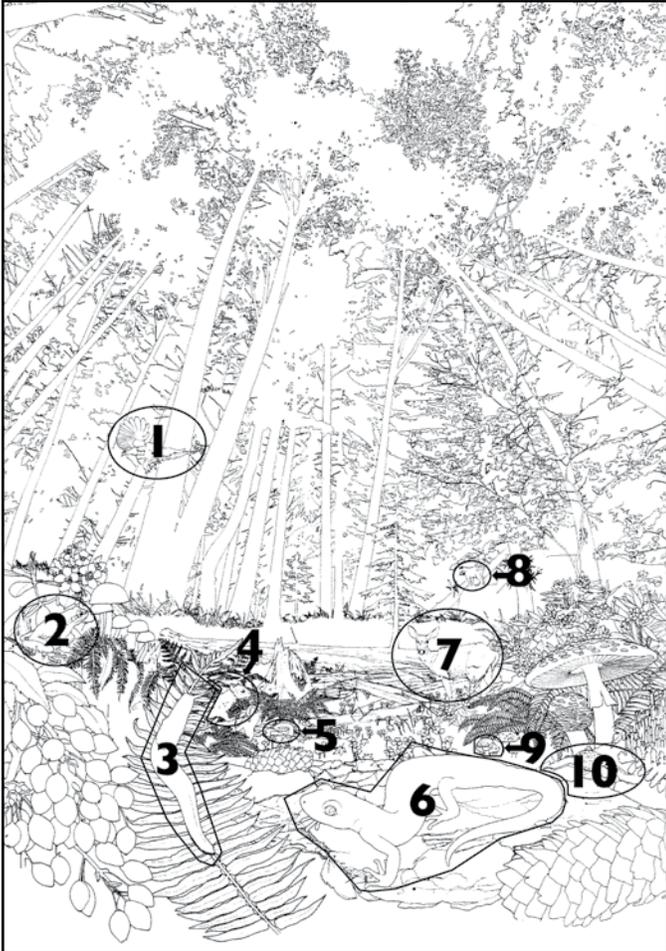


Activities that help protect riparian areas:

- (1) cattle fence to keep cows away from riparian areas
- (2) logging of only a few trees far from the river
- (3) hikers crossing stream in a single file
- (4) road built far back from water

# Answers to Activity Pages (continued)

## p. 17 Finding Forest Friends



- |            |                |             |
|------------|----------------|-------------|
| (1) owl    | (5) snake      | (8) bobcat  |
| (2) frog   | (6) salamander | (9) vole    |
| (3) slug   | (7) deer       | (10) beetle |
| (4) marten |                |             |

## p. 19 Habitat Match-up

- |                      |                             |
|----------------------|-----------------------------|
| (1) bear – forest    | (4) lizard – desert         |
| (2) caribou – tundra | (5) prairie dog – grassland |
| (3) frog – wetland   | (6) salmon – stream         |

## p. 21 Mustang Roundup

Nevada – 25,035	Utah – 4,292	Colorado – 1,205
Wyoming – 3,771	Arizona – 4,744	Montana – 160
California – 6,008	Idaho – 668	New Mexico – 146
Oregon – 3,180		

Yellow: Idaho, Montana, New Mexico

Blue: Utah, Arizona, Oregon, Colorado, Wyoming

Green: California Red: Nevada

## p. 23 Minerals Match

- 1.E 2.H 3.B 4.D 5.J 6.G 7.A 8.F 9.C  
10. I

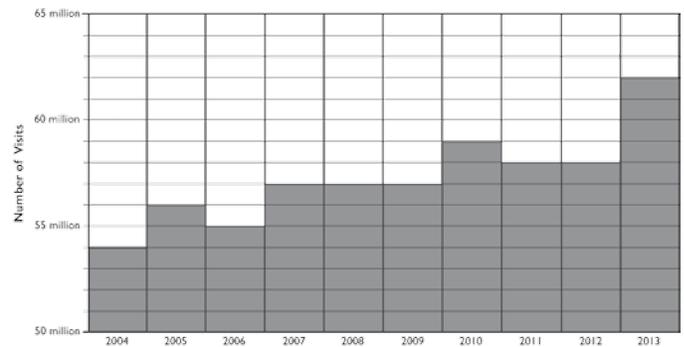
## p. 27 Boneyard Mystery

Hypsilophodon

## p. 29 The Past: Can You Dig It?

Numbers 2, 3, and 5 should be circled. Numbers 1, 4, 6, 7, and 8 should be crossed out.

## p. 31 Climbing the Chart



## p. 35 Career Fair

- |                    |                   |                  |
|--------------------|-------------------|------------------|
| 1. Forester        | 2. Surveyor       | 3. Archaeologist |
| 4. Fire Specialist | 5. Hydrologist    | 6. Biologist     |
| 7. Ranger          | 8. Paleontologist | 9. Botanist      |
| 10. Geologist      |                   |                  |

Answer to question: Everyone is!

## p. 37 Leave No Trace

- 1.E 2.F 3.C 4.D 5.A 6.G 7.B





**U.S. Department of the Interior  
Bureau of Land Management**