

# *My Public Lands*

## **Native Plants**

**JUNIOR  
RANGER**



**Amazing  
Adaptations**

**AN INVADER  
THREATENS  
SAGEBRUSH**



**Bureau of  
Land Management**

# What's Inside

- Plants and Public Lands . . . 2
- Benefits of Native Plants . . 3
- Amazing Adaptations . . . . 4
- Ecosystem Give and Take . . . . . 6
- Weaving the Wild . . . . . 8
- Native Plants Under Threat . . . . . 9
- An Invader Threatens Sagebrush . . . . . 10
- Characterize the Career . . 12
- Be a Good Steward . . . . . 13
- Build a Trail . . . . . 14
- Take a Break and Make Like a Tree . . . . . 16

# Public Lands

The BLM manages  
**245 MILLION ACRES**

More than  
**99%**  
of BLM-managed  
lands are open for  
recreation

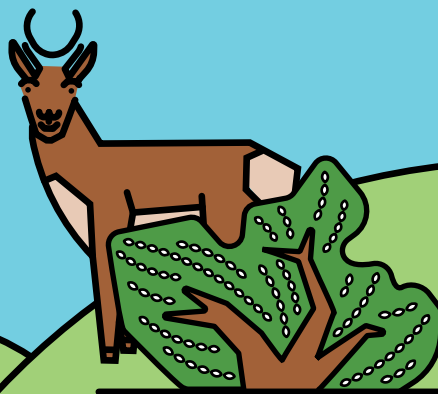
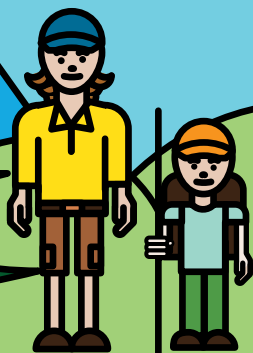
**Become a BLM Junior Ranger!**  
The Junior Ranger program introduces young adventurers like you to the lands and resources of the Bureau of Land Management. We invite you to join the adventure! Learn more at [blm.gov/education](http://blm.gov/education).



# Belong to You!

More than **80 MILLION VISITS**

each year to BLM-managed lands



1

Find Junior Ranger activities at over **50 LOCATIONS**

The Bureau of Land Management (BLM) is a federal government agency that cares for public lands. These lands are managed for many different uses and belong to all Americans.

BLM lands provide energy resources, such as coal, oil, and natural gas. They provide habitat for wildlife, food for grazing animals, and timber for people. The lands contain evidence of the past, such as dinosaur bones and plant fossils. Archaeological sites help us learn about and co-manage the lands with the Indigenous peoples who have lived here for thousands of years. You, too, are encouraged to explore, learn about, and help take care of BLM lands!



Energy



Forestry



Wild Horses & Burros



Grazing



Education



Conservation



Fire



Recreation



Cultural Resources

# Plants and Public Lands

Native plants are plants that grow naturally in a particular area or **ecosystem**. Over time, these plants have **evolved** and **adapted** to the soils and **climate** as well as to other native plants and animals. Nonnative plants are plants from other areas that are introduced into different ecosystems.

In their ecosystems, native plants fill a particular role, or **niche**. For many animals, they provide food, shelter, and nesting places. The leaves of native plants remove harmful substances from the air. Plant roots absorb water from soil. This reduces

**erosion** and pollution. Green plants use carbon dioxide, water, and sunlight to make oxygen and the sugar needed for energy. Some plants then become food for animals and people.

Our public lands are wonderful places to enjoy beautiful scenery and view a wide variety of native plants. In this booklet, you will explore some of the native plants found on BLM public lands. You will learn how they benefit other native plants, animals, and the environment. In addition, you will examine some threats to native plants. And you will discover what the BLM is doing to help.

2

What is the name of a park or public land area near your home?

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## WORDS TO KNOW

- **ecosystem:** community of interacting living things
- **evolve:** change over time
- **adapt:** adjust to the environment
- **climate:** typical weather conditions in a certain place over many years
- **niche:** role and place for a living thing in an ecosystem
- **erosion:** process of wearing away by water or wind

# Benefits of Native Plants

Over thousands of years, native plants evolve with the animals, including humans, in an ecosystem. The ecosystem provides sunlight, water, carbon dioxide, and nutrients for the plants. In turn, native plants add beauty to our landscapes along with other benefits.

Explore the picture below to see many ways native plants benefit the environment, and then consider how you benefit from plants by answering the questions to the right.

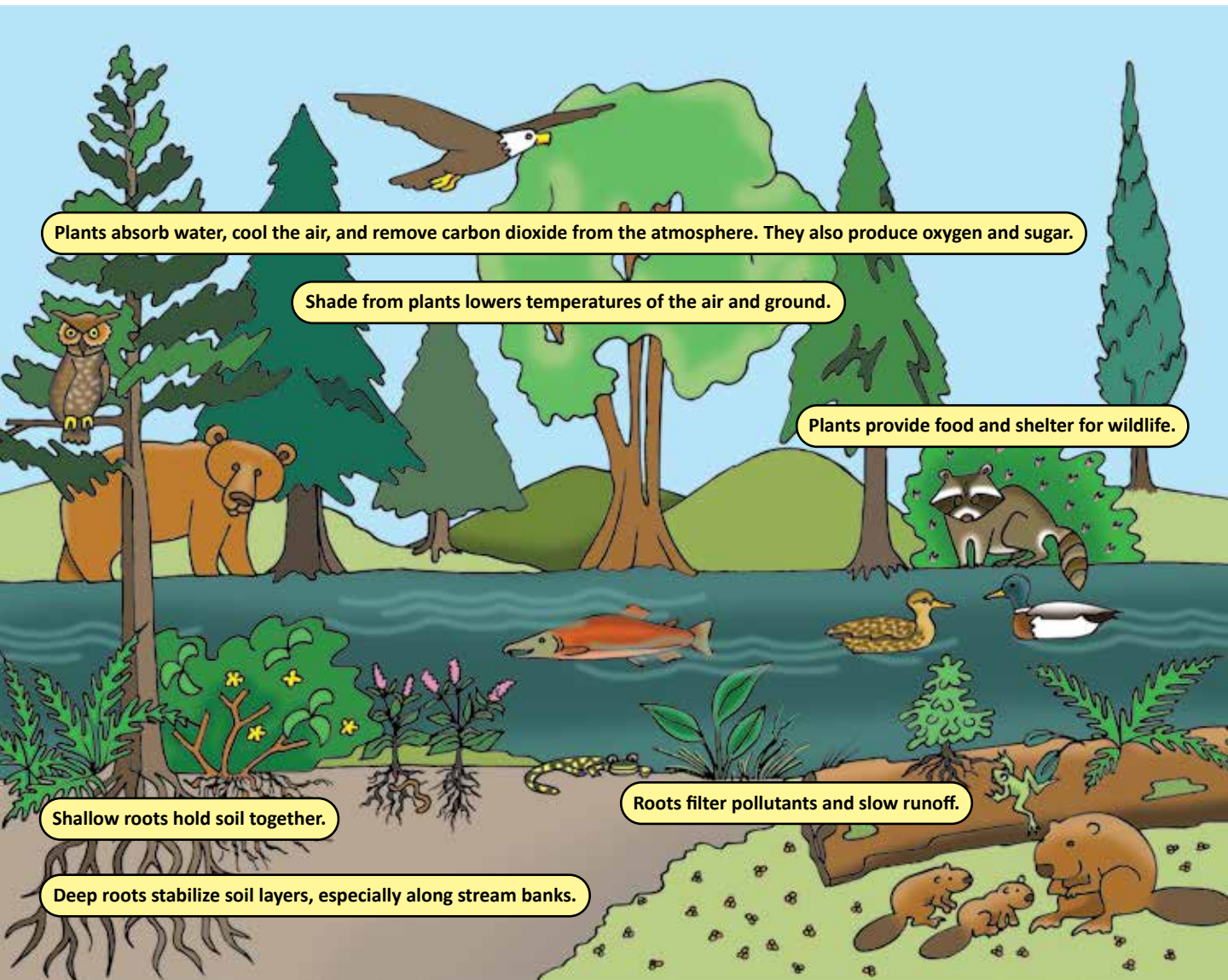
What foods do you like to eat that contain sugars grown by plants?

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3

How do plant roots affect the soil near your home?

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Plants absorb water, cool the air, and remove carbon dioxide from the atmosphere. They also produce oxygen and sugar.

Shade from plants lowers temperatures of the air and ground.

Plants provide food and shelter for wildlife.

Shallow roots hold soil together.

Roots filter pollutants and slow runoff.

Deep roots stabilize soil layers, especially along stream banks.

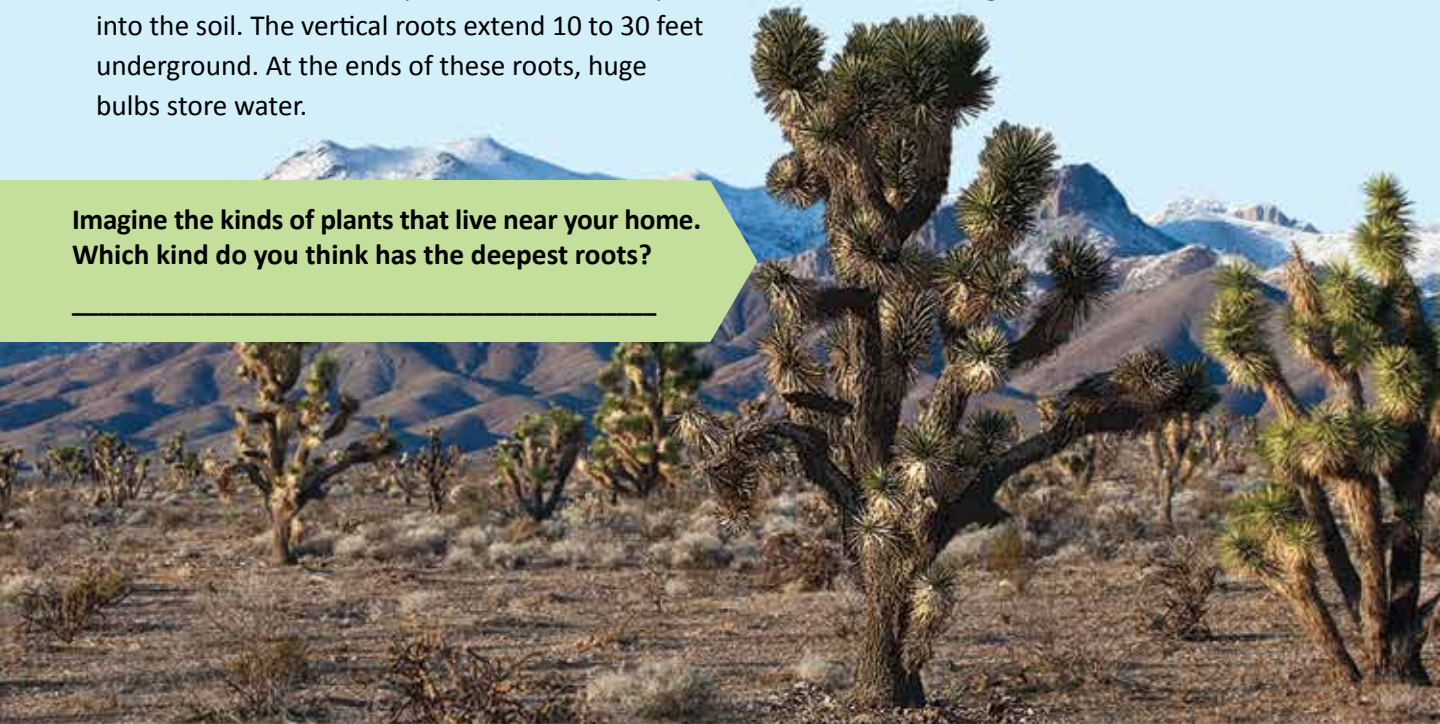
# Amazing Adaptations

**Native plants living on public lands have incredible adaptations that allow them to survive in their ecosystems.**

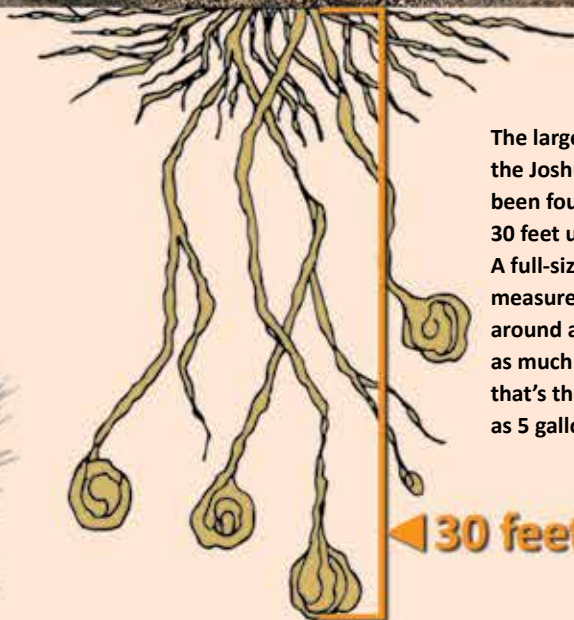
The Mojave Desert is one of the hottest and driest places on Earth. Temperatures can top 100° F. In a typical year, it rains less than 10 inches. (In contrast, Hawaii's Mt. Waialeale gets about 450 inches of rain in a year!) To survive in the desert, some native plants have developed unique ways to collect and store water. One such plant is the Joshua tree. The Joshua tree has specialized roots for collecting and storing water. The shallow roots spread out horizontally over a wide area, collecting rare rainwater that soaks into the soil. The vertical roots extend 10 to 30 feet underground. At the ends of these roots, huge bulbs store water. The shallow roots spread out horizontally over a wide area, collecting rare rainwater that soaks into the soil. The vertical roots extend 10 to 30 feet underground. At the ends of these roots, huge bulbs store water.

4

**Imagine the kinds of plants that live near your home. Which kind do you think has the deepest roots?**



The Joshua tree is the dominant native plant species in some parts of the Beaver Dam Wash National Conservation Area in Utah.



The large root bulbs of the Joshua tree have been found as deep as 30 feet underground. A full-sized bulb can measure up to 4 feet around and can weigh as much as 40 pounds... that's the same weight as 5 gallons of water!



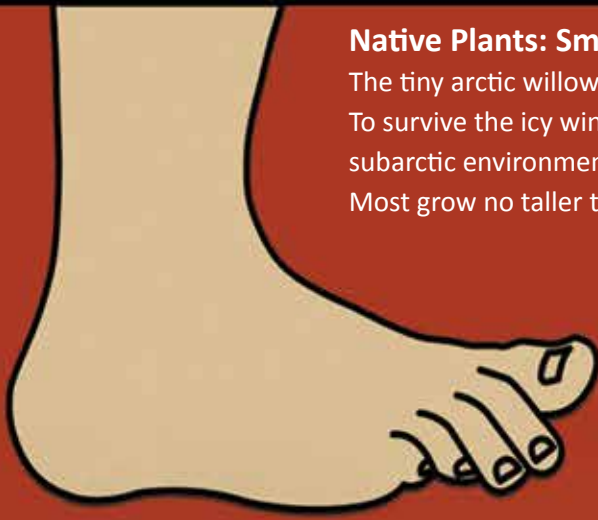
# Amazing Adaptations (continued)

## Native Plants: Small...

The tiny arctic willow rarely reaches 6 inches in height. To survive the icy winds and extreme cold of arctic and subarctic environments, it grows close to the ground. Most grow no taller than half an inch.

Is that shorter or taller than your big toe?

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## ...To Tall

The tallest trees in the world are the coastal redwoods of northern California. They can reach heights of more than 350 feet. They live for hundreds, even thousands of years. One tree can soak up as much as 150 gallons of water in 1 day.

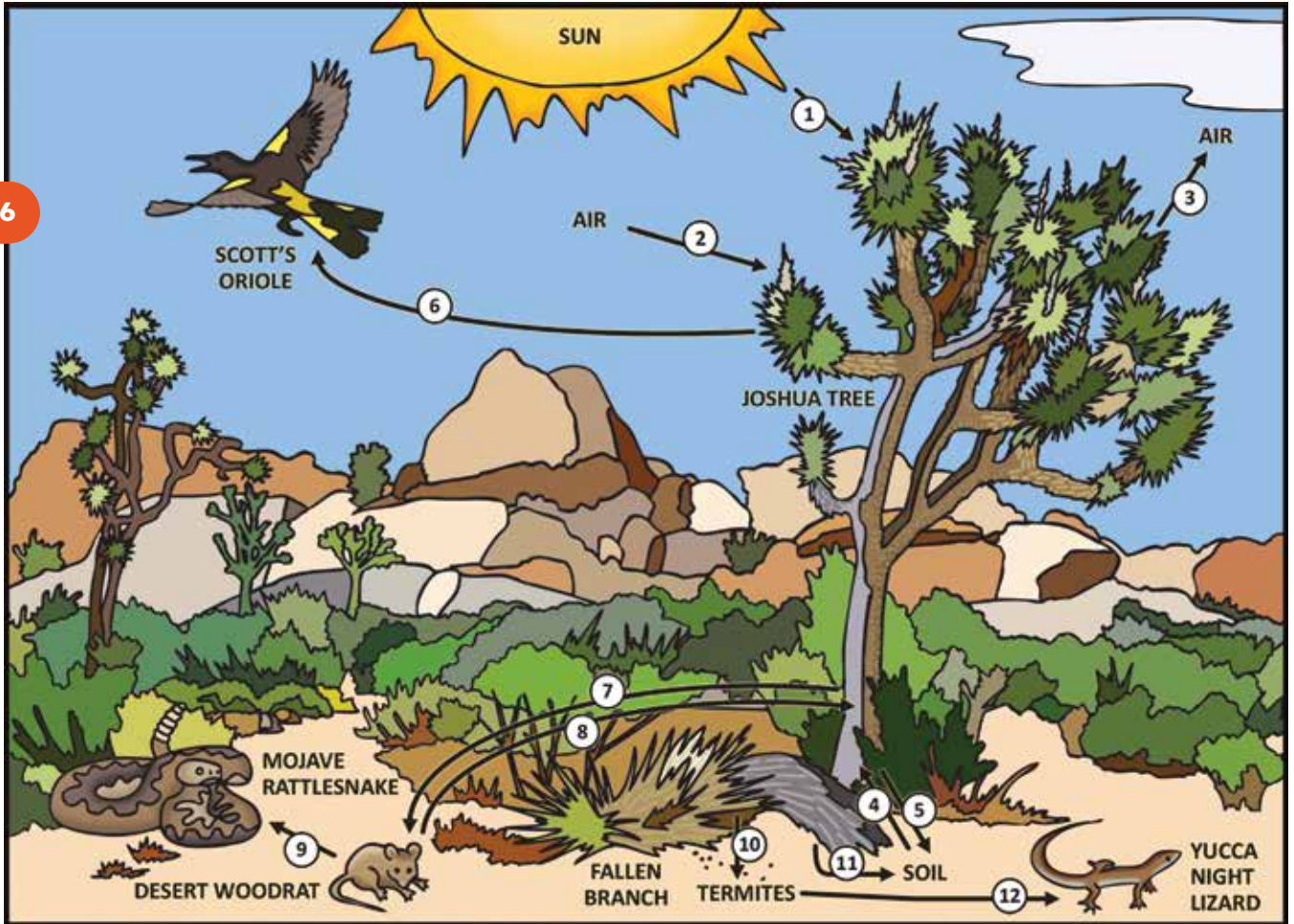
An average amount of water used to take a bath is 30 gallons. How many baths of water is 150 gallons?

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Fog covers these coastal redwoods at Headwaters Forest Reserve in California. Nearly half of the water needed by these giant trees is absorbed through their leaves from the fog.



# Ecosystem Give and Take



The Red Rock Canyon National Conservation Area in the Mojave Desert is home to the Joshua tree. This unique plant provides habitat for a host of desert creatures. Birds nest in its branches. Small desert mammals find shelter in its shade. Animals, including people, use the seeds for food. The roots of the Joshua tree stabilize the soil.

In return, the Joshua tree takes what it needs from the ecosystem, such as carbon dioxide and moisture from the air. From the soil, it takes

nutrients and more water. The animals that depend on the tree help out, too. For example, small mammals help spread, or disperse, the seeds so more Joshua trees will grow.

Many more exchanges take place in this ecosystem. Termites feed on fallen branches and speed up their decay. Decaying branches give nutrients to the soil. Lizards feed on the termites before becoming food for snakes.



# Ecosystem Give and Take (continued)

**Directions:** Using the information from the previous page, complete the sentences below using words from the word bank. Some words will be used more than once.

**WORD BANK:**

food  
nutrients  
nesting site

shelter  
oxygen  
disperses

moisture  
energy  
water

stabilizes  
carbon dioxide

7

- 1 The sun transfers \_\_\_\_\_ to the Joshua tree.
- 2 The air gives \_\_\_\_\_ and \_\_\_\_\_ to the Joshua tree.
- 3 The Joshua tree releases \_\_\_\_\_ to the air.
- 4 The soil provides \_\_\_\_\_ and \_\_\_\_\_ to the Joshua tree.
- 5 In return, the Joshua tree \_\_\_\_\_ the soil with its roots.
- 6 The Joshua tree provides a \_\_\_\_\_ for a Scott's oriole.
- 7 The Joshua tree gives \_\_\_\_\_ to a desert woodrat.
- 8 In exchange, the desert woodrat \_\_\_\_\_ the seeds of the Joshua tree.
- 9 The rat might become \_\_\_\_\_ for a Mojave rattlesnake.
- 10 A dead branch of the Joshua tree becomes \_\_\_\_\_ for termites.
- 11 As the branch decays it gives \_\_\_\_\_ back to the soil.
- 12 Later, the termites might become \_\_\_\_\_ for a yucca night lizard.

**What are three ways that people of the past and today might interact with this ecosystem?**

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The relationship between the yucca moth and the Joshua tree is an example of interdependence. The moth is the tree's only pollinator. And the tree is the only place where the moth can lay her eggs. The two cannot survive without each other.



Photo by Alan Cressler  
(USDA Forest Service)

# Weaving the Wild

Native plants were and are essential to Indigenous peoples. For example, members of the Paiute Tribe have long used willow branches to weave baskets for carrying water, food, and more. This Kaibab Paiute Tribal member, Angelita Bullets, is weaving a traditional cradle board from native willow branches. She helps pass on the art and tradition of using and respecting natural materials in our everyday lives.

Ask an elder from your family or community about a plant that is special to them. What do they call it? Where do they find it? Why is it special to them?

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# Native Plants Under Threat

Healthy native plant communities are essential to the health of our public lands. North America is home to nearly 20,000 native plant species. Unfortunately, over the last two centuries more than 200 native plant species in the United States have disappeared. Another 5,000 native species are at risk.

Native plants are under attack from a variety of threats, including wildfires, construction, pollution, and climate change. Another very serious threat to native plants is nonnative plants.



When nonnative plants are introduced to an area, they compete with native plants for space and for resources such as water, soil, and sunlight. Nonnatives are often resistant to diseases that kill native plants. In addition, nonnatives are often less appetizing to animals that eat plants. This gives nonnative plants a huge competitive advantage that allows them to crowd out native plants. When this happens, nonnative plants become invasive plants.

Thousands of acres of our public lands are being impacted by invasive plants. As invasive plants take over an area, native plants disappear, and animals lose important habitat. Native Americans and other residents who rely on native plants for food, medicine, and inspiration are also negatively affected.

**What is the name of an invasive plant that grows near your home?**

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Native lupine blooms near the BLM Trinity Wild and Scenic River in California. Wildlife eat both the leaves and the seeds of this native plant. Lupine also attracts butterflies and hummingbirds.

Spotted knapweed covers a Utah field in pink. While it might look pretty, this invasive plant has replaced native grasses and wildflowers.



# An Invader Threatens Sagebrush

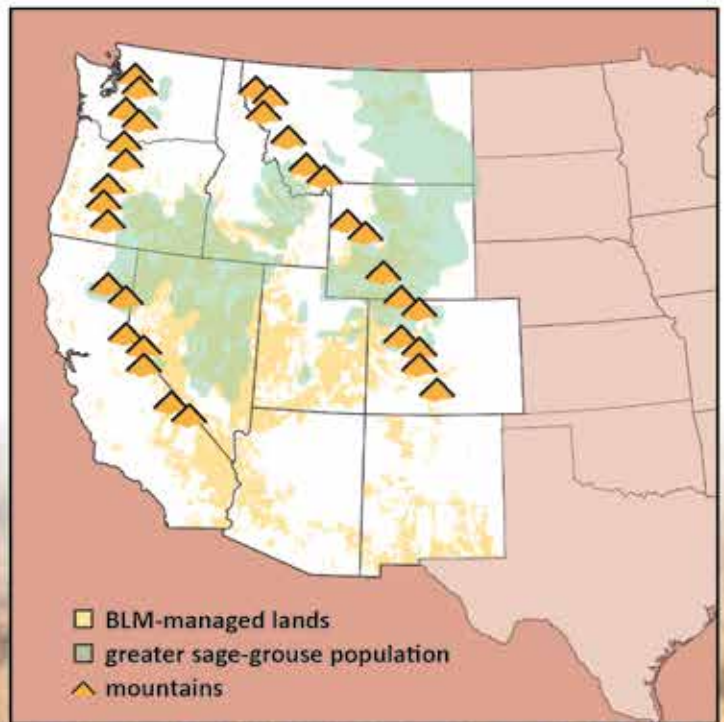
Sagebrush is a type of native plant found in deserts and other arid lands. Eleven western states have large regions known as sagebrush steppe where sagebrush is the most common, or dominant, plant.

**10** More than 20 different kinds of sagebrush, from 1 to 10 feet in height, grow in the sagebrush steppe. With hairy leaves for insulation and complex roots, sagebrush is perfectly suited to hot, dry summers, cold winters, and strong winds.

Sagebrush is an important plant for humans. Native Americans have long used it to make medicines that relieve pain. Sagebrush is also a symbol of beauty and connection of the land for many people of the Western United States.

For a variety of wildlife—such as pygmy rabbits, pronghorns, sagebrush lizards, and golden eagles—sagebrush steppe

is home sweet habitat. Some animals, such as the greater sage-grouse, depend entirely on sagebrush. During the winter, this ground-dwelling bird eats sagebrush leaves and buds. In the spring, males perform courtship displays in open areas surrounded by sagebrush. Females build their nests and raise their young among the sagebrush. Without sagebrush, the greater sage-grouse cannot survive.



**What native plant do you associate with your home?**

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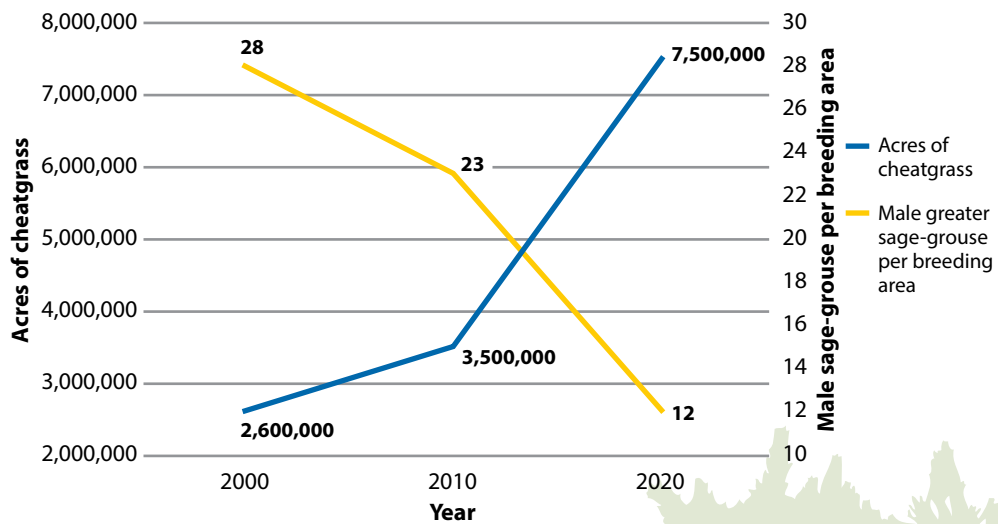


# An Invader Threatens Sagebrush (continued)

Sagebrush is quickly being driven out of its habitat by an invasive plant called cheatgrass. Cheatgrass outcompetes native plants in areas where the ground has been disturbed by human land use or wildfire. It burns easily and often, making it almost impossible for the slower growing sagebrush to regrow.

Examine this graph to see how cheatgrass and sage-grouse populations changed in the state of Nevada between 2000 and 2020:

### Cheatgrass and sage-grouse population trends in Nevada, 2000–2020



How many fewer sage-grouse males were present per breeding area in 2020 compared to 2000?

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How many more acres of cheatgrass were there in 2020 compared to 2000?

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Do you think there is a relationship between these trends? Why?

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The BLM works to protect native species. What is one thing you might suggest the BLM do to protect greater sage-grouse and its sagebrush habitat?

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# Characterize the Career

The BLM is entrusted with the care of America's public lands. BLM employees have different jobs, but we all work toward keeping native plants and their habitats healthy for people now and forever. Draw a line from each job description to the type of professional who usually does this job. Place a checkmark in the circles next to the jobs that you might like to have someday.

12

## Duties

Studies plants, animals, and their habitats in order to help protect them.

Keeps buildings safe and clean for visitors.

Maintains a healthy environment for plants that livestock like cows and sheep use for food.

Communicates and collaborates with Indigenous peoples who call BLM lands home.

Plans for, prevents, and manages wildfires for public safety.

Manages forests as healthy wildlife habitats and for timber.

Helps the public understand what makes BLM lands special.

Designs and manages safe buildings and roads.

## BLM Job Titles

- educator
- Tribal liaison
- maintenance worker
- engineer
- forester
- biologist
- fire technician
- rangeland management specialist

What other jobs might be needed to manage public lands?

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# Be a Good Steward

As a Junior Ranger, you have a role in protecting native plants. Like the people who work for the BLM, you can be a steward of public lands.

Land stewardship means protecting and being responsible for land and property. To be good land stewards, we practice Leave No Trace. That means we make the best choices we can to help protect wildlife, plants, cultural heritage, and the natural world.

13

Here are some ways you can protect native plants by practicing Leave No Trace:

1. **Stay on the trail.** Wear shoes that can get dirty or wet in case you encounter mud or water on the trail. Going around wet areas can damage plants along the trail's edge.
2. **Leave what you find.** Do not pick wildflowers or other plants. Bring a camera so you can collect pictures. Leave the area as you found it for others to enjoy.
3. **Trash your trash.** Bring something to carry out your trash.

## Know before you go...

The key to a safe outing is what you do before you leave home. Learn all you can about your destination. It will help make the trip more enjoyable, and you will be prepared to minimize your impact on the environment.

For more information, visit the **Leave No Trace** website: [www.LNT.org](http://www.LNT.org)



What is something you've done recently to help protect the environment?

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# Build a Trail

Imagine that you are planning a new hiking trail for the BLM in an area with beautiful scenery, a wetland, and a lake. This area is home to important native plant communities and wildlife habitat, including a nesting site and a birthing area for deer and pronghorn antelope. The trail will guide hikers from a trailhead to a picnic area and campground.

14

Building a trail could impact important features of the environment, including the nesting site and birthing area. In addition, a new trail could break up, or fragment, native plant communities and wildlife habitat.

Your job is to plan a trail to provide a variety of outdoor recreation activities, including hiking, viewing plants and wildlife, swimming, enjoying scenic views, picnicking, and camping. At the same time, you want to minimize the possible harm to the environment. See the directions on the next page.

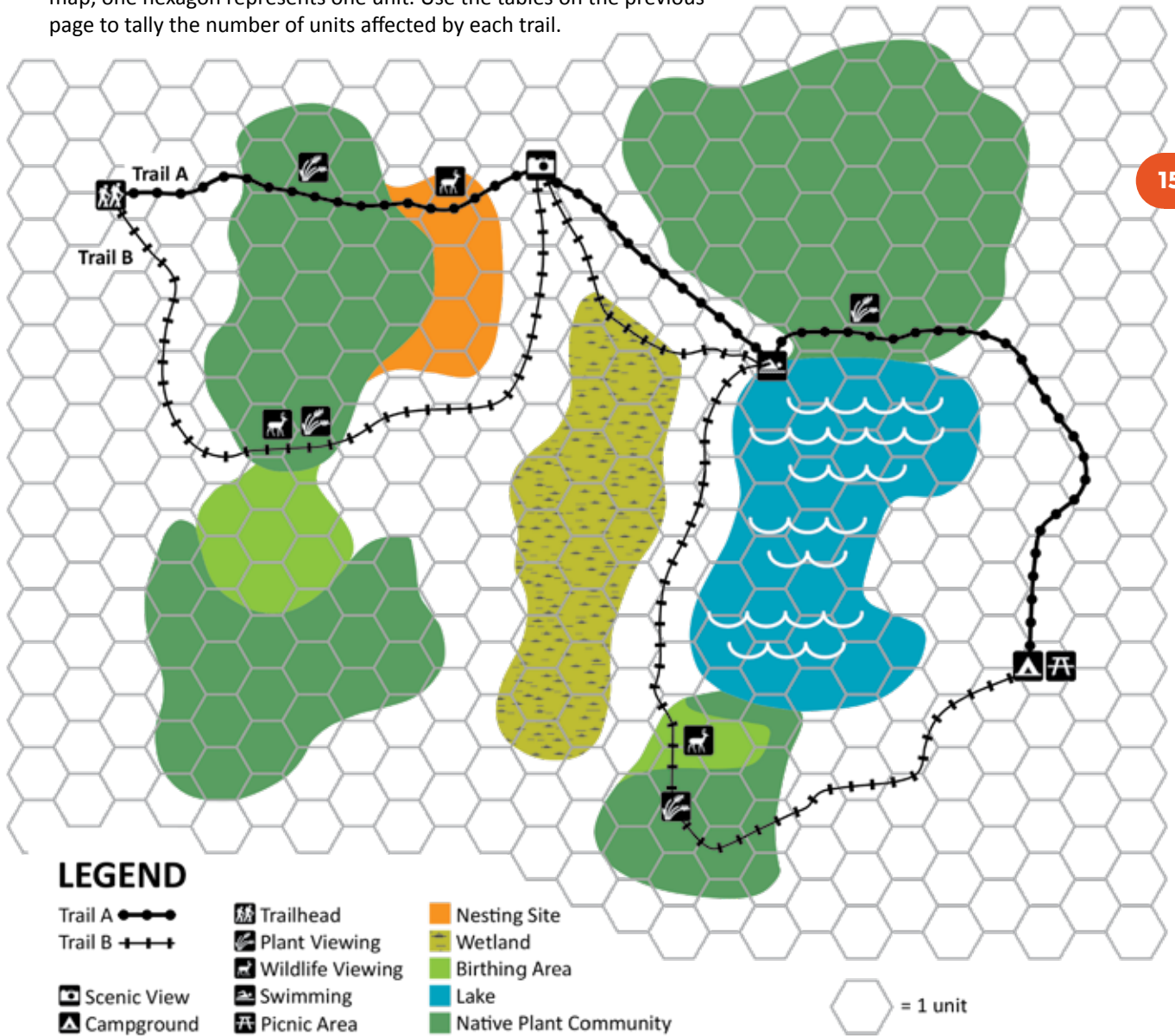
ADVANTAGES		
Recreational Activities	Trail A	Trail B
Plant Viewing		
Wildlife Viewing		
Swimming		
Scenic Viewing		
Picnicking		
Camping		
<b>Total Advantages</b>		

DISADVANTAGES			
Environmental Features	Possible Impact	Trail A	Trail B
Native Plant Community	Habitat fragmented		
Nesting Site	Nesting site fragmented		
Birthing Area	Wildlife disturbed		
Wetland	Wetland damaged		
<b>Total Disadvantages</b>			





**Directions:** The map shows two possible choices, A and B, for locating a new trail. Each trail has advantages and disadvantages. Advantages include the recreational activities the trail will provide. Disadvantages include harm to environmental features. Using the legend, identify the recreational and environmental features of each trail. On the map, one hexagon represents one unit. Use the tables on the previous page to tally the number of units affected by each trail.



1. Name at least two advantages and two disadvantages of Trail A.
2. Name at least two advantages and two disadvantages of Trail B.
3. What other things do you think should be considered before deciding which trail to build?
4. Of the two trails, which one would you choose to build? Explain your choice.

# Take a Break and Make Like a Tree

Do you know the yoga tree pose? Think of the amazing variety of native trees that grow on our public lands, from giant redwoods of California to saw palmetto palms of Florida. Take a break from your public lands adventure. Stand up, stretch out, and imagine you are a tree. If you can, have someone read the following aloud:

16

## Palmetto Pose



- Journey to the Jupiter Inlet Lighthouse Outstanding Natural Area in Florida. Imagine you are a palmetto.
- Place your feet close together to form the trunk. Your toes are roots that spread out underground.
- Reach your arms outward and upward. Stretch out your fingers. Your fingers are leaflets fanning out from your hand. You are a palmetto.
- Now imagine a warm breeze blowing from the Atlantic Ocean. As the breeze grows stronger, your leaves begin to sway.
- Dig in your roots as your leaves sway in the ocean breeze.
- Inhale and exhale. Breathe in the salty sea air.

## Redwood Reach



- Head to the Headwaters Forest Reserve in California. Imagine you are a giant coastal redwood.
- Spread your feet apart, and plant them firmly on the ground. Your legs form a trunk that is 20 feet wide.
- Imagine your toes are roots extending out from the trunk and into the earth.
- Tighten up your legs and torso as you stretch your arms up high above your head. Stand straight and tall. Reach even higher.
- You are now nearly 300 feet tall and have been growing for hundreds of years. You are a coastal redwood.
- Inhale and exhale as you enjoy your treetop view.

## Do you have a favorite tree?

Perhaps it is a tree you see from your window or a favorite tree for sitting under. Can you invent a pose based on your tree? Perhaps you can think of a pose to represent a native wildflower, shrub, or other native plant. **Be creative!**

# Answer Key

## Ecosystem Give and Take, p. 7

1. energy
2. carbon dioxide, moisture
3. oxygen
4. water, nutrients
5. stabilizes
6. nesting site
7. shelter
8. disperses
9. food
10. food
11. nutrients
12. food

## An Invader Threatens Sagebrush, p. 11.

1. 16
2. 4,900,000
3. More cheatgrass habitat corresponds with fewer sage-grouse males per acre.
4. Prevent the spread of cheatgrass, help sagebrush to re-grow in burned areas, etc.

## Build a Trail, p. 14 and 15

For numbers 1 and 2, different people will have different answers. Here are some possible answers:

1. Trail A advantages: plant viewing, wildlife viewing, scenic view, swimming, campground, picnic area  
  
Trail A disadvantages: More nesting site area is fragmented than Trail B. More native plant habitat is fragmented than Trail B.
2. Trail B advantages: plant viewing, scenic view, swimming, campground, picnic area; Trail B provides more opportunity for wildlife viewing.

Trail B disadvantages: Trail B would disturb the birthing area. Trail B would damage the wetland.

Outdoor recreation planners have to think about the benefits and impacts of providing recreational activities. There are many “correct” answers to numbers 3 and 4.

## Characterize the Career, p. 12

### Duties

Studies plants, animals, and their habitats in order to help protect them.

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Tribal liaison

maintenance worker

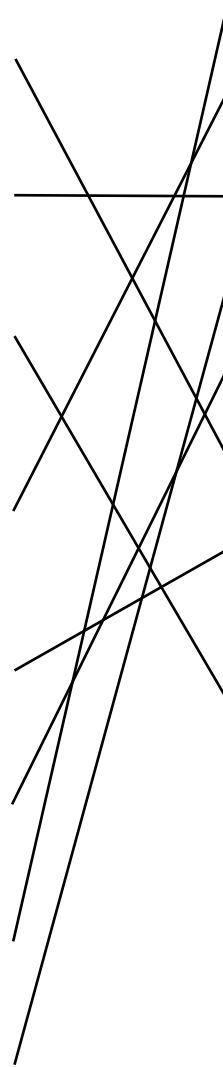
engineer

forester

biologist

fire technician

rangeland management specialist





## For Educators

The following curricular standards are supported by the activities in this book:

Next Generation Science Standards: K-ESS2-2, K-ESS3-1, K-ESS3-3, K-LS1-1, 2-LS4-1, 3-LS3-2, 3-LS4-3, 3-LS4-4, 4-LS1-1, 4-ESS3-1, 5-ESS3-1, MS-LS2-4, MS-LS2-5.

All activities support Common Core State Standards for Reading and Writing.  
Some activities support Math competency.

This publication was produced by the BLM Division of Education, Cultural, and Paleontological Resources.

Additional copies may be obtained by emailing [kids@blm.gov](mailto:kids@blm.gov) or writing to:  
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