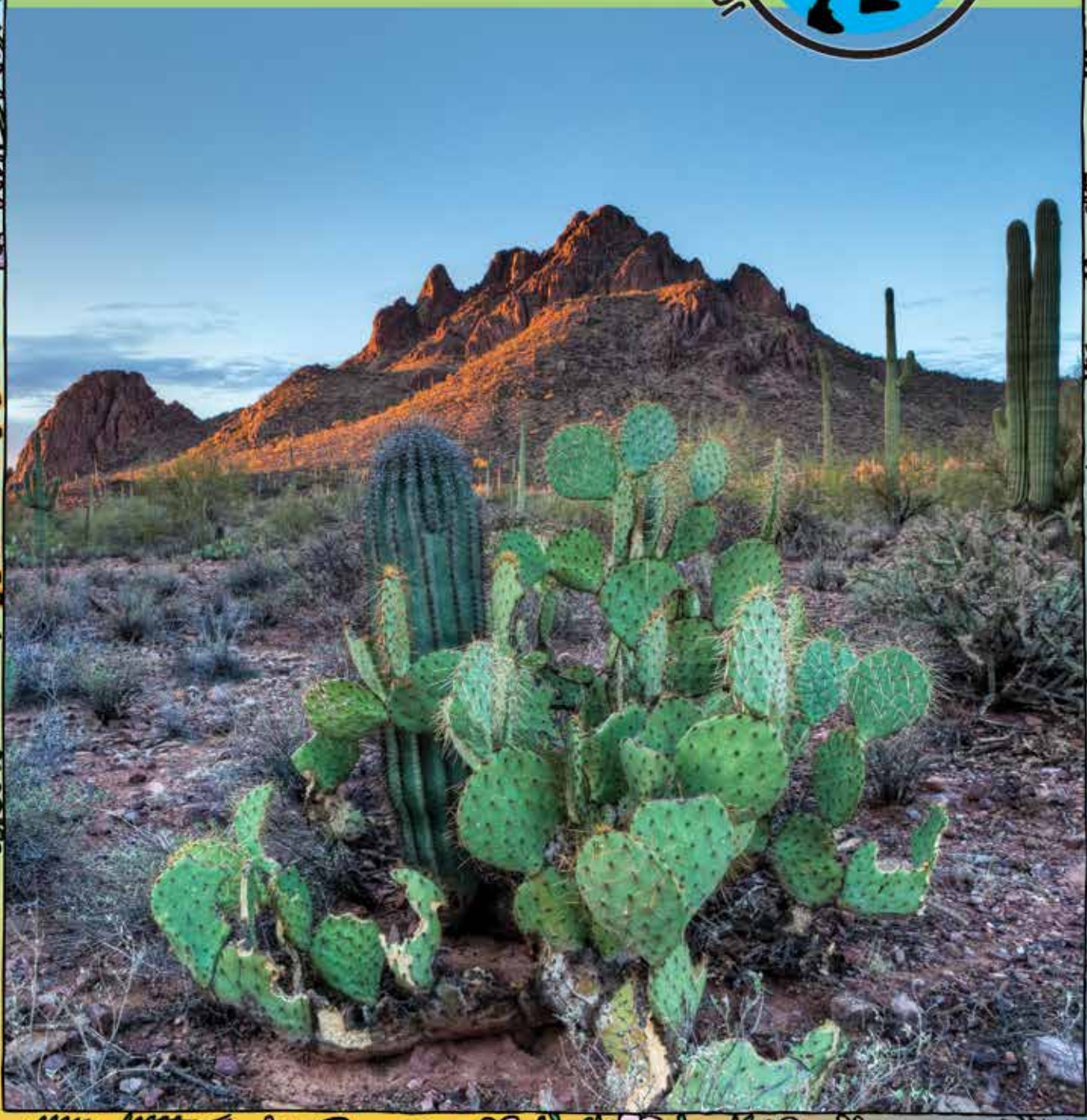
JUNIOR RANGER

Native Plants

JUNIOR RANGER

JOIN THE ADVENTURE



Native Plants

NATIVE PLANTS

Junior Ranger

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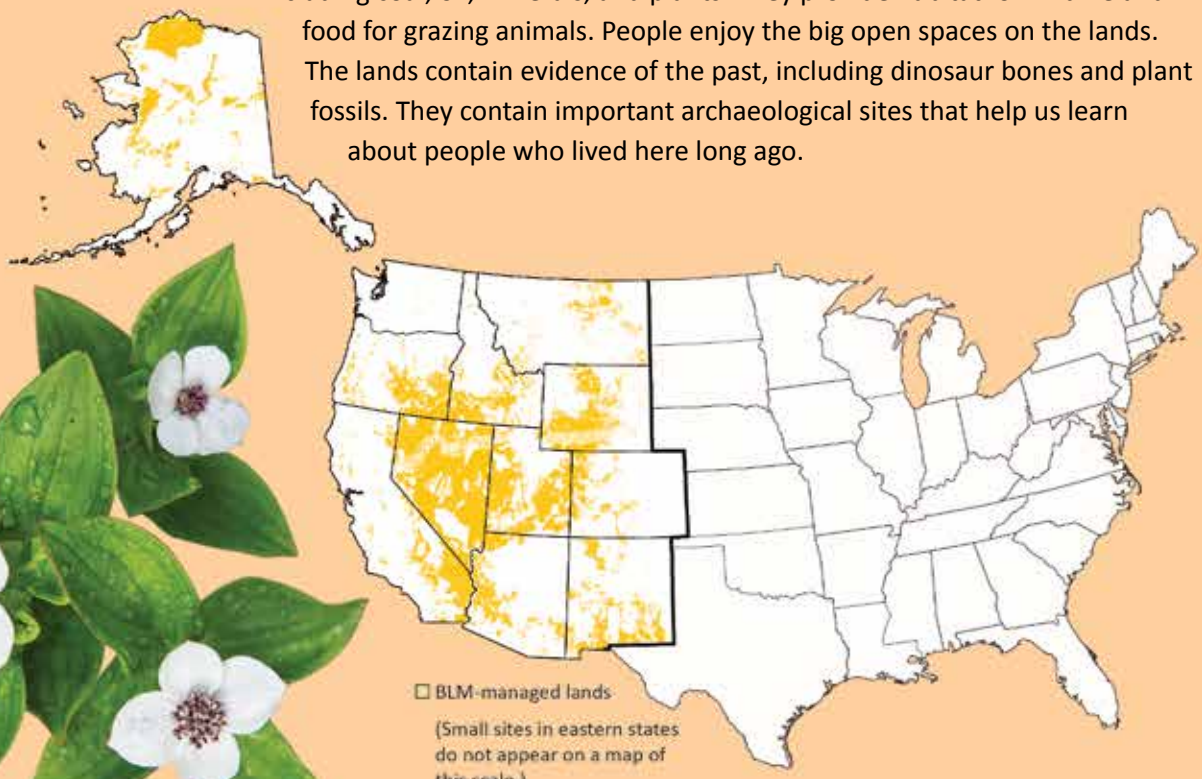
Public Lands Belong To You!

The Bureau of Land Management (BLM) is a federal government agency that takes care of more than 245 million acres of public land. These lands belong to all Americans. Most of the lands are in the Western United States. However, the BLM also cares for a number of sites in the east. BLM public lands are almost equal in area to all the land in the states of Texas and California put together.

The BLM conserves and manages public lands for many uses. The lands supply natural resources including coal, oil, minerals, and plants. They provide habitat for wildlife and food for grazing animals. People enjoy the big open spaces on the lands. The lands contain evidence of the past, including dinosaur bones and plant fossils. They contain important archaeological sites that help us learn about people who lived here long ago.



Junior Rangers

The Junior Ranger program introduces young adventurers to the lands and resources managed by the Bureau of Land Management (BLM). We hope you enjoy the activities in this book. When you are finished, cut out the Junior Ranger certificate on page 25. Then, say the Junior Ranger pledge and sign the certificate. We invite you to join the adventure!

Did You Know?

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.

WORDS TO KNOW

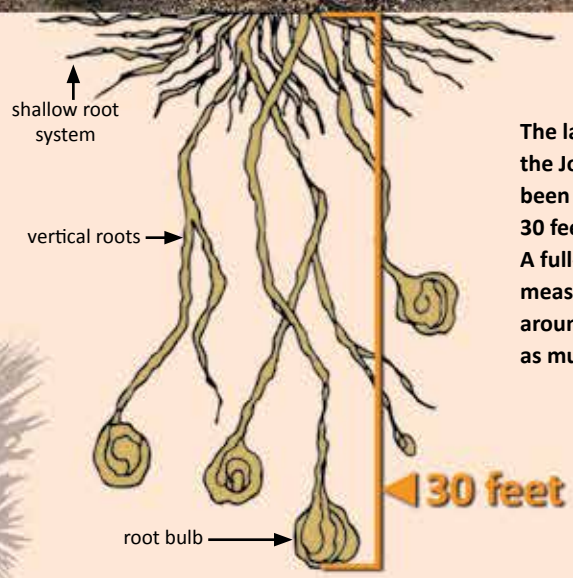
- ecosystem: community of interacting living things
- evolve: change over time
- adapt: adjust to the environment
- climate: typical weather conditions in a certain place over many years
- niche: role and place for a living thing in an ecosystem
- erosion: process of wearing away by water or wind

Fun Facts

Deep and Wide Roots

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 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.

Fun Facts (continued)

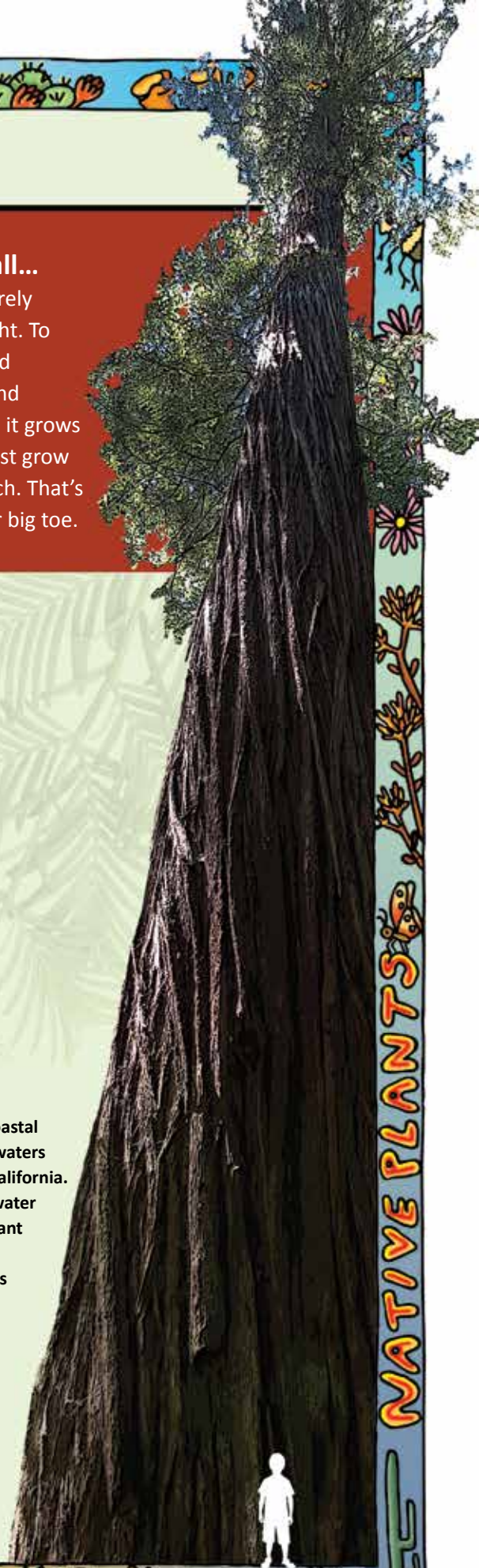
Native Plants: Small...

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. That's not even as high as your big toe.

...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.

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.



Benefits of Native Plants

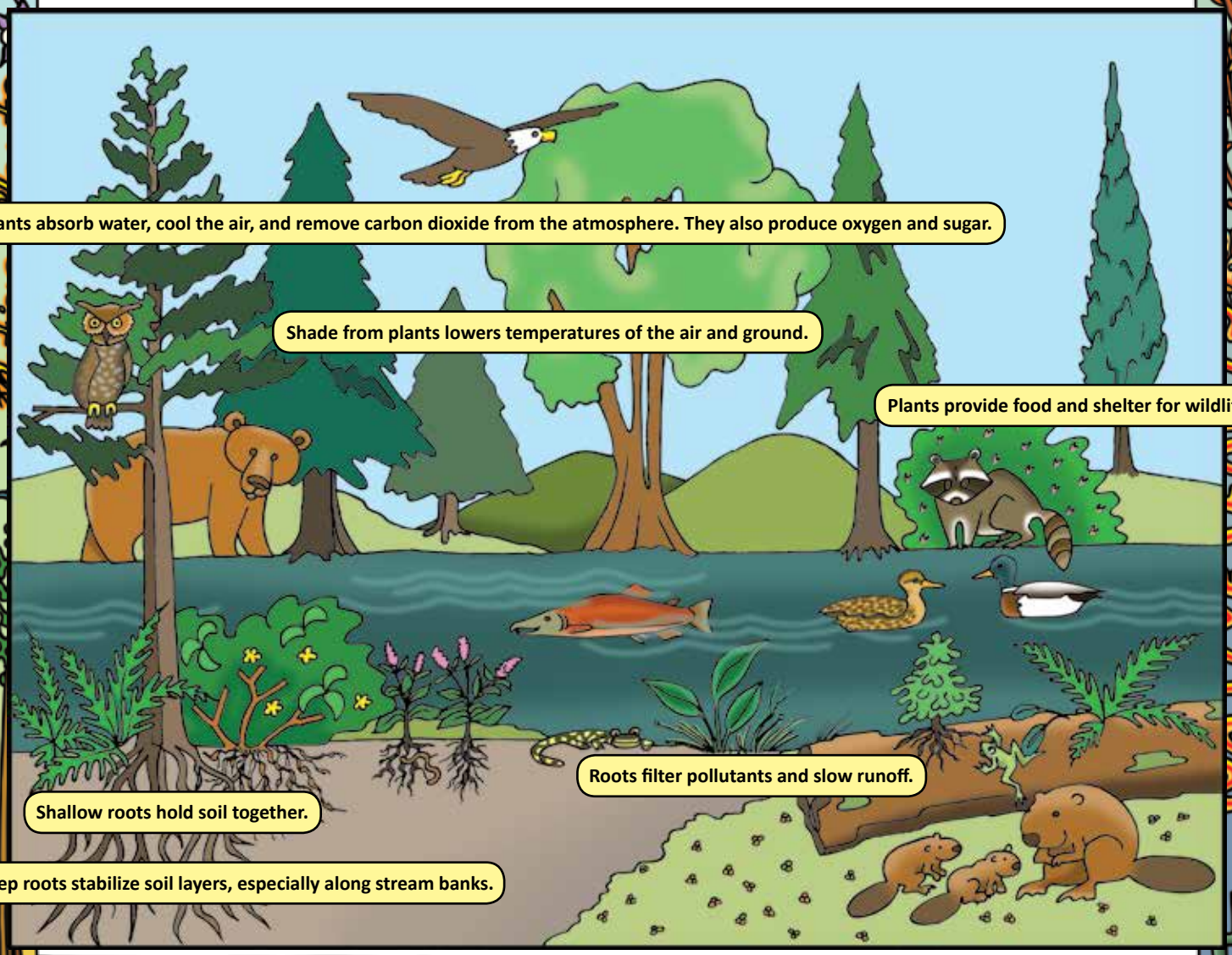
WORDS TO KNOW

- benefit: (noun) something that is useful or helpful
- interdependence: living things depending on one another for survival

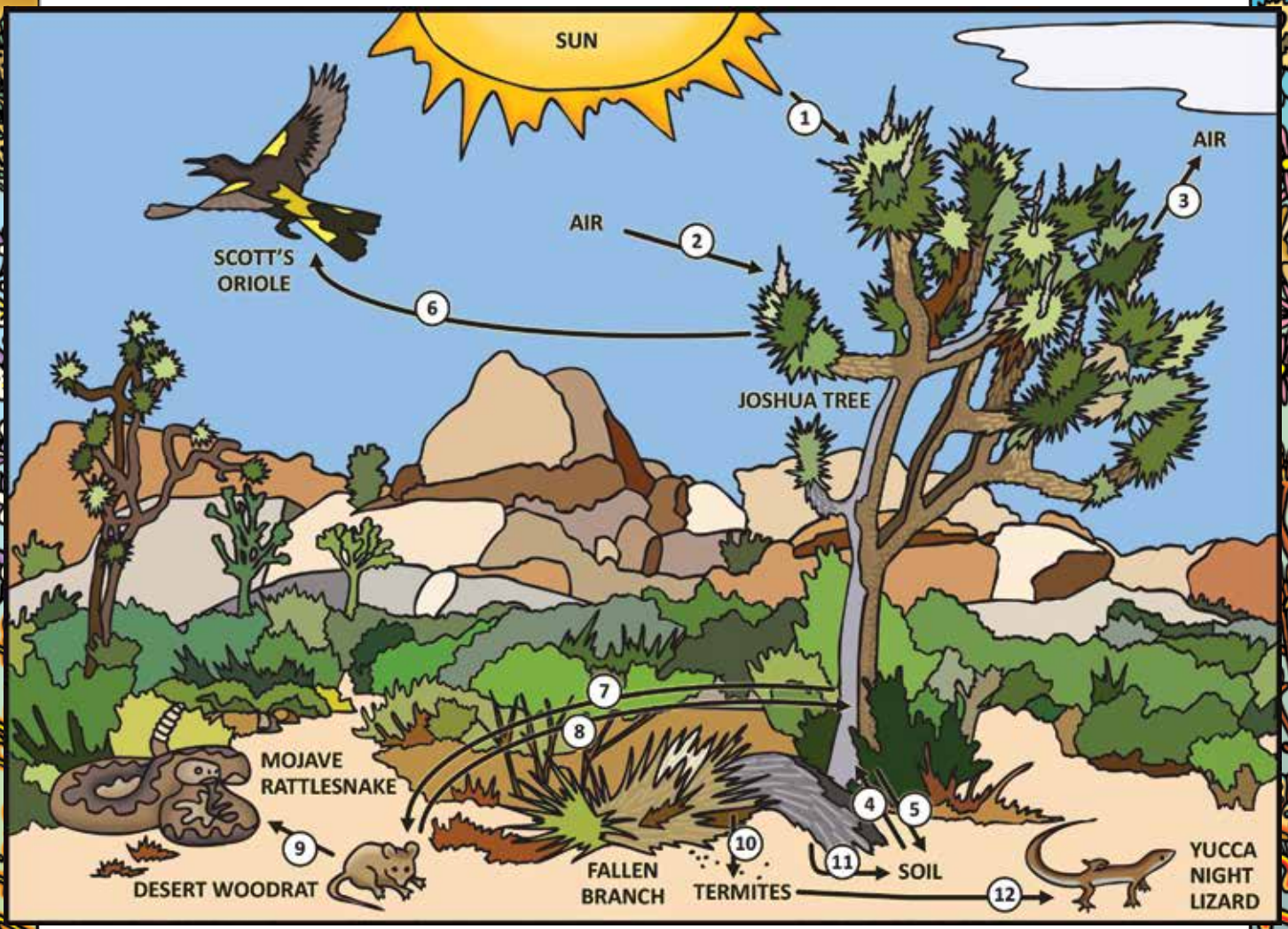
Native plants add beauty to our landscapes. They also benefit the lands in ways we cannot see. They produce oxygen and sugars, the primary fuels of life. The picture below shows many other ways native plants benefit the environment.

Over thousands of years, native plants evolved with native animals in an ecosytem, adapting to one another, to the soil, and to the climate. The result is a network of interactions among all parts of the ecosystem. For an ecosystem to be healthy, all parts must be in balance.

In exchange for the **benefits** that the plants give to the ecosystem, the ecosystem gives back to the plants—sunlight, water, carbon dioxide, and nutrients. The ecosystem depends on the plants. The plants depend on the ecosystem. This **interdependence** creates a balanced ecosystem.



Activity: Ecosystem Give and Take



Directions: In this Mojave Desert ecosystem, arrows represent interactions between parts of the ecosystem. For example, arrow #4, which points to the Joshua tree, represents water or nutrients passing from the soil to the plant. Read the below information, and complete sentences on the next page using words from the word bank. Some words will be used more than once.

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. Even a fallen dead branch provides food and **cover** for insects and lizards. 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 do their part. 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.

WORDS TO KNOW

- cover: shelter from weather and predators
- disperse: to spread or distribute over an area
- exchange: the giving and taking of one thing for another; a trade

Activity: Ecosystem Give and Take

WORD BANK:	food	shelter	moisture	stabilizes
	nutrients	oxygen	energy	carbon dioxide
	nesting site	disperses	water	

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 other interactions can you think of that might take place in this ecosystem?

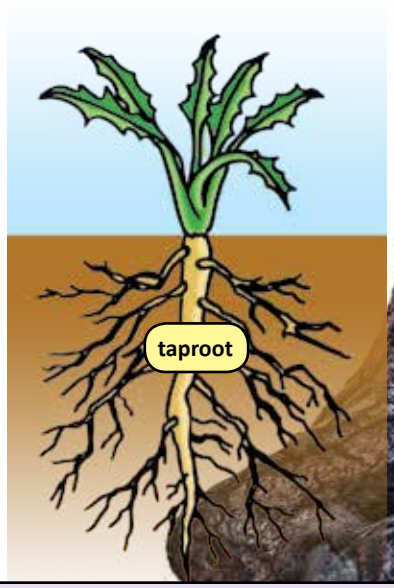
Photo by Alan Cressler (USDA Forest Service)

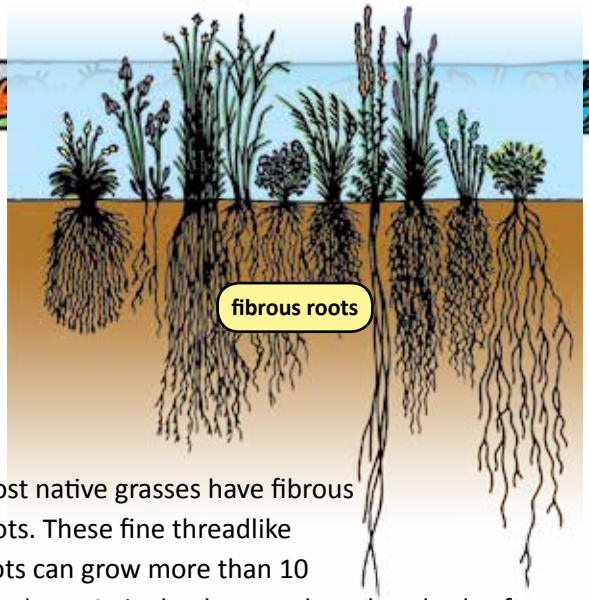
The relationship between the yucca moth and the Joshua tree is an example of interdependence. The moth is the tree's only pollinator. And the tree is the only place where the moth can lay her eggs. The two cannot survive without each other.

Native Plants
Underground

With native plants, what's happening underground is as important as what you see above the ground. Nearly half of a plant is its roots. These roots benefit both the plant and the ecosystem.

Many plants have one main root called a taproot, a thick root that grows straight down. It binds layers of soil together. Smaller secondary roots grow out from the taproot and help anchor the plant in the ground. Even smaller root hairs grow out from the larger roots so more water can be absorbed.

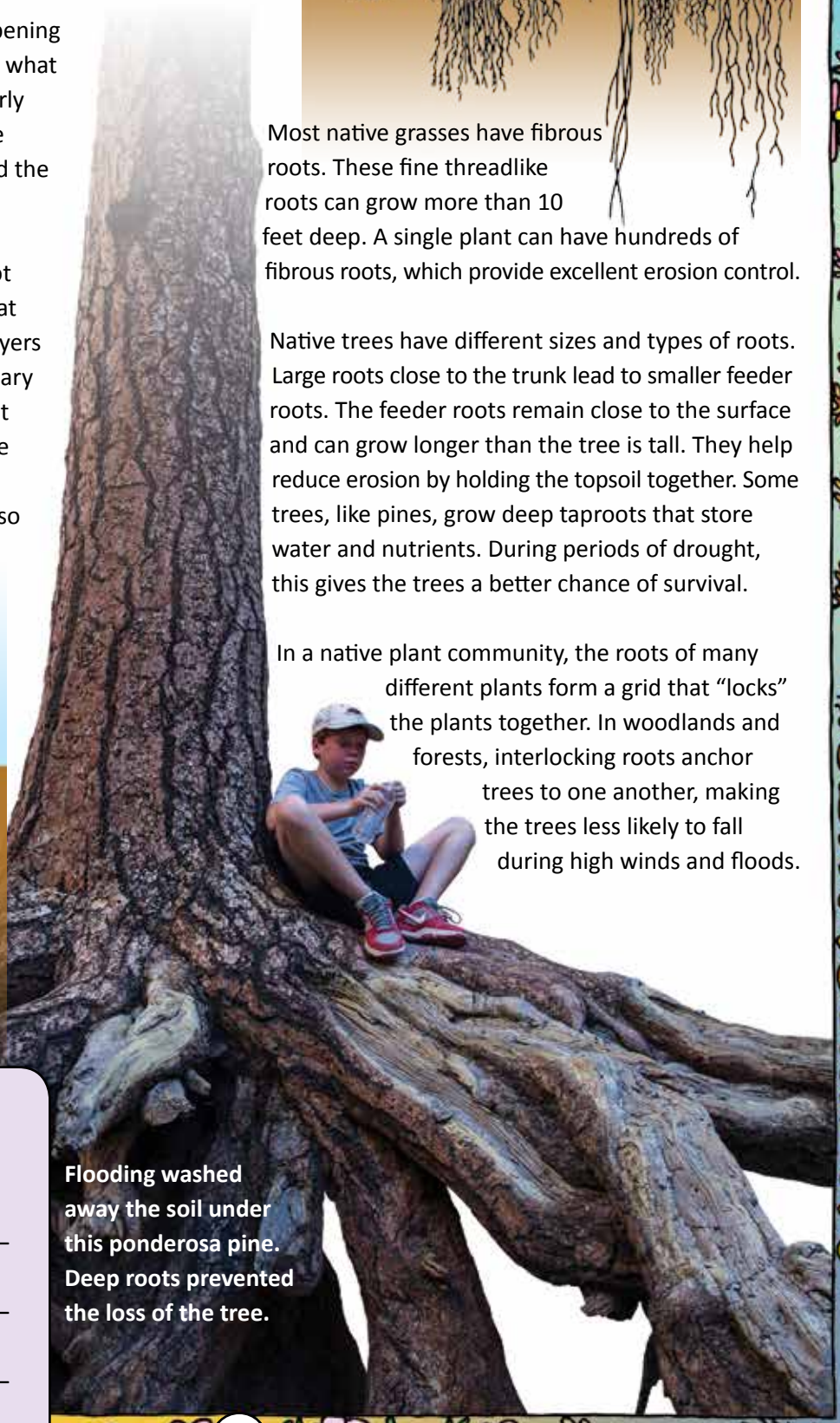




Most native grasses have fibrous roots. These fine threadlike roots can grow more than 10 feet deep. A single plant can have hundreds of fibrous roots, which provide excellent erosion control.

Native trees have different sizes and types of roots. Large roots close to the trunk lead to smaller feeder roots. The feeder roots remain close to the surface and can grow longer than the tree is tall. They help reduce erosion by holding the topsoil together. Some trees, like pines, grow deep taproots that store water and nutrients. During periods of drought, this gives the trees a better chance of survival.

In a native plant community, the roots of many different plants form a grid that "locks" the plants together. In woodlands and forests, interlocking roots anchor trees to one another, making the trees less likely to fall during high winds and floods.



Flooding washed away the soil under this ponderosa pine. Deep roots prevented the loss of the tree.

Think About It

Name some of the ways roots of native plants benefit the ecosystem:

_____

_____

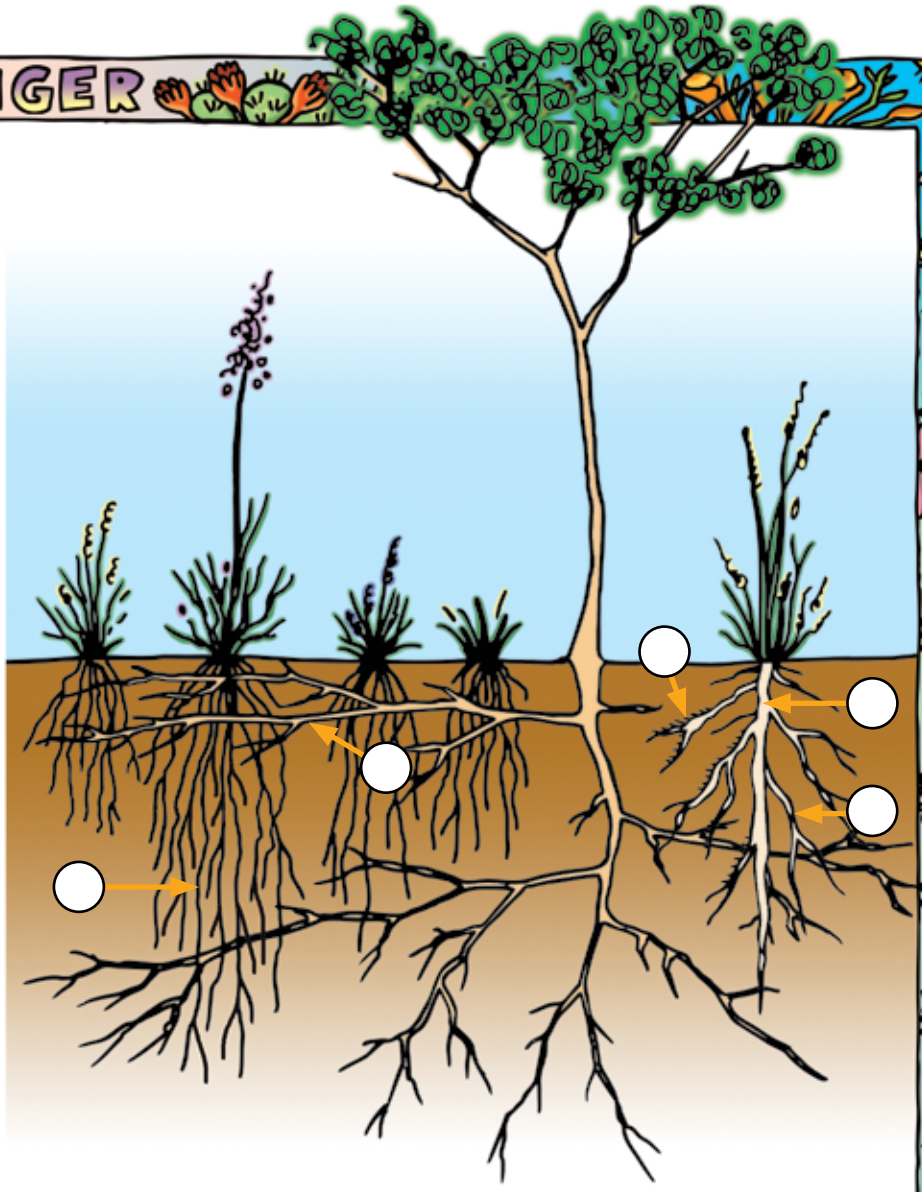
_____

_____

Activity:
Untangle the Roots

Roots of native plants tangle up and form an interlocking grid that stabilizes soil and reduces erosion. This picture represents root systems of some native plants.

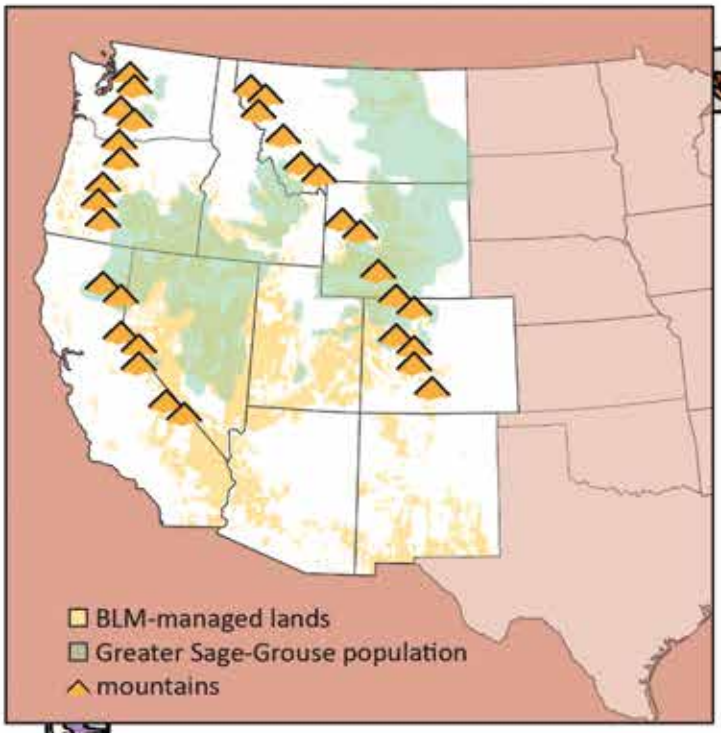
Directions: Based on the narrative from the previous page, untangle the words below to find the names of each root and root part shown in the picture. Then match the words to the picture by writing the numbers in the circles. Finally, arrange the letters from the shaded boxes to find the mystery word.



1. steedroofer
2. oatport
3. oboistfurors
4. ratiorhos
5. nosydecorators

Mystery ***Word***

Roots of native plants are great at controlling this:



A Sea of 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.

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.

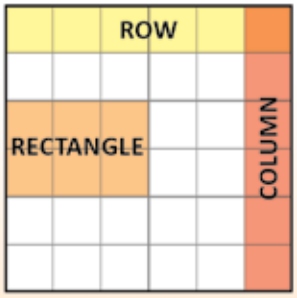
For a variety of wildlife—such as pygmy rabbits, pronghorns, sagebrush lizards, and golden eagles—sagebrush steppe is home sweet habitat. Some animals, such as the Greater Sage-Grouse, depend entirely on sagebrush. During the winter, this ground-dwelling bird eats sagebrush leaves and buds. In the spring, 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.

WORDS TO KNOW

- arid: extremely dry; receiving little rainfall
- steppe: dry, usually flat area, generally covered with grasses and shrubs
- dominant: most common; main

Native Plant Communities

The Columbia River Basin covers parts of seven Western States. It includes large areas of sagebrush steppe. Plants such as rabbitbrush, winterfat, Indian ricegrass, and wildrye grow among the different kinds of sagebrush. In addition, wildflowers such as globemallow, arrowleaf balsamroot, sego lilies, and phlox add to the diversity of plant life. This diversity of native plants is the foundation for a balanced ecosystem.



KEY

Picture	Plant/Letter
	S Sagebrush
	P Phlox
	G Globemallow
	R Rabbitbrush
	W Winterfat
	A Arrowleaf Balsamroot

Activity:
Restore the Balance

This logic puzzle focuses on six native plants found in sagebrush communities: sagebrush, phlox, globemallow, rabbitbrush, winterfat, and arrowleaf balsamroot. Complete the puzzle by finding the place for each of these native plants.

Directions: Each row, column, and rectangle must have exactly one of each plant shown in the key. To solve the puzzle, identify which plants are missing and exactly where they must go. Complete the puzzle by writing the letters provided in the key, or use the cutouts at the bottom of page 27.

				S	P
			A	G	W
	G	W			
P	R				
G		A	S	W	
	W	R	G		A

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.

WORDS TO KNOW

- climate change: a significant change in the climate over the entire planet
- invasive plants: nonnative plants that take over a community of native plants
- impact: (verb) have a strong effect on something

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.

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. As native plants die from diseases and are eaten by animals, nonnative plants move in to replace them. In time, they can crowd out the native plants. When this happens, nonnative plants become **invasive plants**.

As invasive plants take over an area, native plants disappear, and animals lose important habitat. Compared to the native plants, root systems of invasives are less complex. This can lead to more erosion. Thousands of acres of our public lands are being harmed, or **impacted**, by invasive plants.

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

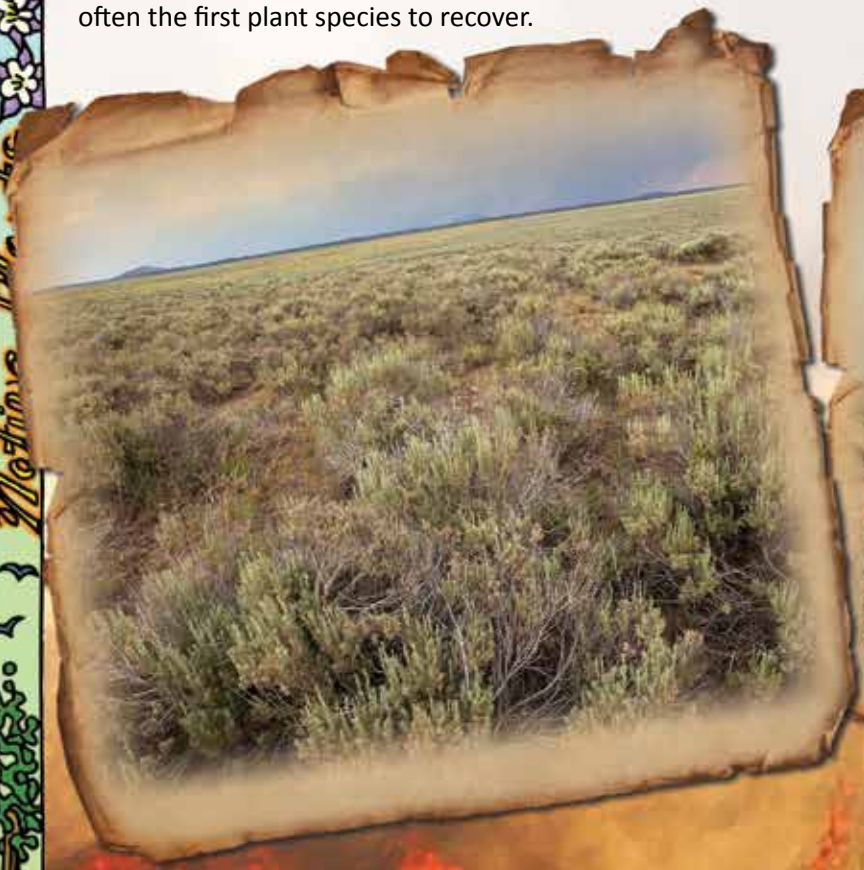
An Invader Threatens Sagebrush

A century ago, sagebrush covered more than 15 million acres of our western grasslands. Now, nearly half of the sagebrush steppe has disappeared. One reason for the sagebrush's decline is an invasive plant known as cheatgrass.

Ecologists believe the first cheatgrass seeds arrived in North America more than 100 years ago. These nonnative seeds probably came on ships from Europe and Asia. Cheatgrass seeds quickly grew where native plants had been damaged or destroyed. To make things worse, cheatgrass was excellent fuel for fire. After a fire, cheatgrass was often the first plant species to recover.

With each cycle of wildfire, cheatgrass continued to spread. Today, cheatgrass continues to be a big problem. This invasive plant has overtaken millions of acres of sagebrush steppe.

The loss of sagebrush habitat has harmed the population of the Greater Sage-Grouse. A century ago, nearly 16 million Greater Sage-Grouse called the sagebrush steppe home. Since the introduction of cheatgrass, the population has shrunk to less than a half-million. To help this bird recover, the BLM and other land managing organizations are working together to conserve and restore sagebrush habitat.



Activity: Search for the Native Plants

You have probably heard the expression "You can't judge a book by its cover." It is the same with plants. You cannot judge the value of a plant by just looking at it. Native plants with beautiful blossoms can be beneficial to their ecosystems. Nonnative plants, no matter how pretty, can be harmful.

Directions: Names of wildflowers are hiding in this word search puzzle. Some of the plants are native, but others are invasive. Circle the names of the native plants. Draw a line through the invasive plants.

NATIVE PLANTS

Kincaid's lupine
Siskiyou mariposa
Laramie columbine
desert yellowhead
purple amole
Williams combleaf
blowout beardtongue
dwarf lousewort
pink funnel lily
July gold
Hall's daisy

INVASIVE PLANTS

leafy spurge
garlic mustard
purple loosestrife
Dalmatian toadflax
yellow star-thistle
Russian knapweed

E	X	B	E	G	R	U	P	S	❀	Y	F	A	E	L	E	W	A	R	E	B	E
A	U	A	U	T	Y	T	C	A	N	H	I	D	E	A	B	❀	E	A	S	Y	T
V	❀	G	L	X	D	E	S	E	R	T	❀	Y	E	L	L	O	W	H	E	A	D
B	L	M	N	F	S	❀	D	R	H	G	M	W	L	T	B	Y	E	L	❀	R	W
V	T	Z	P	O	D	L	O	L	T	H	X	N	S	Q	E	❀	L	V	A	T	A
N	E	B	O	X	T	A	G	H	O	W	Y	❀	T	E	H	O	P	T	V	M	R
A	F	Y	W	L	❀	D	O	R	S	G	H	F	R	A	W	U	S	H	X	Y	F
T	M	L	J	K	Q	I	R	T	X	T	❀	P	K	❀	R	U	K	E	T	A	❀
I	C	I	Z	Q	L	E	Z	A	❀	K	V	Y	S	P	M	W	V	❀	S	T	L
V	O	L	T	E	S	S	R	H	E	N	B	T	L	❀	X	E	L	O	K	I	O
E	A	❀	V	H	X	❀	C	T	R	B	A	E	C	U	V	N	P	S	P	N	U
❀	F	L	G	F	I	T	K	L	B	R	❀	I	A	R	J	I	K	V	H	V	S
P	I	E	W	D	A	R	S	❀	T	L	L	T	T	P	R	B	A	R	C	A	E
L	A	N	Q	C	U	E	H	H	O	R	O	R	U	A	U	M	O	K	❀	S	W
A	P	N	S	❀	R	S	I	O	A	K	Y	R	M	O	M	U	K	J	N	I	O
N	❀	U	G	X	I	S	S	G	L	S	P	❀	K	P	W	L	S	T	Q	V	R
T	H	F	E	R	T	E	K	M	I	L	U	L	M	W	X	O	A	K	P	E	T
S	E	❀	J	L	S	S	R	A	E	O	O	M	U	K	P	C	L	D	H	❀	P
N	T	K	E	T	Q	K	D	❀	Y	K	A	U	L	I	D	❀	P	B	Q	P	X
K	V	N	R	S	K	❀	A	I	L	R	M	L	I	M	A	E	R	T	V	L	A
I	N	I	A	N	S	M	K	U	E	L	L	N	❀	Z	L	I	X	O	X	A	B
T	F	P	❀	L	O	S	G	B	T	M	F	R	I	V	R	M	N	❀	Z	N	K
E	W	I	L	L	I	A	M	S	❀	C	O	M	B	L	E	A	F	L	S	T	H
R	N	A	E	S	❀	M	W	T	A	L	R	P	Q	E	R	R	E	S	❀	S	B
R	H	B	N	F	E	D	E	E	W	P	A	N	K	❀	N	A	I	S	S	U	R
A	❀	T	F	Z	L	A	K	I	N	C	A	I	D	S	❀	L	U	P	I	N	E

Starting from the top left, place the unused letters in order until you complete the hidden message:

Hidden Message:

_____! _____ ____ _____ _ _____!

WORDS TO KNOW

- conserve: keep in existing state; protect
- restore: bring something back to the way it used to be

BLM: Giving Native Plants a Helping Hand

The BLM is entrusted with the care of America's public lands. BLM employees work to **conserve** native plants, wildlife, and other resources found on these lands. They know that the health of the land depends on healthy native plant communities. They develop plans to protect plants from threats such as fire, pollution, and invasive plants. In places where damage has occurred, BLM employees work to find ways to return, or **restore,** native plants.

Another job of the BLM is to provide opportunities for people like you to enjoy the outdoors. Outdoor recreation planners work with other BLM experts to make sure these activities do not harm native plant communities and animal habitat.

Activity: Building a Trail

Imagine that you are an outdoor recreation planner for the BLM. You are planning a new hiking trail 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 **fawning ground**. The trail will guide hikers from a trailhead to a picnic area and campground.

Building a trail could impact important features of the environment, including the nesting site and fawning ground. 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. (In addition to hiking, these can include 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.

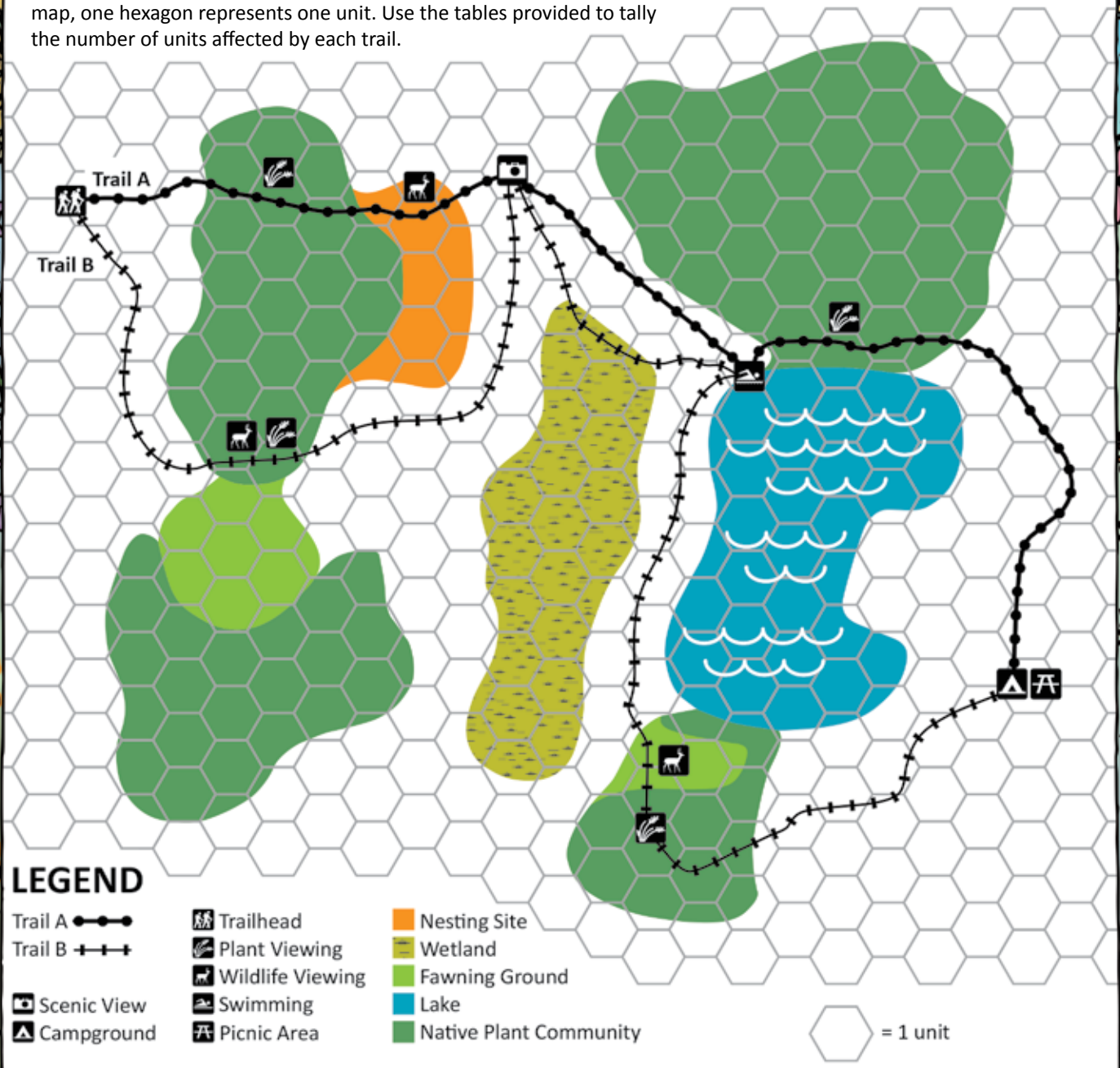
Advantages		
Recreational Activities	**Trail A**	**Trail B**
Plant Viewing		
Wildlife Viewing		
Swimming		
Scenic Viewing		
Picnicking		
Camping		
Total Advantages		

Disadvantages			
Environmental Features	**Possible Impact**	**Trail A**	**Trail B**
Native Plant Community	Habitat fragmented		
Nesting Site	Nesting site fragmented		
Fawning Ground	Wildlife disturbed		
Wetland	Wetland damaged		
Total Disadvantages			

WORDS TO KNOW

- fawning ground: area where hooved animals such as deer and pronghorn give birth to and raise their young
- fragment: (verb) to divide an area into smaller areas that are not connected

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 provided 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.

Activity: 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: the giant coastal redwoods of California, the crooked Joshua tree found in desert regions, the 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:

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.

Joshua Tree Stretch

- Next, travel to the Red Rock Canyon National Conservation Area in Nevada. Imagine you are a Joshua tree.
- Place your feet together to form the trunk. Your toes become shallow roots that branch out on all sides. Imagine another set of roots seeking water deep in the ground.
- Tighten your trunk and stretch out your arms. Bend your elbows to form crooked branches. Your fingers are long swordlike leaves. The ends of your fingers are sharp points. You are a Joshua tree.
- Imagine the rare desert rain that begins to fall. Your leaves capture the water which slides down your trunk and into your roots.
- Imagine that your head is a large cluster of blossoms that have a sweet fragrance.
- Inhale and exhale as you filter the hot desert 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.
- Your needles soak in water from the coastal fog. Your roots drink in water from the ground. You drink 150 gallons of water in a day.
- 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? Use the space to the right to write about your tree or to draw a picture of the tree or your pose, or both. Perhaps you can think of a pose to represent a native wildflower, shrub, or other native plant. **Be creative!**

Being a Good Steward

WORDS TO KNOW
- steward: someone who protects or is responsible for land or property
- impact: (noun) a strong effect

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

Stewardship means the careful and responsible treatment of something entrusted to our care. Each of us can do our part to care for the lands and their resources. By being good stewards, we limit the effect or **impact** our activities might have on the environment. In this way, we help ensure future generations will be able to use and enjoy public lands.

One way you can help is by protecting native plants. Here are some things you can do when you head out to explore the outdoors:

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*

Kids and BLM Team Up to Help Native Plants

Students at Toro Park Elementary School in Salinas, California, have learned firsthand about the value of stewardship. They partnered with the BLM to restore native plants at the Fort Ord National Monument. This former military base has more than 14,000 acres of beautiful scenery and is home to more than 35 rare plants and animals—and it's right next door to the school.

Led by BLM Park Ranger Tammy Jakl, Toro Park students participated in a project called "Return of the Natives." First, they collected seeds from coyotebrush plants growing at Fort Ord. Next, they planted the seeds in small pots of soil and sent them to a greenhouse at California State University at Monterey Bay. Once the seedlings were large enough, they were returned to the students for planting back at Fort Ord. Students completed the restoration cycle by planting the seedlings in damaged areas.

Since the project began, students have restored thousands of native plants to Fort Ord. Habitat has been restored for owls, bats, salamanders, butterflies, and other wildlife. Also, erosion has decreased along Toro Creek. These Toro Park stewards know that their hard work will benefit their community far into the future. In the meantime, the students can enjoy hiking, learning, and just having fun on their public lands.

In the Spotlight: BLM Botanist Holly Beck

Bruneau Field Office, Boise, Idaho

Holly's Road to the BLM

A budding passion for plants . . .

Holly grew up amid Pennsylvania forests and farmlands, miles from the nearest town. As a kid, she spent time climbing rocks, making "forts" from wild grapevines, and just having fun in nature.

Halfway through her college education, Holly took a botany class, and she was soon hooked on native plants. After graduation, she had jobs studying owls, small mammals, songbirds, and vegetation. When Holly returned to college for a graduate degree, she studied relationships between plants and insects.

The BLM beckons Holly west . . .

Holly became interested in working for the BLM long before she applied for her present job. The rugged, arid landscapes and diverse plant communities appealed to her love of nature and sense of adventure. She welcomed the challenge of balancing conservation with other activities on public lands.

In her own words . . .

"As a BLM botanist, I study and protect native plants on 1.5 million acres of Idaho public lands. My main activities are **inventory** and **monitoring**, but I do my 'homework' first: I study maps and other references to locate places where rare species might live. Then I hike the land to look around! Once I find the plants, I count and describe them and take note of the surrounding environment. That is the foundation for monitoring: I can return later to record how the plants have done since my previous visit. Have they been reproducing well? Are invasive plants a threat?

The best parts of my job? Discovering new places and making fresh observations every time I head out to the field!"

Follow in Holly's Footsteps

Education is key . . .

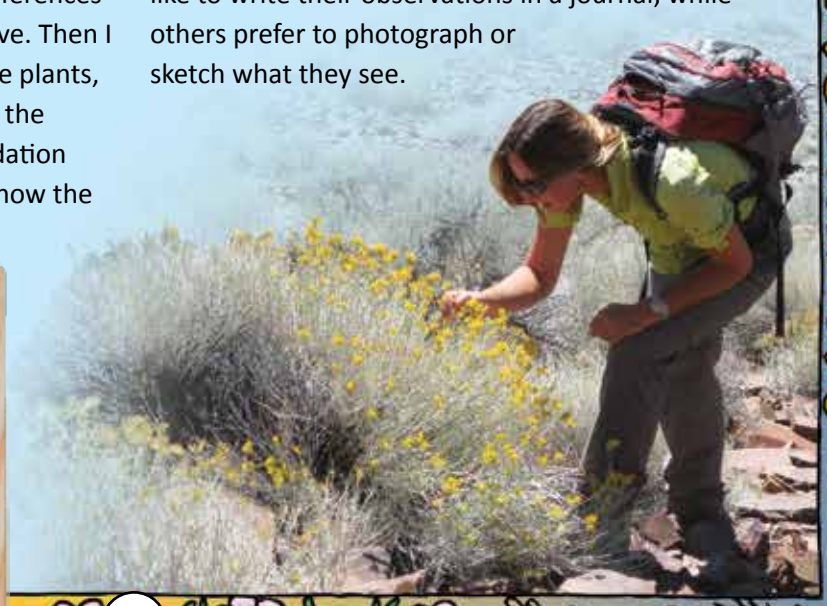
Plant professionals work in a wide variety of specialties with different educational requirements. Check out the next page for information on BLM careers.

Outdoor skills are important . . .

Holly believes that keen curiosity and sharp-eyed observation are important. Another helpful skill is using plant identification tools. Reading a map and using a compass are important skills for navigating through remote lands. Global Positioning Systems (GPSs) don't always work! Strong writing skills are a must, too.

But first . . . just explore your world!

According to Holly, the first step is the most fun. She encourages kids to get outside—every chance they get—to explore, observe, and record. Some people like to write their observations in a journal, while others prefer to photograph or sketch what they see.



WORDS TO KNOW

- inventory: make a list of
- monitor: check up on regularly

BLM
Career Profiles

It takes many different, highly skilled professionals to manage the nation's lands and resources. Are you interested in native plants and habitat? Do you like being outdoors and experiencing new landscapes? Check out these important and exciting careers:

Forester

A forester is an expert in managing forests to keep them healthy. BLM foresters manage millions of acres of forests in 13 western states. In Alaska, BLM foresters take care of nearly 30 million acres. They help protect the forests from wildfire, insects, plant diseases, floods, and erosion. They know that forests provide important natural resources such as timber and habitat for animals. BLM foresters work to make sure our forests will remain healthy far into the future. BLM foresters have a college degree in forestry or a related science.

Botanist

A botanist is a scientist who specializes in plants. Most BLM botanists work to conserve native plants. They work to make sure native plant communities remain healthy. In areas where native plants are in trouble, they work to restore balance in the ecosystem. BLM botanists have a college degree in botany or basic plant science.

Rangeland Management Specialist

BLM rangeland management specialists take care of the plants on public rangeland. Many of these plants are food for the animals that live off the land: livestock such as cows and sheep, wild horses and burros, and wildlife. Rangeland management specialists are also concerned with plants that protect the soil and watersheds. A range conservationist works with ranchers, biologists, environmentalists, and recreationists to create plans to keep range and other native plants healthy. To become a rangeland management specialist, you will need a college degree in range management.

Conservation Scientist

Conservation scientists manage the overall quality of forests, parks, rangelands, wetlands, and other natural resources. They ensure that native plant communities and wildlife species that use them as habitat are protected and conserved. BLM conservation scientists have a degree in forestry, biology, ecology, or a related field.

Fire Technician

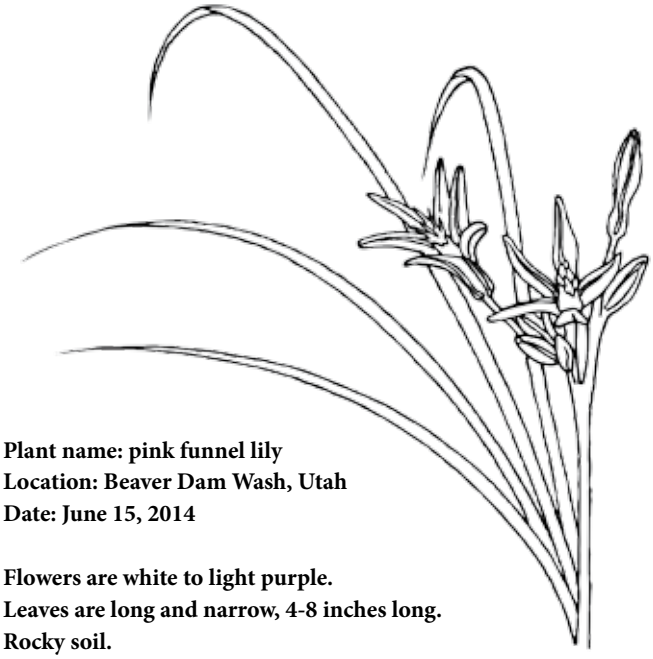
BLM fire technicians prevent, control, and extinguish fires. One way they do this is by reducing grasses, dry shrubs, dead branches, and other "fire fuels." To predict how a fire will behave, they collect information on weather, plants and other fuels, and the shape of the land's surface. Fire technicians use this information to develop plans for fighting wildfire and to reduce damage caused by fire and smoke. The minimum requirements to become a fire technician are a high school diploma and wildland firefighting experience. You can also qualify by taking college courses such as range conservation, forestry, mathematics, engineering, biology, and other sciences.

Activity: Explore Native Plants through Journaling

A journal is a record of what you see or observe. BLM employees and volunteers keep journals of native plants on our public lands. These journals can include drawings or photographs and notes, including the location and time of year.

Use the space provided to write about plants you observe in your yard, your community, or on public lands. Include a sketch and information about the color and size of the plant. Include other details that you think are important. You can use the ruler found at the end of this booklet to take measurements of small plants. It is also okay to estimate the size. Remember to leave the plants as you find them.

Sample journal entry:



Plant name: pink funnel lily
Location: Beaver Dam Wash, Utah
Date: June 15, 2014

Flowers are white to light purple.
Leaves are long and narrow, 4-8 inches long.
Rocky soil.

Plant 1.

Plant 2.

Plant 3.

Bureau of Land Management

Junior Ranger

As a Bureau of Land Management Junior Ranger, I promise to:

- Do all I can to help preserve and protect the natural and cultural resources on our public lands.
- Be aware of how my actions can affect other living things and the evidence of our past.
- Keep learning about the importance of nature and our heritage.
- Share what I have learned with others!

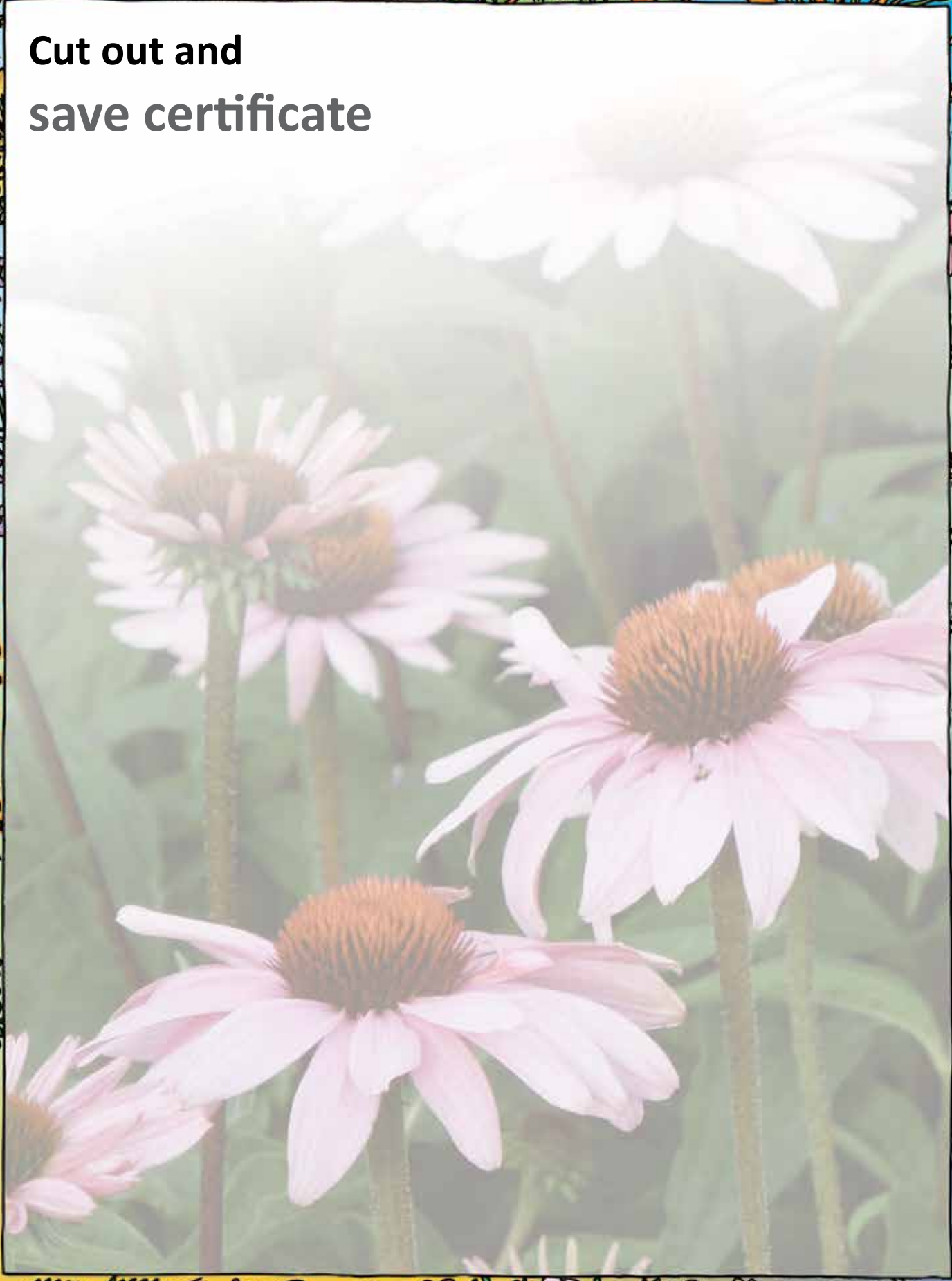
_____ _____

Date Junior Ranger Signature

JUNIOR RANGER

Cut out and

save certificate



Native Plants

NATIVE PLANTS

Junior Ranger

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

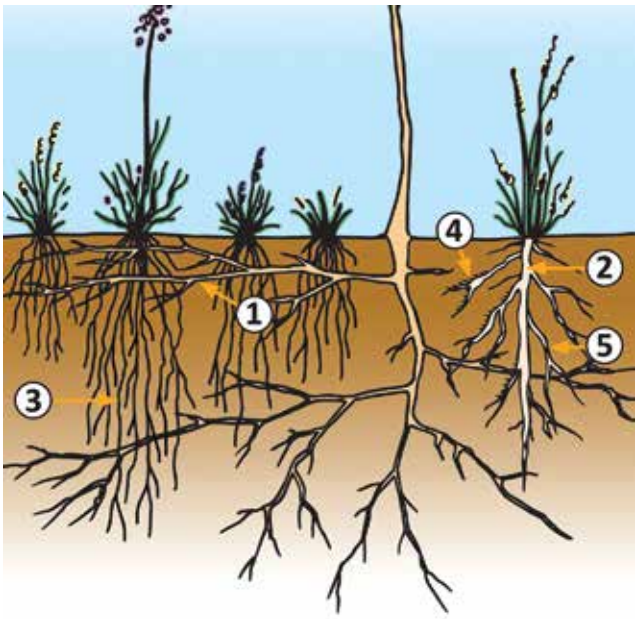
Native Plants Underground, p. 8

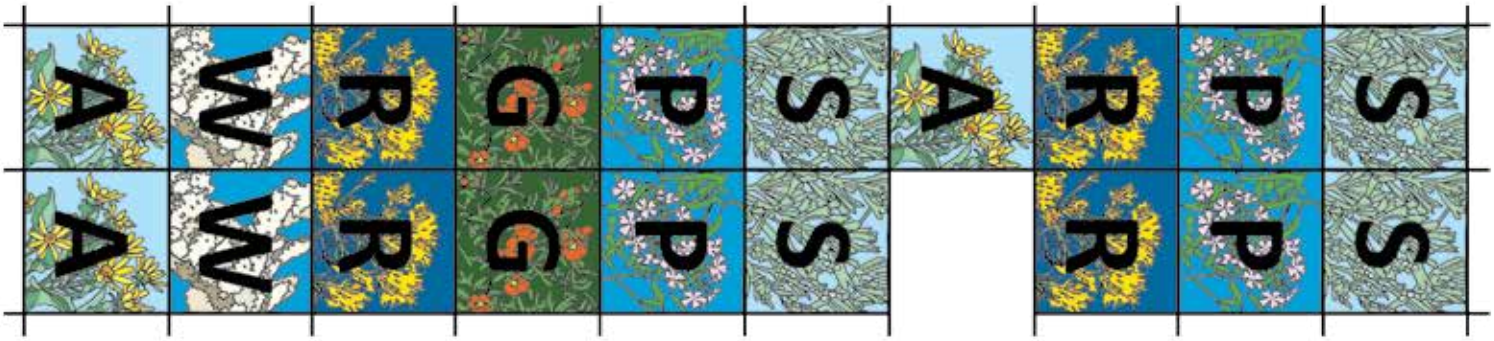
Think About It—Possible answers: control erosion, remove pollutants from the soil, remove excess water from soil, hold soil together, stabilize stream banks, anchor plants together, help plants survive drought

Untangle the Roots, p. 9

1. feeder roots
2. taproot
3. fibrous roots
4. root hairs
5. secondary roots

Mystery word: EROSION

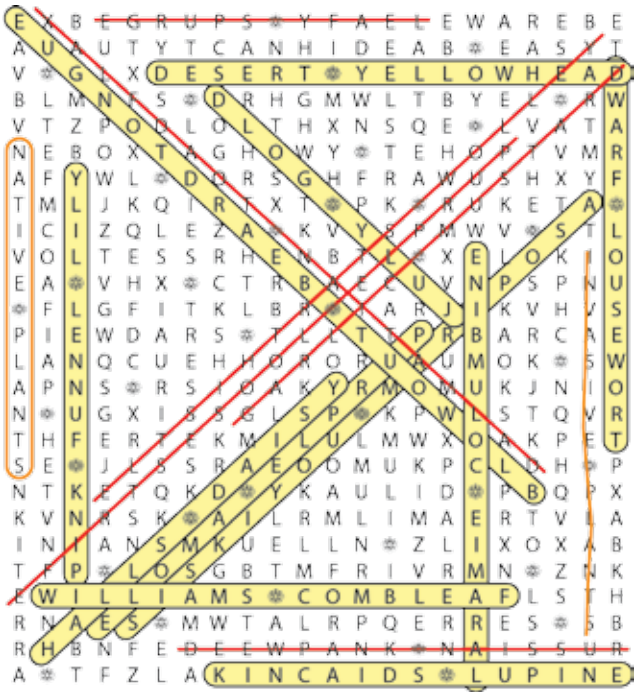




Restore the Balance, p. 11

W	A	G	R	S	P
R	S	P	A	G	W
A	G	W	P	R	S
P	R	S	W	A	G
G	P	A	S	W	R
S	W	R	G	P	A

Search for the Native Plants, p. 14



Hidden message: BEWARE! BEAUTY CAN HIDE A BEAST!

Building a Trail, p. 16

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 fawning ground. Trail B would damage the wetland.

Outdoor recreation planners have to think about the benefits and impacts of providing recreational activities. There are no “correct” answers to numbers 3 and 4.

JUNIOR RANGER

Ready For More?

Visit these BLM websites to learn more about native plants:

BLM Plant Conservation: *blm.gov/wo/st/en/prog/more/fish__wildlife_and/plants.*

BLM Learning Landscapes: *blm.gov/education*

BLM Volunteers: *blm.gov/volunteer*

To learn more about the native plants in your community, contact your public library, nature centers, or your state garden club. Here are some websites to help you get started:

United States Department of Agriculture (USDA) Plants Database: *plants.usda.gov*

Find your Public Library: *harvester.census.gov/imls/search*

Locate a Nature Center or Natural Area: *discovertheforest.org*

Locate your State Garden Club: *gardenclub.org/clubs/state-garden-clubs.aspx*

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Native Plants

Junior Ranger

Inches 1/4 1/2 3/4 1 2 3 4 5 6 7 8 9 10

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