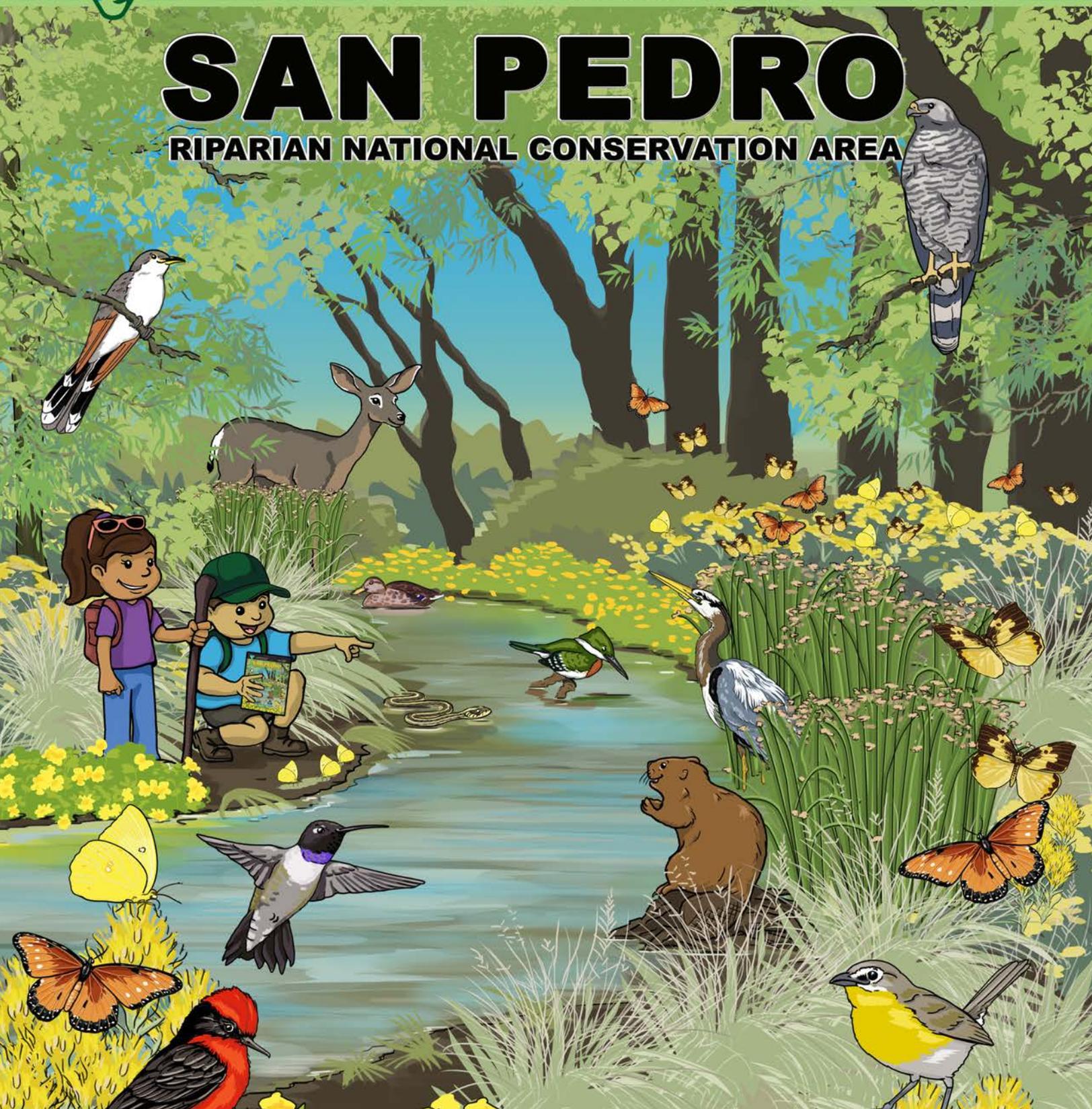


U. S. Department of the Interior  
Bureau of Land Management

Arizona - Gila District  
Tucson Field Office

# SAN PEDRO

## RIPARIAN NATIONAL CONSERVATION AREA



# Junior Ranger

## Activity Guide



# What is a Junior Ranger?

A Junior Ranger explores the environment around them.

A Junior Ranger cares for plants, animals, and the land.

A Junior Ranger encourages others to recreate responsibly.

## How to earn your badge and certificate

Complete six or more activities in this book.

To receive your Junior Ranger badge and signed certificate:

Bring your booklet to:

1) San Pedro House  
9800 East Highway 90  
Sierra Vista, AZ 85635-9173  
(520) 508-4445

OR

2) Bureau of Land Management,  
Tucson Field Office  
3201 East Universal Way  
Tucson, AZ 85756  
(520) 258-7200



**The Friends of the San Pedro River (FSPR)** is a volunteer, non-profit organization that is dedicated to the conservation, protection and enhancement of the natural and cultural resources of the San Pedro River. They work closely with the Bureau of Land Management (BLM), the federal land manager of the San Pedro Riparian National Conservation Area. They share their love for the river in a variety of activities. Volunteers assist visitors at the San Pedro House and Fairbank Schoolhouse. Docents lead nature and history walks, offer special events, give presentations, and provide educational programs for school children. Further information about FSPR is available at [www.sanpedroriver.org](http://www.sanpedroriver.org).



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**Illustrations:** Rachel Ivanyi, Lori Kovash (page 6)

**Species shown on front cover:** yellow-billed cuckoo, gray hawk, yellow-breasted chat, black-chinned hummingbird, vermilion flycatcher, Mexican duck, great blue heron, green kingfisher, queen butterfly, southern dogface butterfly, gartersnake, American beaver, mule deer, yellow monkeyflower, rabbitbrush, bulrush, sacaton, Fremont cottonwood, Goodding's willow.



# Welcome to San Pedro Riparian National Conservation Area (SPRNCA)

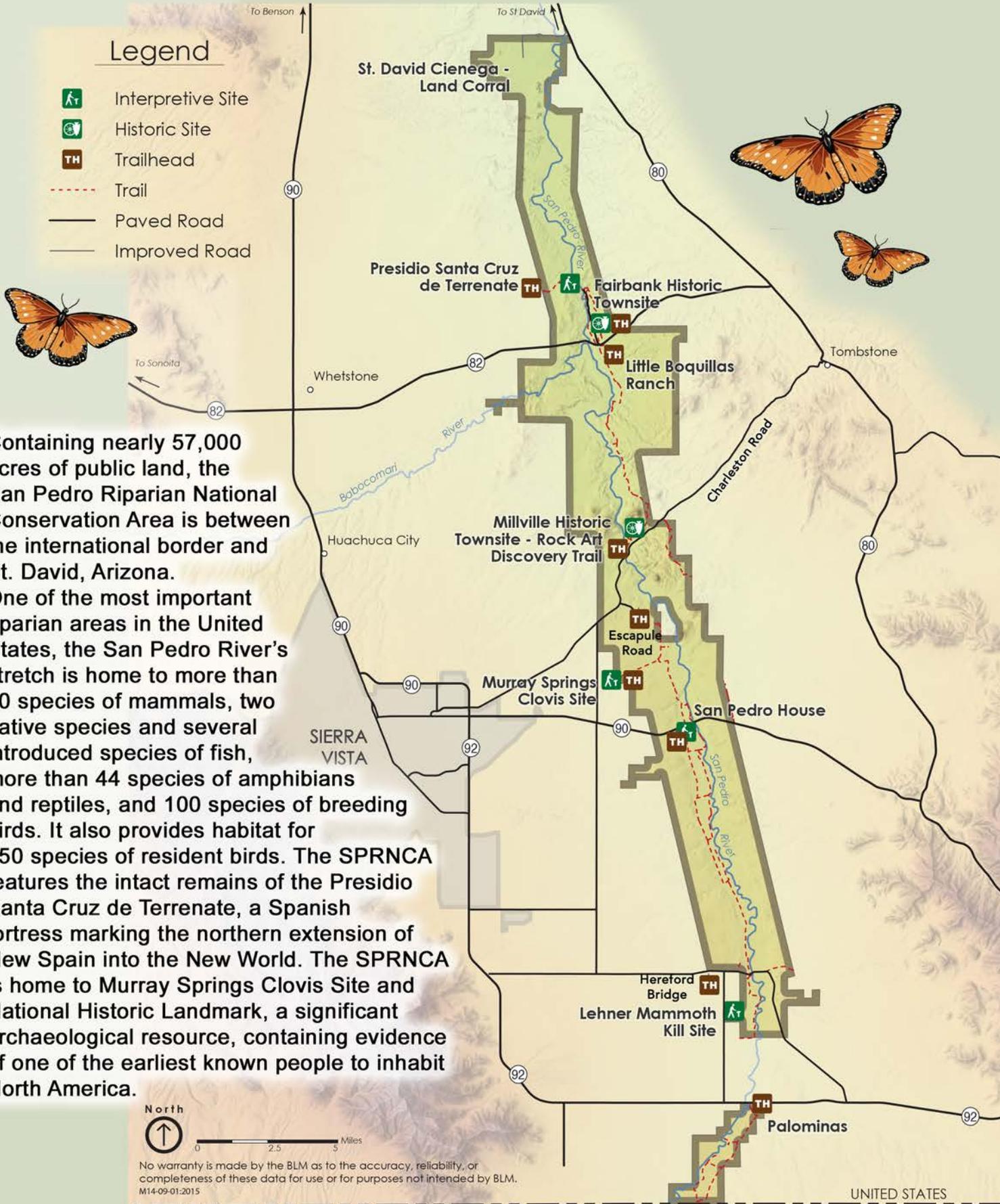
## Legend

- Interpretive Site
- Historic Site
- Trailhead
- Trail
- Paved Road
- Improved Road

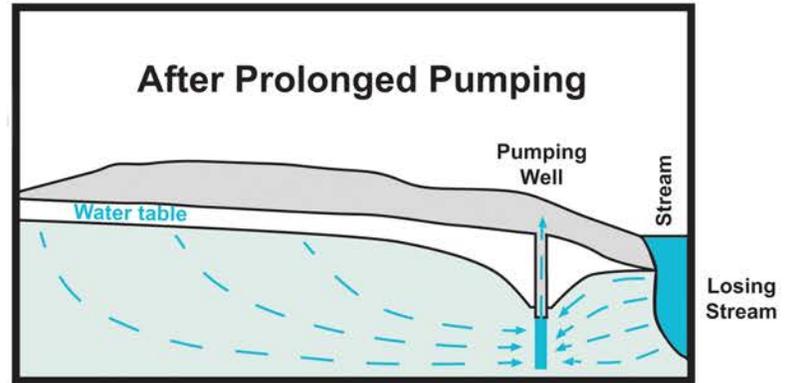
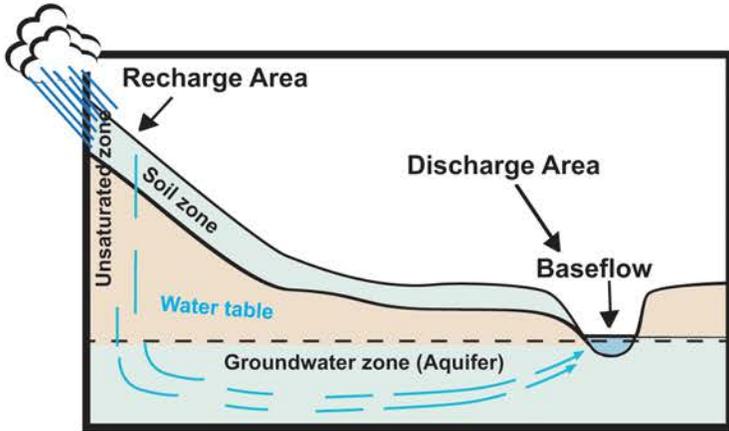
Containing nearly 57,000 acres of public land, the San Pedro Riparian National Conservation Area is between the international border and St. David, Arizona. One of the most important riparian areas in the United States, the San Pedro River's stretch is home to more than 80 species of mammals, two native species and several introduced species of fish, more than 44 species of amphibians and reptiles, and 100 species of breeding birds. It also provides habitat for 250 species of resident birds. The SPRNCA features the intact remains of the Presidio Santa Cruz de Terrenate, a Spanish fortress marking the northern extension of New Spain into the New World. The SPRNCA is home to Murray Springs Clovis Site and National Historic Landmark, a significant archaeological resource, containing evidence of one of the earliest known people to inhabit North America.



No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for use or for purposes not intended by BLM.  
M14-09-01-2015



# Where's that water from? Where's that water going?



Plants, animals and people need water to survive, but only a small percentage of the water on earth is available for their use at any one time. This water moves from the earth to the sky and back in the Water Cycle.

Clouds form when water vapor (a gas) cools and condenses into liquid water droplets. When the droplets get heavy, they fall from the sky (precipitate) as liquid (rain) or ice (snow, sleet or hail). Precipitation may flow across the surface in streams or rivers into lakes or oceans, or seep into the ground (infiltrate), where it is stored in soil that can hold water and release it slowly. This water-containing soil is called an aquifer.

Water is returned to the sky by evaporation (turning it into water vapor) from oceans, lakes, and transpiration in plants. Winds may move clouds to bring precipitation to distant places.

In areas with low levels of precipitation, like deserts and grasslands, people get water from an aquifer by digging wells. If they need more water from the aquifer than the Water Cycle can add to it (recharge), they may not be able to keep getting enough water from the aquifer. If the water table (top of the aquifer) drops below the reach of plants that need it, such as in places where streams and rivers dry up, trees that depend on the aquifer may die. Taking too much water from wells dug near rivers or streams might cause the rivers or streams to go dry.

People can help save groundwater by using less, planting xeriscapes (landscapes that require little or no irrigation), collecting rainwater that falls on buildings, and slowing down the surface flow so it can seep back into the aquifer.

Water falling from the sky as rain or snow is called \_\_\_\_\_.

Water returns to the sky from the land by \_\_\_\_\_.

An \_\_\_\_\_ is soil underground that can store water.

Water gets stored underground by a process called \_\_\_\_\_.

People dig \_\_\_\_\_ if they want to use underground water.

Name one thing people can do to help keep groundwater from being used up.

\_\_\_\_\_

# Cottonwood Trees and Water

Fill in the blanks with one of these words:

Shelter	Beavers	Seeds
Insects	Shade	Wounds
Scientist	Root	Wind

Birds like yellow-billed cuckoos, tanagers, nuthatches and warblers find \_\_\_\_\_ to eat on the bark, branches and leaves of cottonwoods.

Many birds, including woodpeckers, goldfinches, Cooper's hawks, western screech-owls, and great-horned owls, use cottonwoods for \_\_\_\_\_ and nest sites.

The cottony parts of cottonwood trees are the fluff attached to the tiny seeds. It helps them float on air currents to new places to grow. \_\_\_\_\_ also carries pollen from male to female trees.

A skin cream made from cottonwood bark is said to help \_\_\_\_\_ heal.

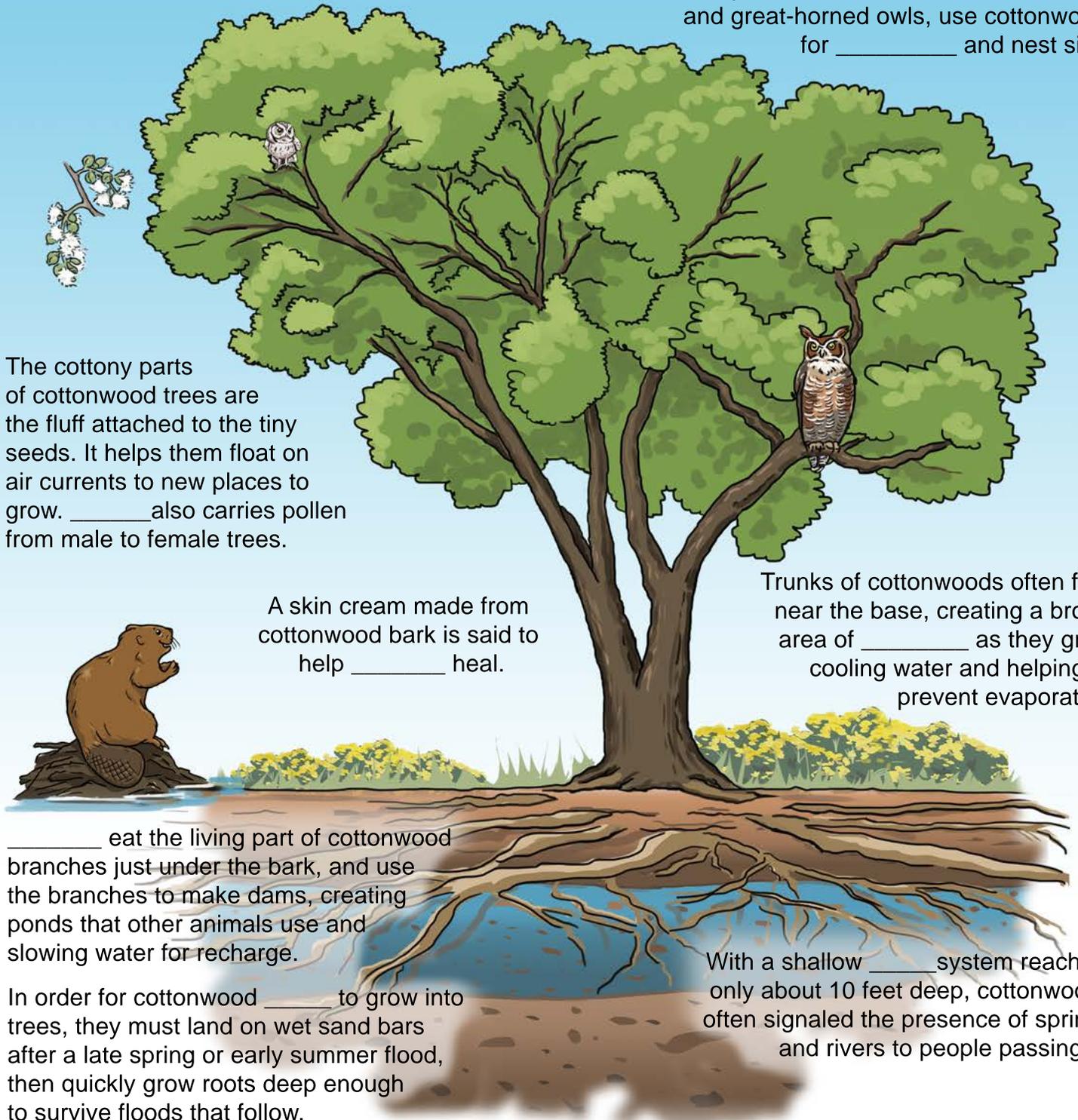
Trunks of cottonwoods often fork near the base, creating a broad area of \_\_\_\_\_ as they grow, cooling water and helping to prevent evaporation.

\_\_\_\_\_ eat the living part of cottonwood branches just under the bark, and use the branches to make dams, creating ponds that other animals use and slowing water for recharge.

In order for cottonwood \_\_\_\_\_ to grow into trees, they must land on wet sand bars after a late spring or early summer flood, then quickly grow roots deep enough to survive floods that follow.

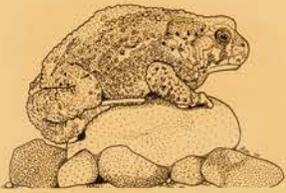
With a shallow \_\_\_\_\_ system reaching only about 10 feet deep, cottonwoods often signaled the presence of springs and rivers to people passing by.

Fremont cottonwoods are named for explorer and \_\_\_\_\_ John C. Fremont.



# SPRNCA Bingo

The San Pedro Riparian National Conservation Area is home to a wide variety of plants and animals. You can observe many of them by walking through the mesquite grassland surrounding the river, and under the trees alongside the river channel. Below is a list of some of the common plants and animals that live near the San Pedro River. See if you can find four in any row, column or diagonal in the chart below.



toad



butterfly



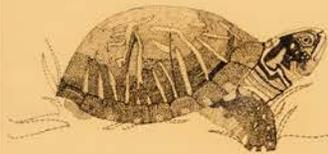
hawk



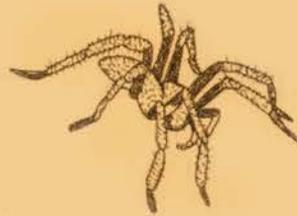
harvester ant nest



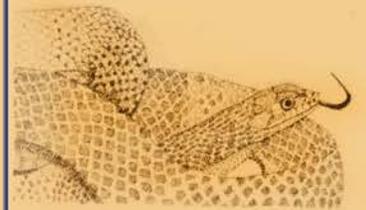
yucca



turtle



spider



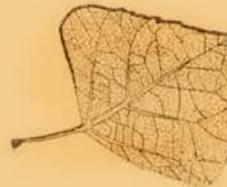
snake



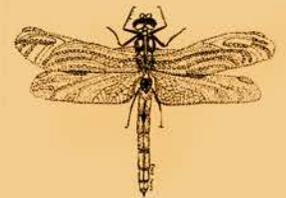
fish



lizard



cottonwood leaf



dragonfly



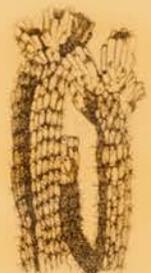
bird



mesquite



gourd



cactus

# Animal Adaptations

Adaptations are structures or behaviors that help an organism (a single living thing) survive in its habitat (place where it lives). What are some adaptations of SPRNCA animals and plants that help them survive in the SPRNCA?

Write the plant or animal after its adaptation.

Stays wet when water levels in the river drop during the day by hiding in mats of algae or under logs or stones in the river.

This creature cannot fly, so it sprays an irritating chemical from its rear end at predators.

Has poor eyesight and can't run fast, but it has long, sharp teeth like spears ("javelin" in Spanish) for defense, and scent glands to rub on rocks and trees to signal other members of its species.

Has light-colored hairs on its leaves to reflect sunlight and can grow in soil with high levels of salt.

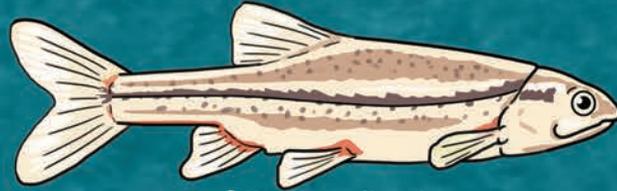
Tongue is very long and has a sharp tip with hooks that can help it pull soft grubs out of wood.

Can bury itself underground and surround itself in a case that keeps it from drying up between summer rainy seasons.

Has an upturned snout that helps it dig for lizard eggs in sandy soil.

Has barbed hairs that can irritate a predator that gets too close, much like a porcupine's spines.

Can't easily outrun predators, so it puffs up with air, spreading out its horns, and shoots blood from its eye sockets to confuse its foe.



Gila longfin dace



Gila woodpecker



Javelina



Desert tarantula



Horned lizard



Hog-nosed snake



Four-winged saltbush



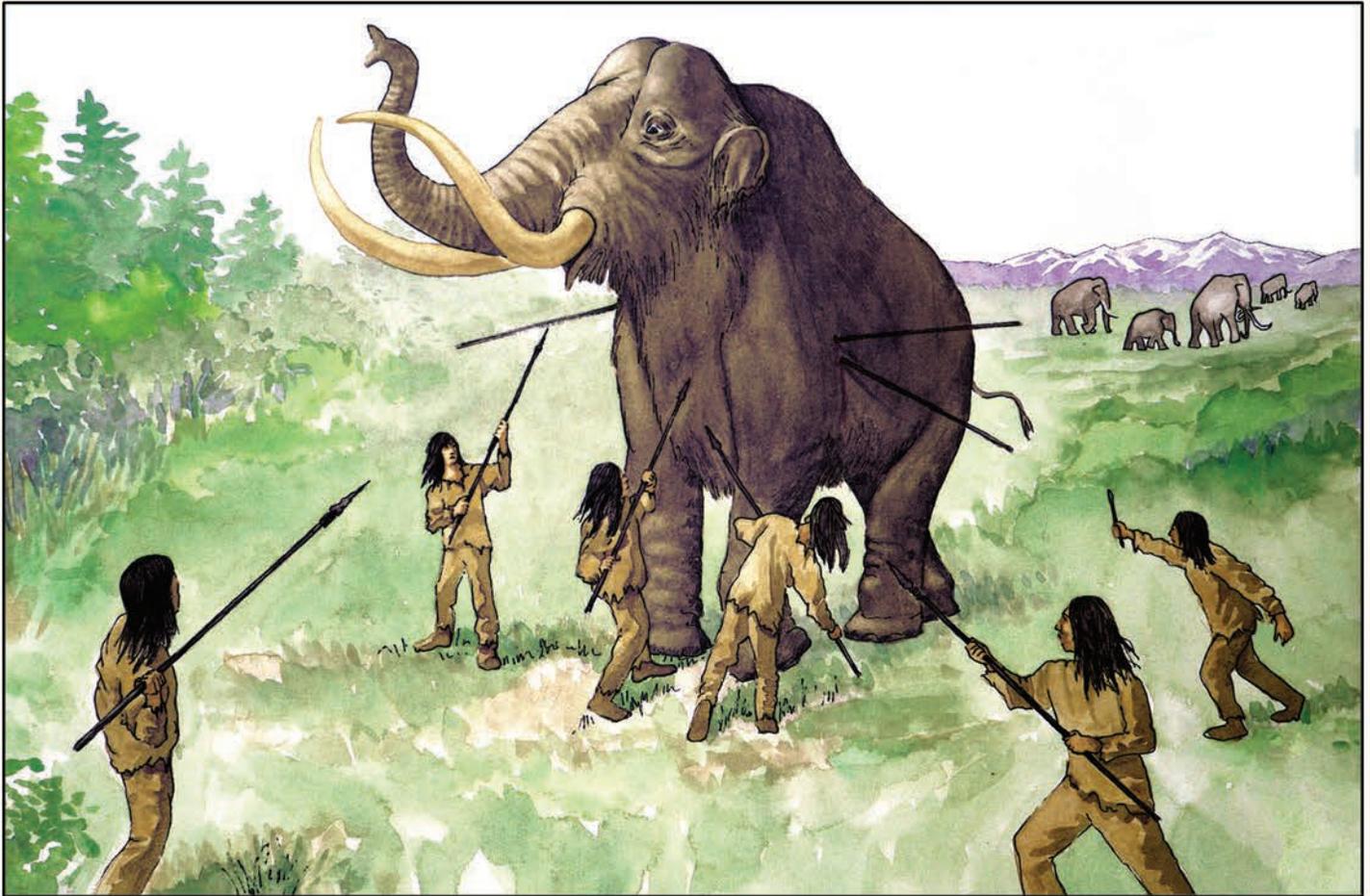
Pinacate beetle



Spadefoot toad

ANSWERS: Gila long-finned dace; Pinacate beetle, javelina; four-winged saltbush; Gila woodpecker; horned lizard; spadefoot toad; hog-nosed snake; desert tarantula.

# Murray Springs - Ancient Hunting Site



Picture: Clovis hunters throwing atlatl spears at a mammoth.

The Clovis were the first people known to have lived along the San Pedro River, 13,000 years ago. These ancestral Native Americans were wandering hunters looking for large game animals like mammoth (related to elephants) and bison (similar to buffalo). The Clovis hunters used an atlatl (AT-LAT-TIL), a throwing stick that propelled a spear a great distance. One large animal could provide enough food for their group for many days.

At the time of the Clovis, Murray Springs was a marshy area that attracted animals. It was a good spot for Clovis hunters too, since animals in the marsh couldn't move as quickly to escape. Archaeologists have found bones from mammoths and bison the Clovis killed at this site. A camp was found nearby where the Clovis butchered and cooked animals, and made stone tools, including distinctive spear points.

## Activity:

*What people in our area ate changed over time. At first they mainly ate meat from animals they hunted. Later, they added wild foods like mesquite beans. Finally they mostly ate the corn, beans and squash they grew.*

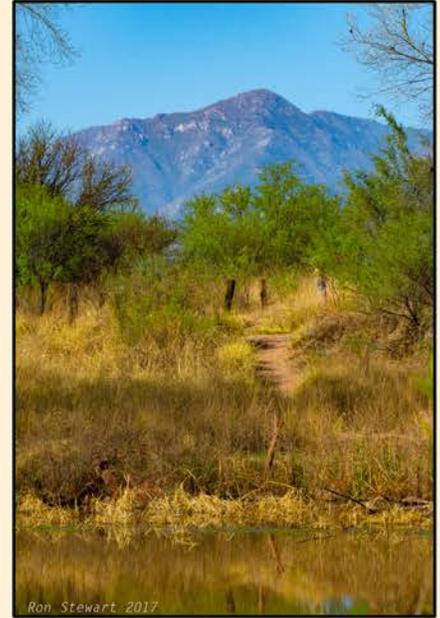
## What do you eat?

*Write a list of at least 5 things you eat almost every day. Did the Clovis people eat some of the same things? Choose yes or no.*

Things I eat every day:	Yes	No
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

## Place Names on the SPRNCA

The San Pedro National Riparian Conservation Area is an important area to Native American people. The most recent Native American tribes to call this area home are the Apache, Tohono O'odham, Zuni, and Hopi people. They have migrated out of the area, but they still come to visit their ancestral homeland by the river.



The San Pedro River and the surrounding areas are called many different names by different groups of people. Early American settlers called the San Pedro River the “Beaver River” for all the beaver they found and hunted there. American Indian place names describe the features of the land and water. Important stories are also connected to the land and are reflected in the place names. The Apache refer to the San Pedro as “tulchi” which means “red water”.

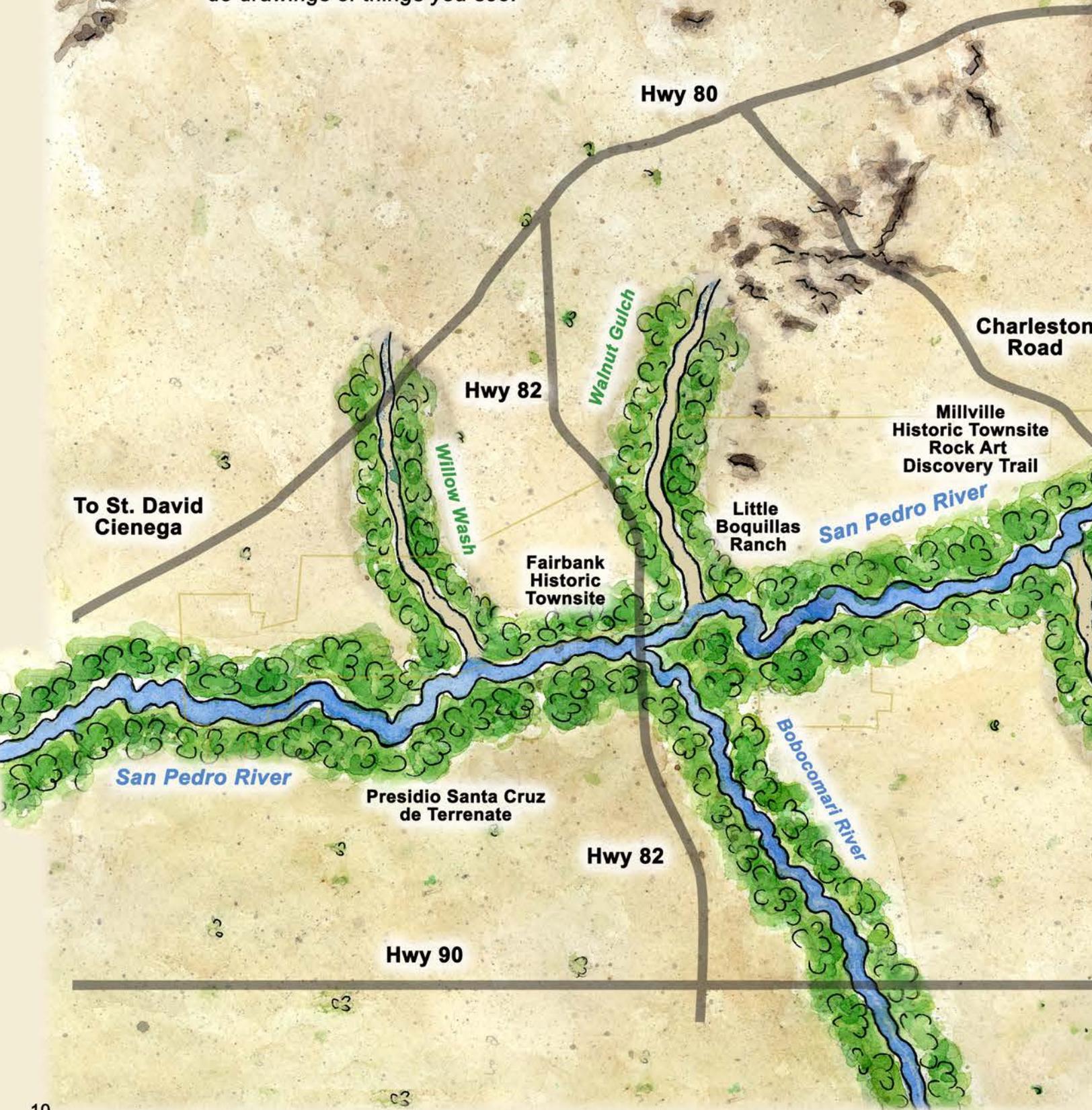


Picture: Huachuca Mountains - The Tohono O'odham name for Huachuca Mountains are “Vav chukadag” which means “moss or lichen that grows on a northerly facing slope.”

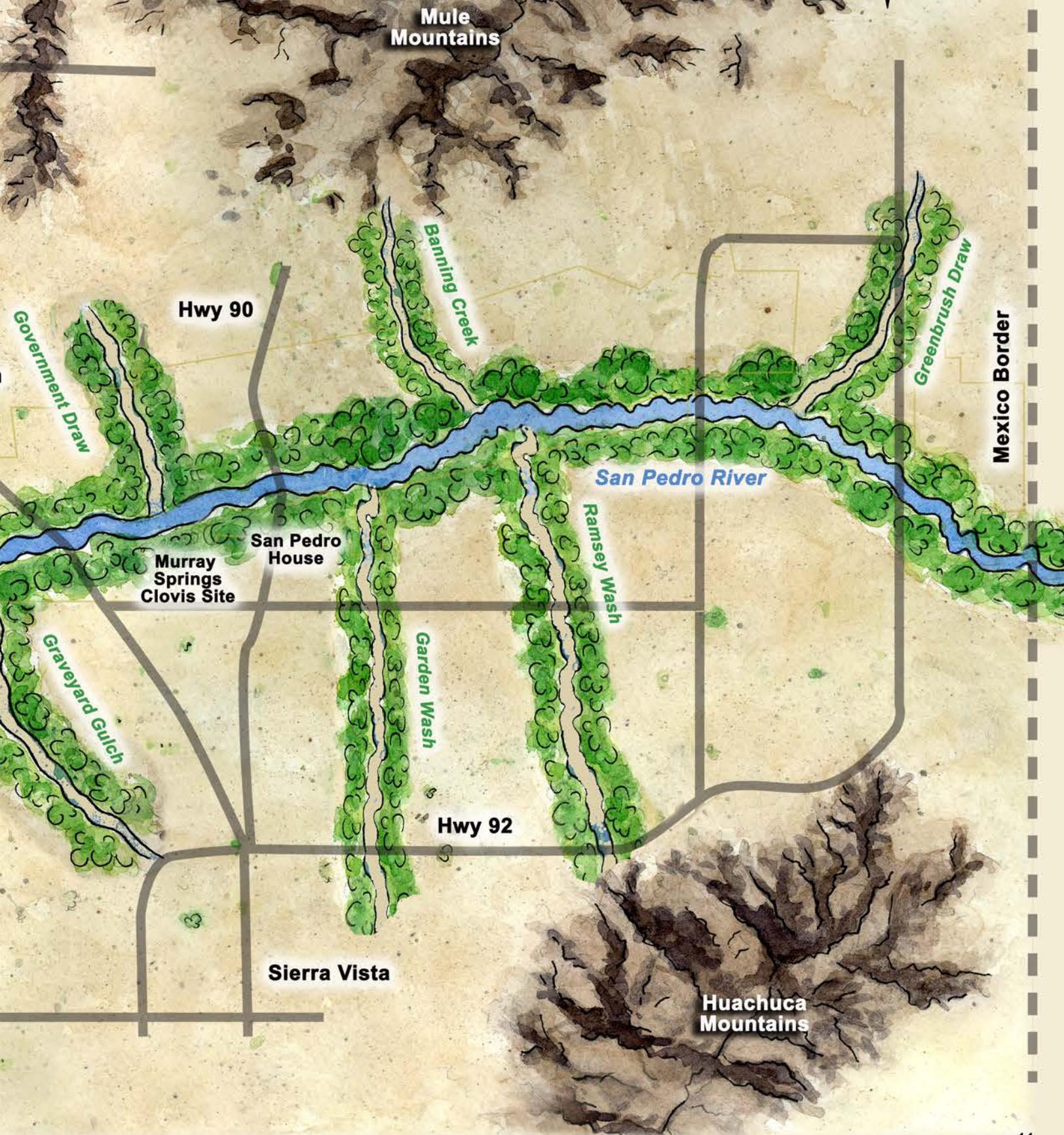
If you were naming the San Pedro what would you call it? \_\_\_\_\_

# San Pedro Riparian National Conservation Area

Place stickers on locations you visit while you are here. You can also write notes and do drawings of things you see.



# ervation Area - Map Your Visit



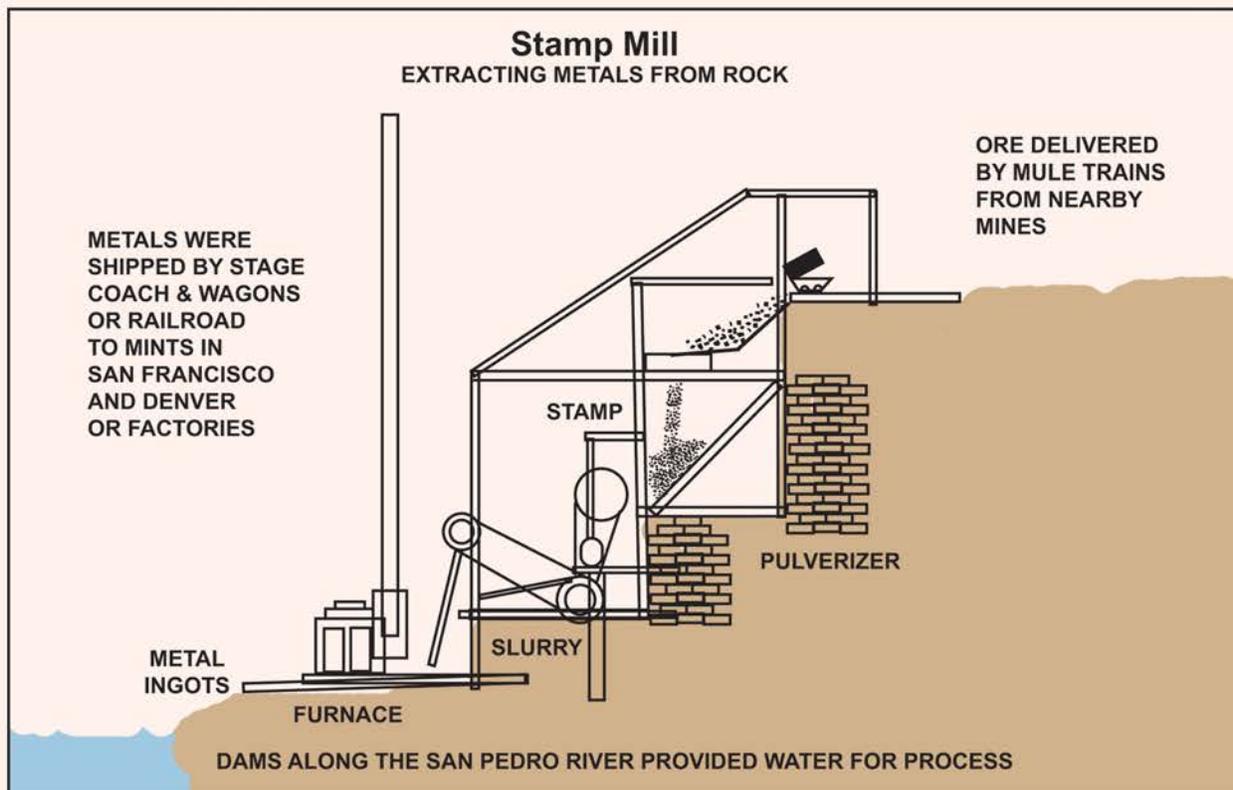
# Mines to Mills to Mints and Beyond

Rich silver veins were discovered in the hills near modern-day Tombstone in 1877. Miners dug shafts to remove the ore that contained the silver. The ore was taken in wagons to a mill with machinery to process the rock. First, the ore was crushed into pebbles and then powder. It was then mixed with water to make a slurry (paste). Mercury was added to the slurry to make a pulp. Finally, the pulp was heated in a furnace to evaporate the mercury and water to produce ingots of the metal extracted from the ore, mostly silver, but also other metals such as gold, copper, lead and tungsten.

Milling the ore required large quantities of water. Boilers would heat water to form steam to power the machines in the mills. Water was also mixed with the crushed ore in the mill. The only adequate source of

water was the San Pedro River and because of that the first mills were located there. Dams were built to pool the river water and then move it through ditches and flumes (wooden troughs) to the mills.

Once the ore was reduced to metal ingots at the mill, the ingots were loaded onto wagons and then trains for shipment. Millions of dollars in metal passed through Fairbank on the railroads. The first stop for the ingots was a smelter, where they were melted and separated into pure metals. Some of the metal ended up in factories at places like Chicago or New York where it was used to create products sold all over the world. Most of the silver was sent to Federal mints in San Francisco and Denver to be made into coins.



## Activity:

Can you name the coins that contain silver?

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Can you name something you have used made of lead or copper?

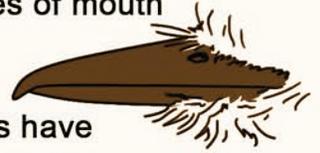
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# SPRNCA Bird Beak Adaptations

**Gila Woodpecker** – Sharp, narrow beak pairs with powerful neck muscles to make nest holes and probe for insects in wood.

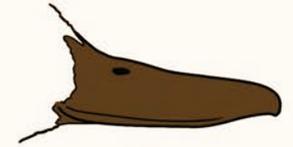


**Black Phoebe** - Wide mouth with short beak and sensory feathers at edges of mouth help it catch insects in flight.



**Pyrrhuloxia** – Cone-shaped beak with broad base has power to crack seeds open.

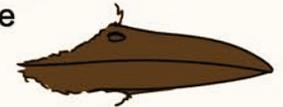
**Mexican Mallard** – Bill edges have tiny, toothlike structures to strain small plants and animals from water.



**Red-tailed Hawk** – Upper jaw overhangs lower with sharp, hooked tip for tearing meat from reptiles, birds and mammals.



**Yellow Warbler** – Narrow, short beak can fit into cracks in tree bark for insects.



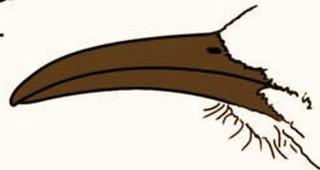
**Great Blue Heron** – Long beak with sharp tip works with long, flexible neck to spear fish, frogs and crayfish from ponds.



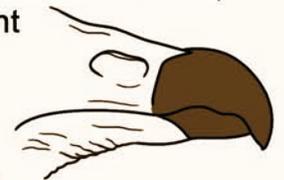
**Black-chinned Hummingbird** – Long, narrow beak fits into tubular flowers to reach nectar, and is also good for snatching small insects from the air.



**Curve-billed Thrasher** – Long, down-curved beak for digging in soil and leaf litter for insects.



**Turkey Vulture** - Hooked beak like a hawk's, but featherless head to prevent contamination with decaying flesh from its food source of dead animals.



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

*Find the names of the birds in the word search. Names may be forward, backward up, down, or sideways.*



The sun is the source of energy for life on earth.



# The Food Web

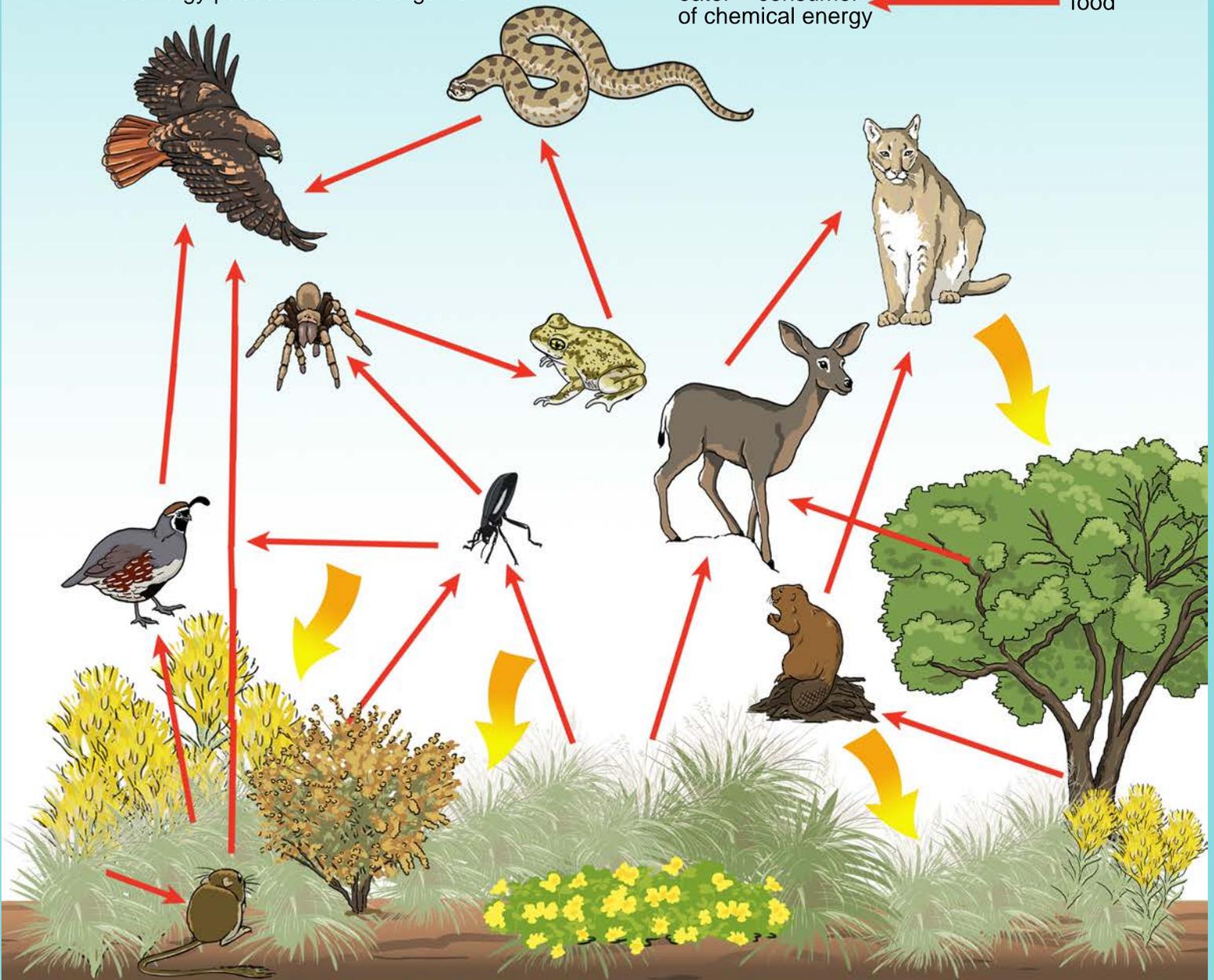
- 1 What kind of living thing gets its energy from the sun?  
(Hint: yellow arrows) \_\_\_\_\_
- 2 Name an animal that eats more than one kind of food. \_\_\_\_\_
- 3 What would happen to the food web if all the grass died? \_\_\_\_\_
- 4 What do plants make that animals need? \_\_\_\_\_
- 5 Name a type of living thing that can return nutrients to soil or water for plants to use. \_\_\_\_\_

Living things with a green pigment called chlorophyll (klor-e-phil) (plants, algae and phytoplankton (fy-toe-plank-ten) can convert the sun's light energy to chemical energy in the form of sugars and starches that other living things can eat.

another through a network of food chains that make up a web of energy flow relationships (food web), ending with decomposers such as bacteria and fungi, which return nutrients to soil and water where green organisms can recycle them.

This energy passes from one organism to

eater = consumer ← food of chemical energy



# Precious Water - Xeriscapes

How can we save water and plan a beautiful yard that attracts wildlife? We can plant a xeriscape (zeer-e-scape), a landscape designed to use plants that don't need much water. We can store water that falls on building roofs using rain gutters, downspouts and barrels.

We can choose plants that don't need a lot of water. Many of these have flowers that hummingbirds and butterflies like.

To slow down evaporation, we can cover the ground with landscape cloth underneath crushed rock or bark.

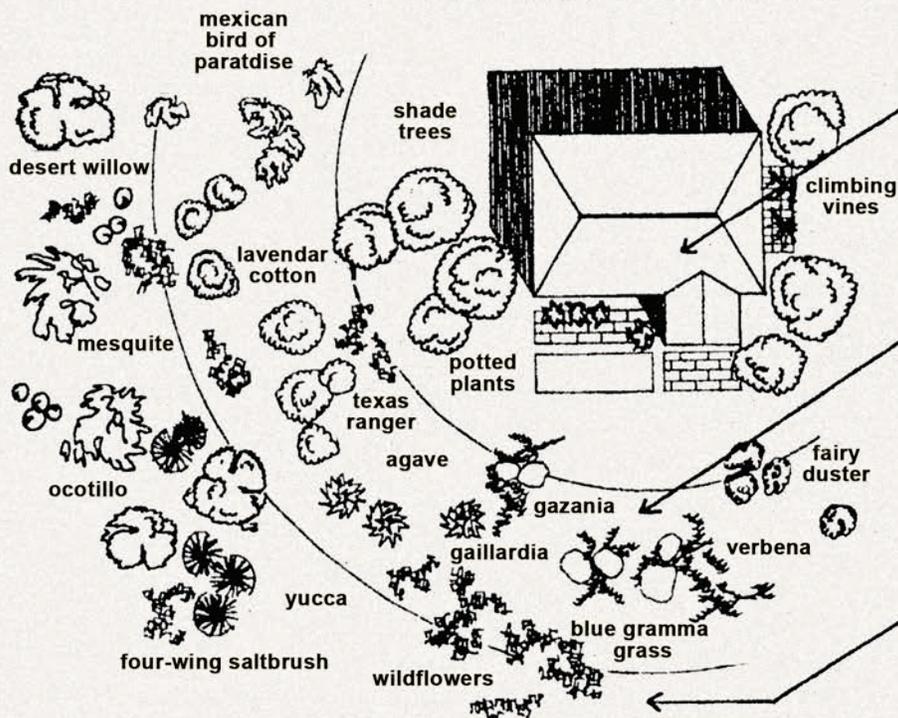
Deciduous trees can shade windows in summer and allow warmth in during the cooler months.

Irrigation tubes can be connected to the water storage barrels to take small amounts of water further from the house to smaller plants that need help during dry times.

## SAVING WATER

*Draw a xeriscape design for your yard at home.*

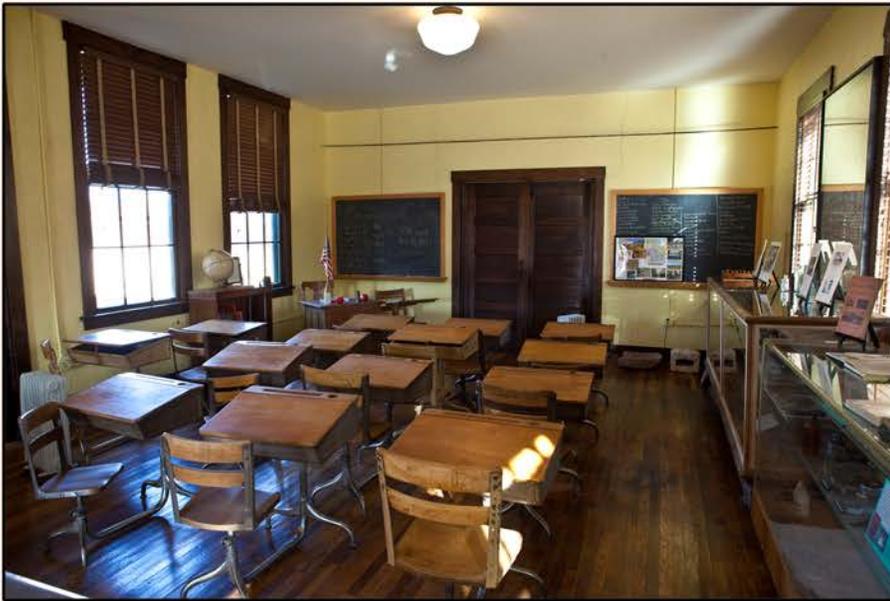
## XERISCAPE LANDSCAPING TECHNIQUES



- Zone 1** Mini oasis  
Patio with potted plants  
Deciduous trees outside south-facing windows  
Water storage tanks attached to downspouts
- Zone 2** Lower water use plants  
Rain gutters with berms or French drains to channel or detain water  
Contoured yard, drip irrigation  
Landscape fabric to retard weed growth
- Zone 3** Low water use plants, native plants when possible

# Fairbank Townsite

Starting in 1882, Fairbank grew up around a train depot just east of the San Pedro River. The people of Fairbank worked for the railroads, in stores, for the Chinese farmers, and as cowboys. As the town grew, a school was built that taught first grade through eighth grade. The first school burned down in 1920 and was replaced with the building that is still standing. Up to 50 students went here, divided into two classes by age, taught by two teachers. When you visit the school today, it looks much like it did in historic times, with desks and chalkboards.



*Compare your school with the Fairbank school in the pictures. What differences do you see? Write them below.*

My school today:

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Fairbank School:

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# Bats of the SPRNCA - Mammals that Fly

The SPRNCA is home to about 25 bat species that use a variety of food sources.

There are more than 1,000 species of bats worldwide. The only mammals that can fly, bats are seldom seen because they are nocturnal (active at night) and shelter out of sight by day.

Bats' wings are made of a thin membrane stretched between extra long finger bones.

They use their short thumb bones to climb to a good height for taking off.

Bats are important members of many different ecosystems (areas where living things interact with each other and their non-living surroundings). Some bats control populations of arthropods (animals with jointed legs and exoskeletons, like insects and spiders), and others pollinate flowers and/or spread seeds of the plants whose fruits they eat.

*See if you can match the bat with what it eats. Each bat's head has adaptations (structures that help it survive where it lives) that make it easier to find and eat its food.*

1. Which bat flies with its mouth open to send out sounds that bounce off the flying insects it hunts? This is called echolocation. It also has a structure in front of its ear opening to direct sound into the ear canal.

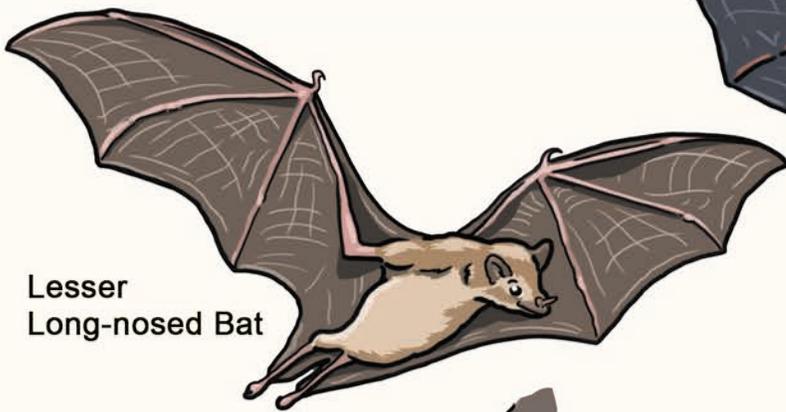
\_\_\_\_\_

2. Which bat has small ears, large eyes and a long nose with a leaf at the tip to see and smell cactus and agave flowers and cactus fruits?

\_\_\_\_\_

3. Which bat has long, wide ears and a short nose for hunting and eating insects, scorpions, and centipedes on the ground?

\_\_\_\_\_



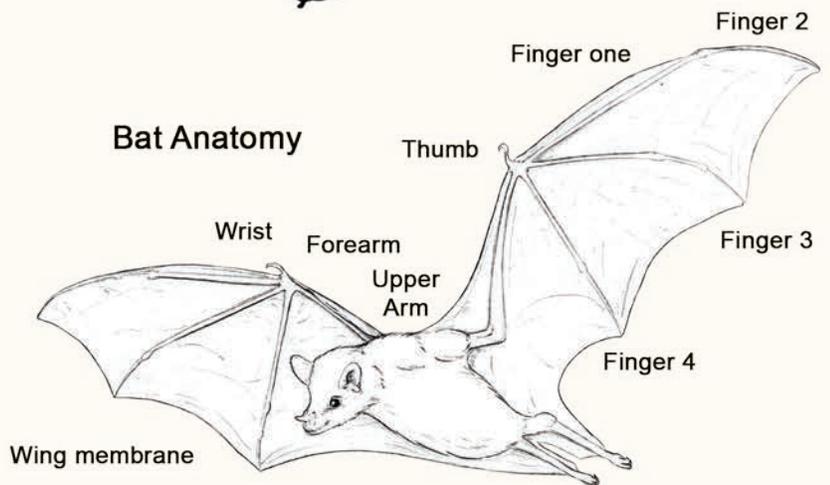
Lesser Long-nosed Bat



Pallid Bat



Cave Myotis

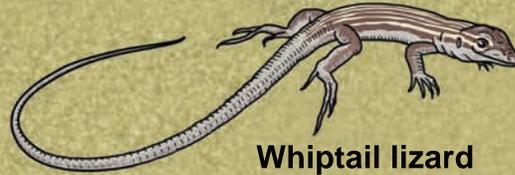


# Animal Tracks at San Pedro Riparian National Conservation Area

Draw a line from the track to the animal that makes it.



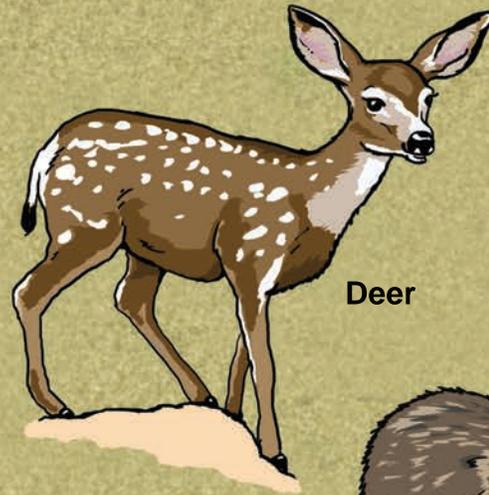
Roadrunner



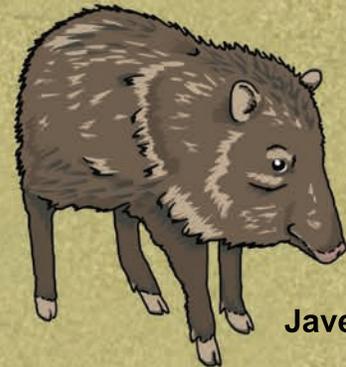
Whiptail lizard



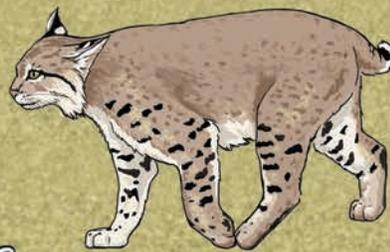
Beaver



Deer



Javelina



Bobcat



Raccoon



## Tracking Tips

1. Walk slowly and quietly - if you are lucky you may see the animal.
2. Tracks are easier to see in the mud.
3. Many animals come out only at night so look for tracks early in the morning.



NATIONAL  
CONSERVATION  
LANDS

## More Places to Play and Learn on the National Conservation Lands





# Junior Ranger Oath

I promise to help protect the San Pedro Riparian National Conservation Area, public lands, my community, and the earth by being an active and responsible steward of the environment.

I promise that I will not feed wild animals.

I promise to leave rocks, plants, artifacts and historic objects as I found them for everyone to enjoy.

I promise to continue to explore, learn about, and respect the world wherever I go.

I promise I will share what I learn with others.

Signed \_\_\_\_\_

Date \_\_\_\_\_

