



NATIONAL
CONSERVATION
LANDS

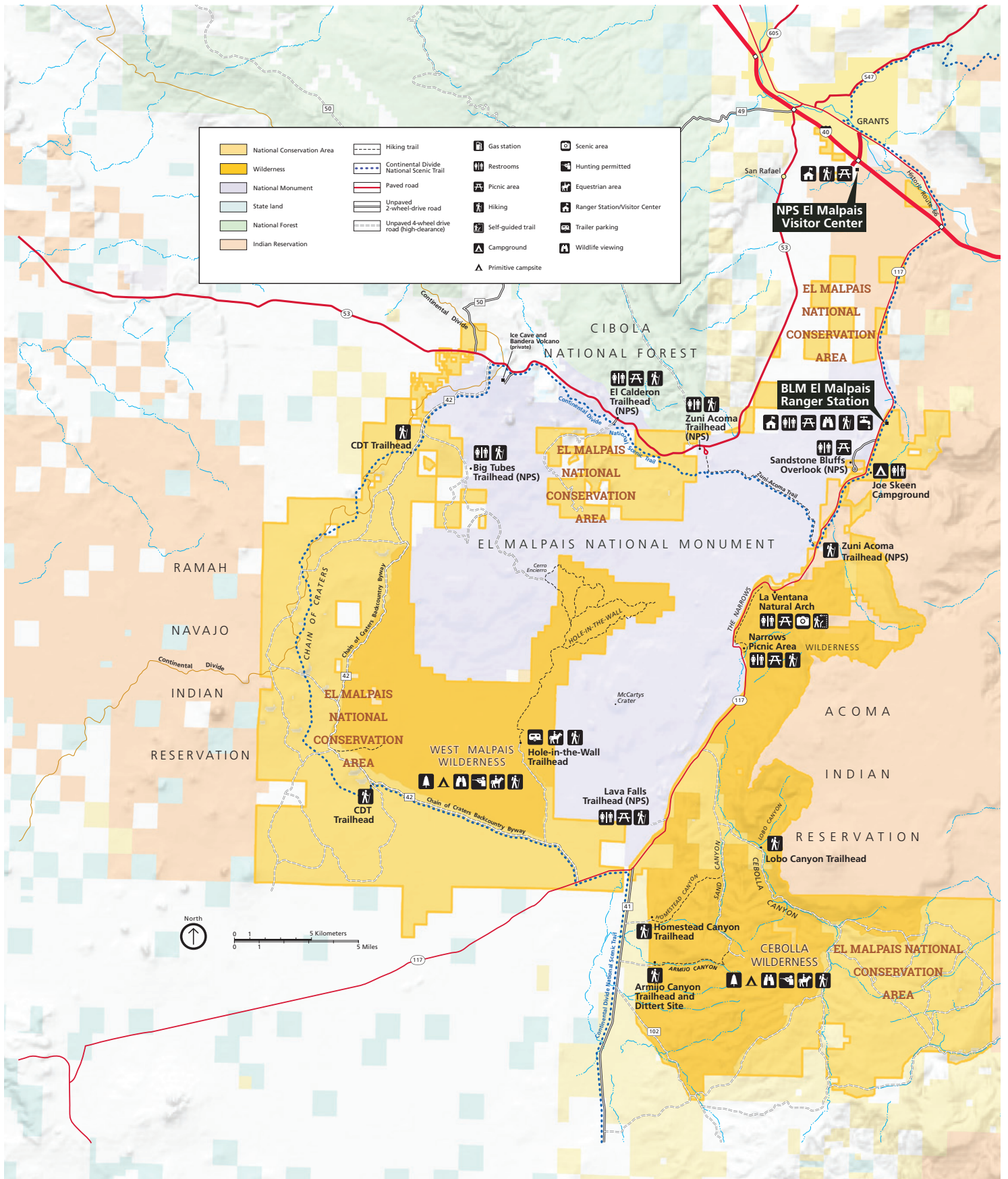
New Mexico

El Malpais
National Conservation Area

Junior Ranger Guide



This guide belongs to:



Welcome to El Malpais

The Bureau of Land Management (BLM) is a federal government agency that cares for more than 245 million acres of public lands. These lands belong to all Americans, including you! Together the BLM and the National Park Service take care of the area known as El Malpais. The BLM National Conservation Area (NCA) invites you to hike, camp, backpack, hunt, and so much more! Welcome and we hope you enjoy learning about this special place.

El Malpais NCA acknowledges that it exists on traditional and ancestral homelands to many indigenous tribes and pueblos, including the Ramah Navajo, Acoma, Laguna, and Zuni. These indigenous peoples continue to foster a deep connection with this land. Through consultation and open conversation, the BLM is striving for improved relationships with indigenous groups and for a broader public awareness of the history that has led to the current land status of El Malpais.

Did you know that El Malpais is Spanish for "the badlands"? Spanish explorers used this name to describe the area because it was very hard to cross on horseback.



The Continental Divide National Scenic Trail (CDNST) is a 3,100-mile long trail that runs all the way from Mexico to Canada! Every year, people from all over the world hike the CDNST. The CDNST crosses the dry lava fields and grasslands of the NCA. Make sure to pack enough water for all of your adventures in El Malpais!

Lands in Public Hands

BLM lands are used by many people for many reasons! Read below to find out more.

ACTIVITY: Find the **BOLD** words in the descriptions to complete the activity.

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

Who can use **public** lands?

1. You, your family, friends, and pets for **recreation**. You can **hike**, camp, hunt, and more on BLM land.

2. **Indigenous** people foster close ties to the land with traditional celebrations and **cultural** uses.

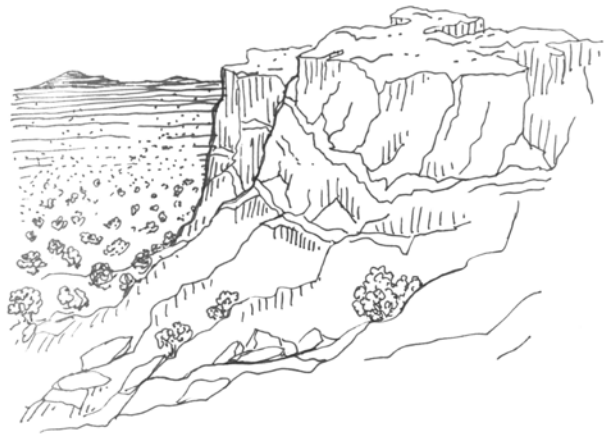
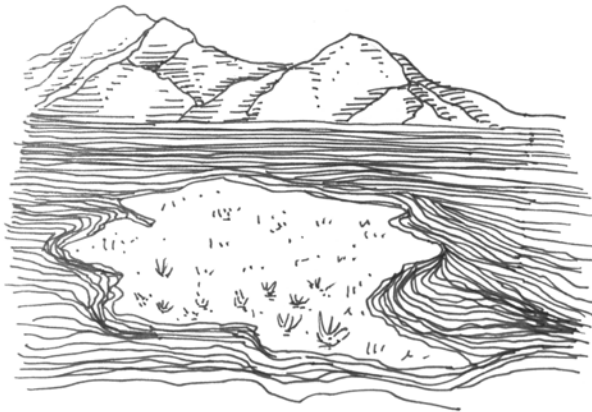
3. Scientists and researchers study natural and cultural resources, including **biology**, geology, **archaeology**, and **conservation**.

4. Ranchers who own **livestock** lease the **land** for grazing.

Rockin' Out!

El Malpais has very unique geology. Geology is the study of the earth's structure and rocks, and how they change over time. El Malpais has been the bottom of several shallow seas, a sandy desert, and filled with erupting volcanoes throughout geologic history!

ACTIVITY: Draw a line to match the definitions and pictures to learn about the geology of El Malpais.

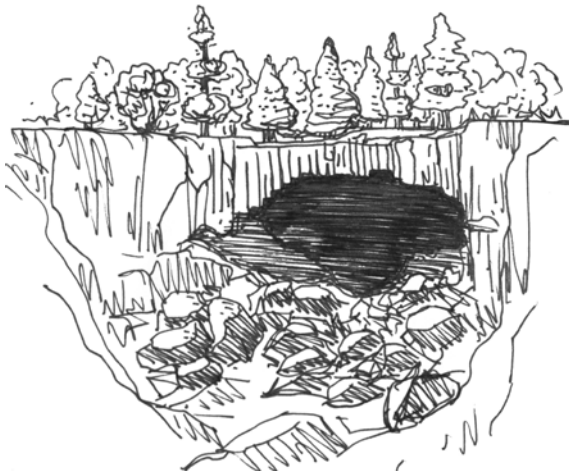


Sandstone cliffs
cliffs of a light
colored rock with lots
of room for nesting
birds

Kipuka
(key-pu-kah)
an island of
land completely
surrounded by lava

Tinajas
(teen-ah-ha)
pool-like depressions
in sandstone that fill
with water

Cave
collapsed lava tube
that is home for bats



Caves at El Malpais are partially collapsed lava tubes. Lava tubes are formed when the surface of a lava flow has cooled and hardened and the hot, liquid interior drains out and leaves behind a hard shell.

Three of the words below are Hawaiian. Can you guess which ones? Remember, there are many volcanoes in Hawaii!

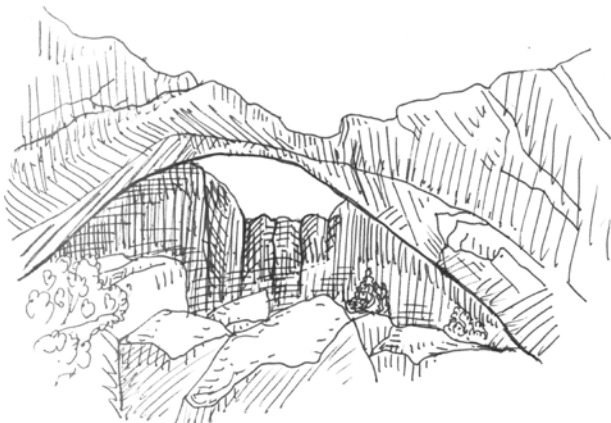


Pāhoehoe
(pa-hoy-hoy)
smooth, ropy lava flow

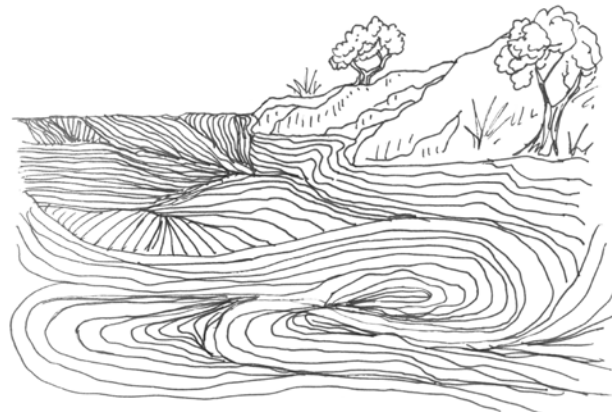


Tree mold
formed when lava surrounds a tree and burns it up, leaving an impression of the trunk

'A'a (ah-ah)
broken, jagged lava flow



La Ventana Arch
the second largest natural arch in New Mexico



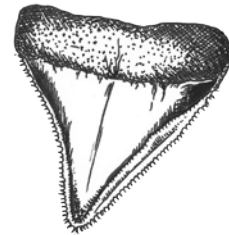
Finding Fossils

Fossils are common in El Malpais. We have fossils of *shark teeth* and marine *bivalves* or clams, at El Malpais even though we are thousands of miles from the ocean today. The BLM Ranger Station Nature Trail is a great place to look for fossils. Keep your eyes open and you might see *ripple marks* preserved in sandstone.

ACTIVITY: *Unscramble the words below to discover the identities of these mystery fossils.*



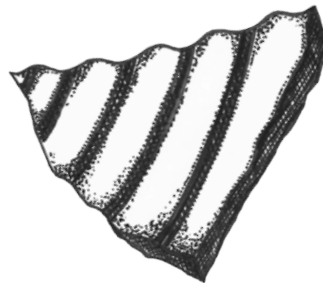
optcioerl
A piece of fossilized poop



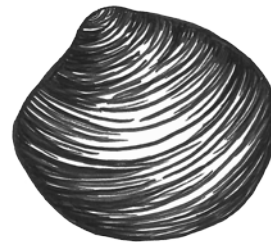
rskha tohot
From the mouth of a marine predator

A **coprolite** is a piece of fossilized poop. Coprolites give scientists clues about what ancient animals like dinosaurs ate!

Leave fossils where you find them!



rpeilp masrk
Wave marks in sandstone from ancient tidal flats

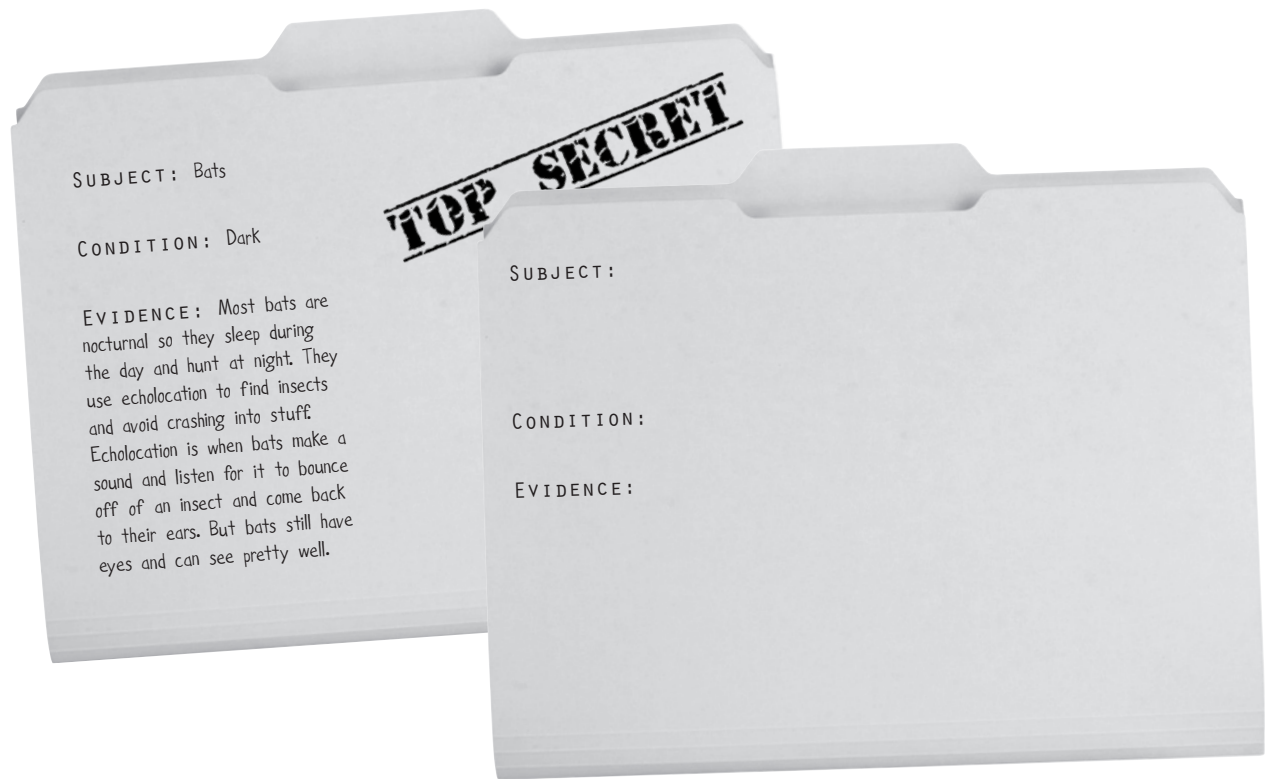
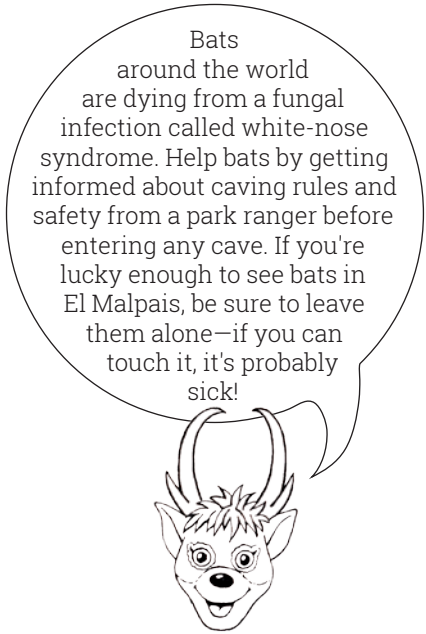


bievavl
A clam with two shells

Amazing Adaptations

Hey Junior Detective, read the case file below from Officer Seymour to find out how bats have adapted to survive in El Malpais! An adaptation is when an organism changes to survive better in its environment. Adaptations can be a change to an animal's body or its behavior!

ACTIVITY: Write your own animal adaptation case file in the space provided! Need help? Look around the Ranger Station for other examples of adaptation.



Animals Gone Wild

Many animals call El Malpais home and each one plays an important part in keeping El Malpais diverse. Diversity in nature helps create connections between plants and animals and allows them to live with and rely on one another.

Animals need water, food, and shelter to survive. Look around you for those essentials.

ACTIVITY: *If you could be one of the animals that lives at El Malpais, which would you be and where would you live? Draw or write about what you might do on a typical day.*

Just like bats, all wild animals prefer to be away from humans. It can be dangerous for animals and people to get too close! If you see an animal at El Malpais, leave it alone and watch it from a distance.



Roadrunners are the state bird of New Mexico. They can run up to 20 miles per hour (faster than most people) and sometimes eat rattlesnakes!

ACTIVITY: Play a game of "I Spy" and check off the animals that you see while in El Malpais.



Tarantula



Deer



Bird of Prey



Lizard



Spider



Pronghorn



Horse



Grasshopper



Prairie Dog



Bobcat



Snake



Hummingbird



Bat



Wild Turkey



Coyote



Human



Bird



Elk



Cow



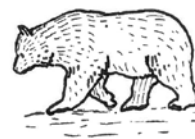
Roadrunner



Bug



Duck



Bear



Piñon Jay

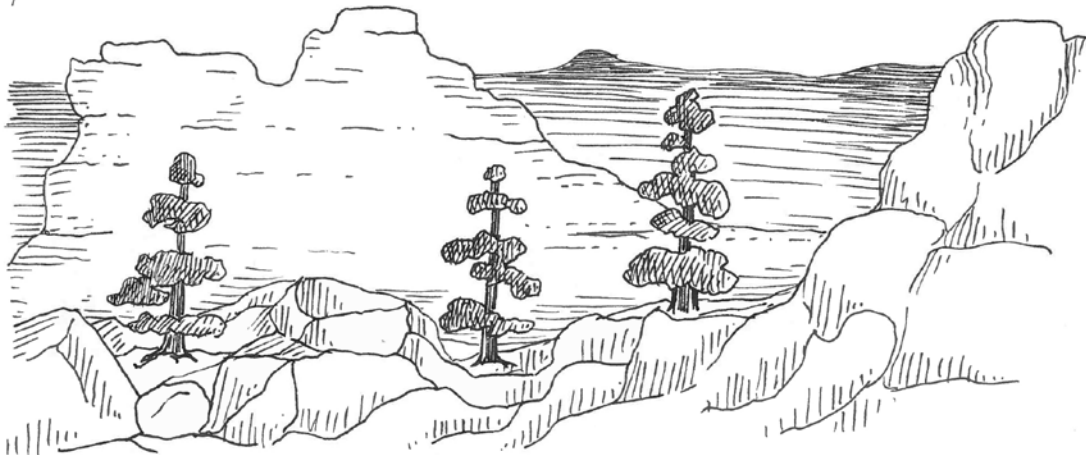
Plant Palooza

ACTIVITY: *Color the ecosystems and learn more about them!*

Piñon-Juniper Woodland: Many large animals live in this important ecosystem, like deer, elk, mountain lions, and black bears! Piñon pine is the New Mexico state tree and is famous for its tasty pine nuts. These areas need small, frequent fires to stay healthy so they can remain a good habitat for deer and elk.



Sandstone Cliff Landscape: Sandstone cliffs don't have many plants because growing on sandstone is tough! But there are a few trees, shrubs, and grasses that make their homes in the cracks or shelves along sandstone cliffs, including tall ponderosa pines.



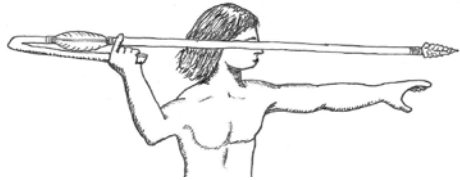
Grassland and Shrubland: Blue grama, galleta grass, and Indian ricegrass are just some of the grasses that grow at El Malpais. Grasses are important at El Malpais because they feed local wildlife and livestock, like cattle!



Lava Flow Landscape: Ponderosa pine, piñon pine, and juniper grow on lava flows. There is lots of water in the soil under the lava, which makes lava a great place for plants to live. Fire doesn't burn on lava flows very often so scientists believe some of these trees have lived here for almost 1300 years!



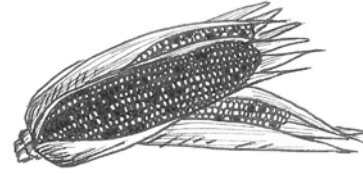
Who Lived Here?



Paleoamericans lived in El Malpais 10,000 years ago. They collected plants and hunted in kīpukas. Archaeologists have found projectile points (spear or dart tips) that were used by these people. Paleoamericans used *atlatls* for hunting local game, including deer, elk, and bighorn sheep.

Indigenous peoples

are closely tied with El Malpais. The Zuni, Acoma, Laguna, and Ramah Navajo people each have a distinct origin story for the lava flows at El Malpais. Historically, they used kīpukas as natural corrals to raise livestock, used the metate and mano to grind up corn and other crops, and recorded history in many ways, including petroglyphs. Locals still collect materials and celebrate on their traditional lands today.



metate and mano

~10,000 BC

~900 AD

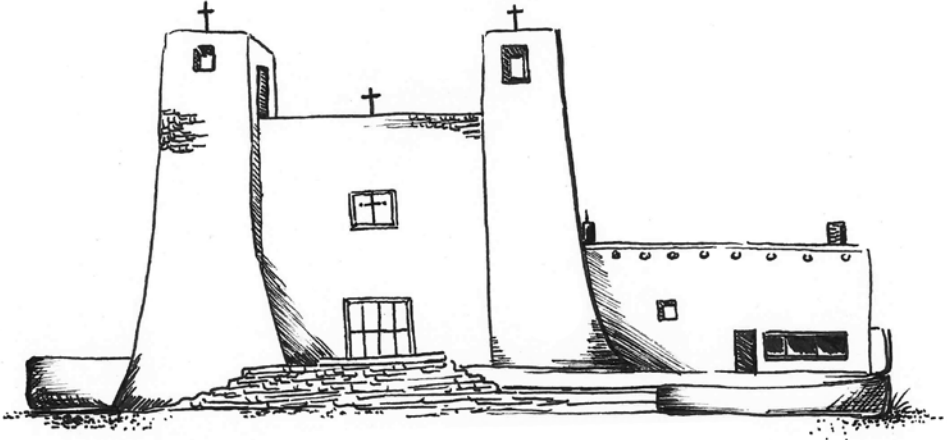
1550 AD



ACTIVITY: *These petroglyphs are in El Malpais! Petroglyphs are symbols or drawings carved or pecked into a rock face. One symbol may translate to a single object, or it may tell an entire story! Think about symbols that mean a lot to you or your family. Will future generations be able to understand your symbols? Draw some here!*

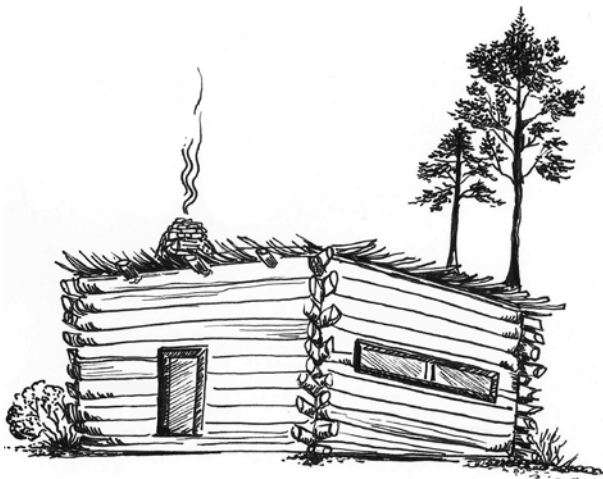


Spanish explorers came to El Malpais starting in the 16th century to explore new trade routes. The lava flows made it difficult for the explorers to travel and the area became known as “the badlands.” There was often conflict and war between indigenous peoples and the Spanish. The impacts of these cultures meeting can still be felt today. Hispanic families settled in the area and were some of the first people to begin homesteading in El Malpais.



1550 AD

1916 AD



The Schoolhouse in El Malpais that Christeen attended.

Homesteaders were given land to live on and farm in the early 1900s. They often lived in dugouts or small log cabins, grew plots of crops, and grazed livestock on their land. El Malpais is so dry that people had to haul water long distances for drinking and watering their crops. The Dust Bowl and the Great Depression caused many people to leave El Malpais by the mid 1940s. Growing up in El Malpais in the 1930s would have been very different from today. There are many records and photos from that time of a girl named Christeen Adams. She played with dolls, had a pet dog, and went to school just like you! Check out the BLM Ranger Station to learn more about how Christeen and other homesteaders lived.

Extraordinary Elements

Fire is very important in El Malpais. Small fires help to clear out excess wood, called fuel. These small fires help prevent larger, more harmful fires in the future. A prescribed burn is a small fire that is purposefully set and watched by firefighting crews.

Fire and water, like volcanoes and oceans, have shaped El Malpais for thousands of years. Today, these elements are important forces on the landscape and keep it healthy and thriving.

Before Fire



After Fire



ACTIVITY: Describe two of the differences you spot between the landscape pictures.

Water is scarce in El Malpais, so it's important when we get it! Water usually comes in the form of rain or snow. Tinajas, or little ponds in sandstone, fill with rainwater and make a special habitat for animals.

ACTIVITY: Write a haiku about water! Haikus are three-line poems with 5 syllables in the first line, 7 in the second line, and 5 in the last line.

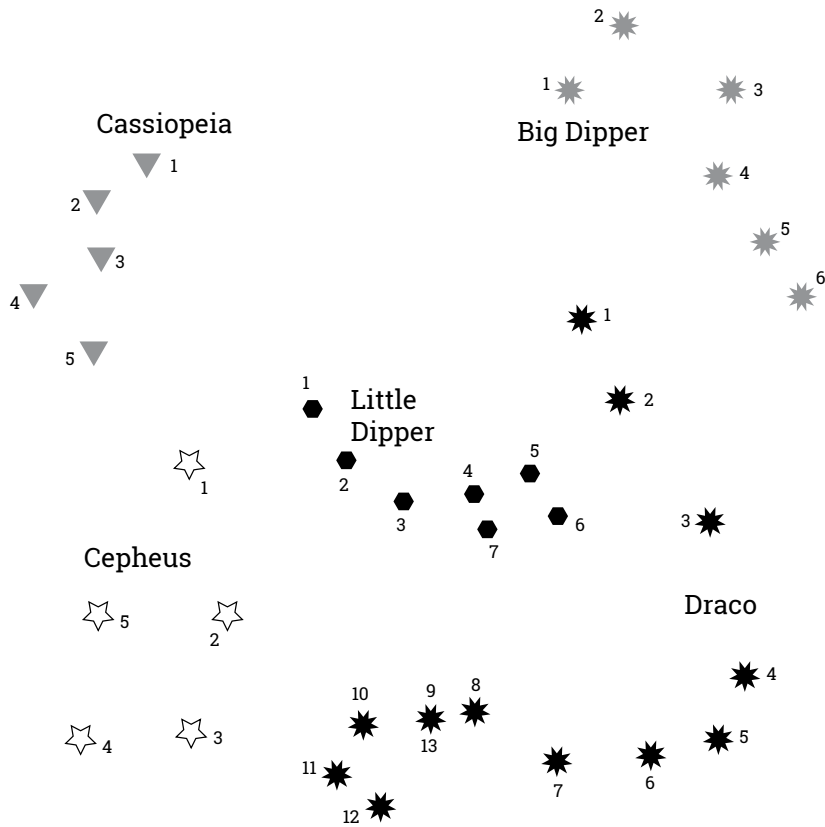
Example haikus:

Sandstone climbs with clouds
Lava stretches, black and rough
Blue sky floats above

A precious resource
Water comes in heavy rains
El Malpais blooms

Starry Skies, Starry Eyes

There are more stars than we can count in the entire universe and you can see so many of them at El Malpais! The Northern Hemisphere circumpolar constellations are visible in the sky all year long. They don't disappear with certain seasons like other constellations. Are you camping in El Malpais? If so, make sure to check out the night sky with an adult you know!



ACTIVITY: Connect the dots to find the five circumpolar constellations in the northern hemisphere.

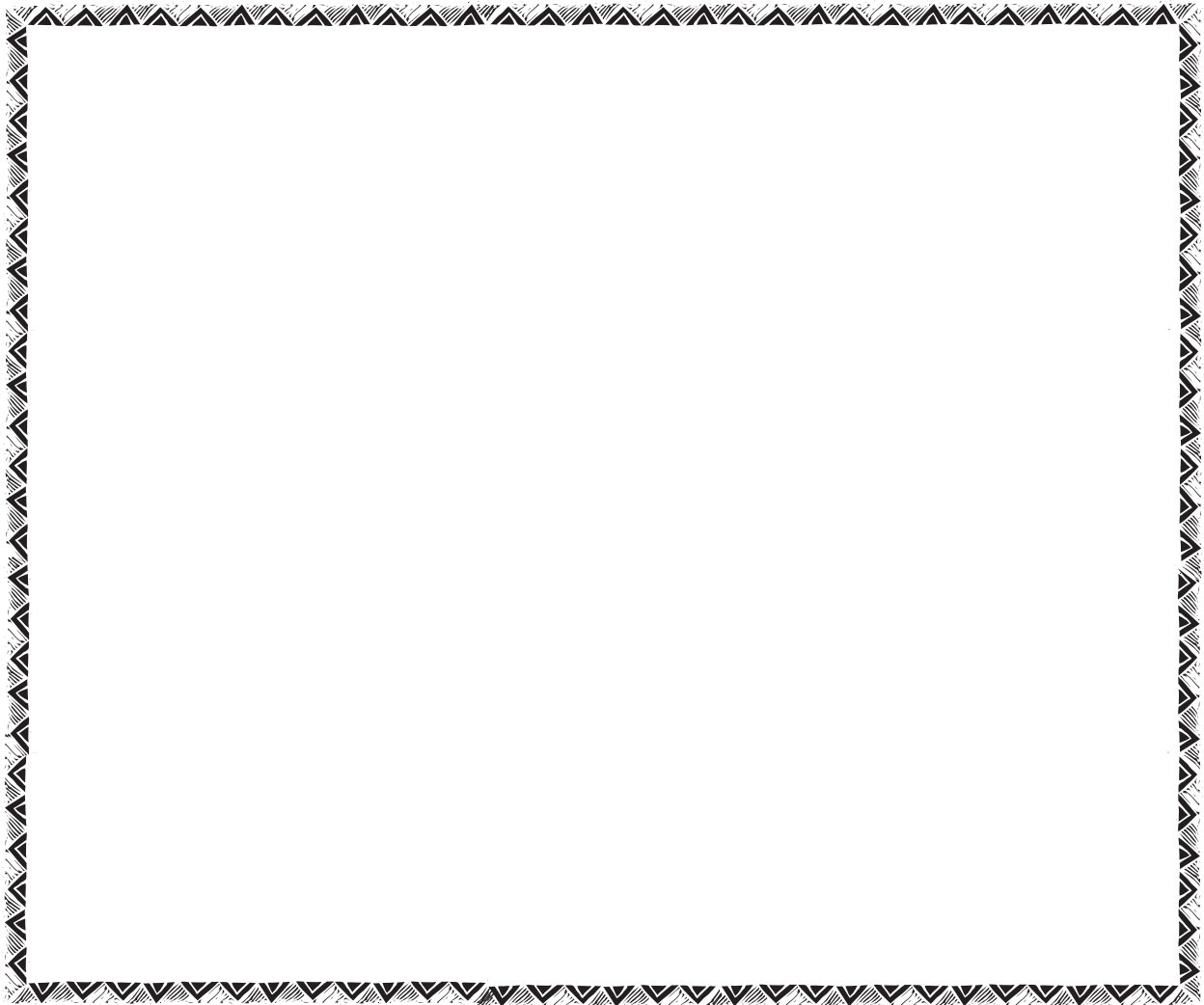
Night skies aren't always as dark as they should be. The lights we use can make stars very hard to see. This is called light pollution. We can reduce light pollution by using fewer lights and making sure that the lights we do need are pointed toward the ground!



Wild About Wilderness

Wilderness Areas are special natural places that are protected and set aside for visitors and research. Congress began designating Wilderness Areas in 1964. There are two in El Malpais: Cebolla Wilderness and West Malpais Wilderness! If you and your family want to learn more about Wilderness Areas, get in touch with your local BLM office.

ACTIVITY: *Draw a picture of you and your family, friends, or pets in your favorite wild place (even if it's not a Wilderness Area)! Cut out this picture and save it after you've finished your Junior Ranger booklet.*



Stewards of the wild

You can do many things to be a good steward. A steward is someone who takes care of wild places. Disposing of your garbage responsibly when you're outside is a great start! Enjoy a beautiful picnic in nature, but make sure to take all of your trash and food waste with you when you leave.

Did you know that it can take up to two years for fruit peels to decompose? This is especially true in the desert. Be sure to put your orange peels, apple cores or other fruits in the compost or garbage when you're done with your snack!

ACTIVITY: *Be a good sort! Sort the garbage by drawing a line between each item and the bin it belongs in. Look for recycling and trash bins around the NCA to be a good steward! We don't compost at the NCA right now, but you can start your own backyard compost to get rid of food waste and fertilize your garden.*



Leave No Trace



The Leave No Trace Seven Principles help children and adults learn how to protect the outdoors! By being a responsible steward when you go outside, you help protect the environment for plants, animals, and people. Read the principles below and visit lnt.org to learn more.

ACTIVITY: *Play a game of charades with your family or friends. Have each member of the group act out a principle and try to guess which one they are performing! Check off each principle as you guess them.*

- Know Before You Go:** Plan ahead and bring the right supplies.
- Choose the Right Path:** Stay on the trail and camp on established sites.
- Trash Your Trash:** Bring all of your trash out with you, including fruit peels.
- Leave What You Find:** Leave natural and archaeological items where you found them.
- Be Careful with Fire:** Only burn fire where it's allowed and put them out.
- Respect Wildlife:** Leave wildlife alone and watch it from a distance.
- Be Kind to Other Visitors:** Make sure to give other visitors the chance for a natural, peaceful experience!

Recreation Station

Solve the logic puzzle below to learn about the activities available in El Malpais.

ACTIVITY: *Cassie, Eddie, and Seymour are exploring El Malpais with their families. Use the clues provided to assign them each a camping location, an activity and a piece of gear! Everybody should only have one of each and each animal will have a unique combination. Don't make any assumptions and use the chart below to help you solve the problem! The information from the first clue has been filled in on the chart for you.*

Eddie camped on lava.

Cassie went hiking.

Seymour brought a backpack.

The animal that brought a flashlight camped on grasslands.

The animal that camped on piñon-juniper went stargazing.













The animal that brought water went caving.

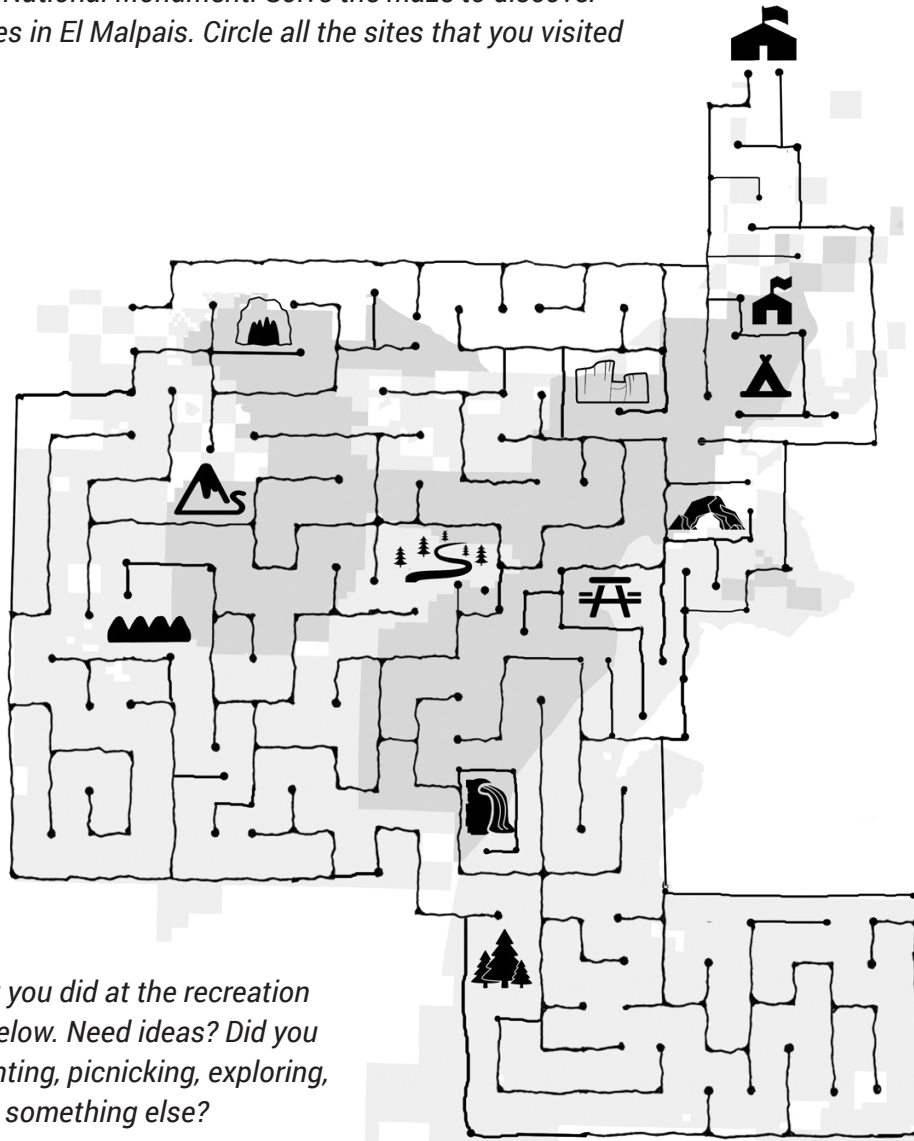
		Cassie Coyote	Eddie Eagle	Seymour Antelope
Camp Location	Lava	X	✓	X
	Grasslands		X	
	Piñon- Juniper		X	
Activity	Hiking			
	Caving			
	Stargazing			
Gear	Backpack			
	Water			
	Flashlight			



Map Maze

ACTIVITY: This maze matches the shape of El Malpais National Conservation Area and National Monument. Solve the maze to discover all of the recreation sites in El Malpais. Circle all the sites that you visited today on the maze.

-  Chain of Craters
-  Hole-in-the-Wall
-  Lava Falls Trail
-  BLM Ranger Station
-  Joe Skeen Campground
-  La Ventana Natural Arch
-  El Mapais Visitor Center (NPS)
-  Ice Caves
-  Big Tubes Area
-  Armijo Canyon
-  The Narrows Picnic Area
-  Sand Stone Bluffs



ACTIVITY: Write what you did at the recreation sites that you visited below. Need ideas? Did you go hiking, camping, hunting, picnicking, exploring, backpacking, caving or something else?

Junior Scientist

Most scientists keep a field notebook with pictures and words describing what they find! Be a scientist and use this page to draw or write about your outdoor El Malpais adventure.

ACTIVITY: Try to note something you discovered with each of these four senses: sight, smell, hearing, and touch.

DATE: _____

TEMPERATURE: _____

RESEARCHERS: _____

WEATHER:

 sunny	 cloudy	 stormy	 snowy	 windy
--	---	---	---	--

OBSERVATIONS: _____

Answer Key

Many of the activities in this booklet are open ended and don't appear on the Answer Key.

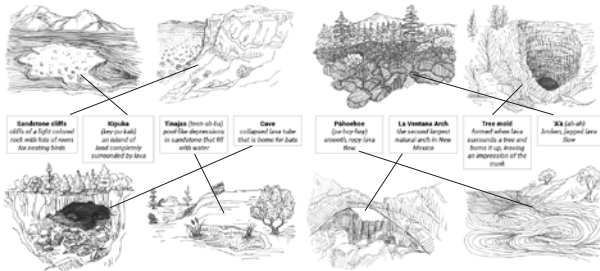
Page 2

Items that can be circled: bandana, binoculars, Book on Birds, camera, coat, compass, fire starter kit, first aid kit, GPS, hat, map, shoes, snacks, socks, sunglasses, sunscreen, water bottle

Page 3

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

Page 4 & 5

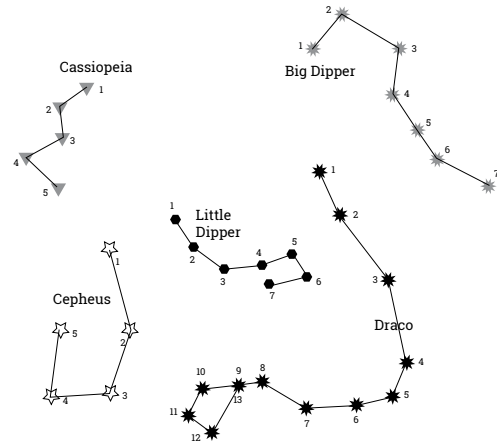


Page 6: Answers clockwise from top left: coprolite, shark tooth, bivalve, ripple marks

Page 14: Fire Activity

Answers will vary. Correct answers include: fewer trees after fire, higher crown to base height (or trunks that appear longer) after fire and more understory and grasses after fire.

Page 15



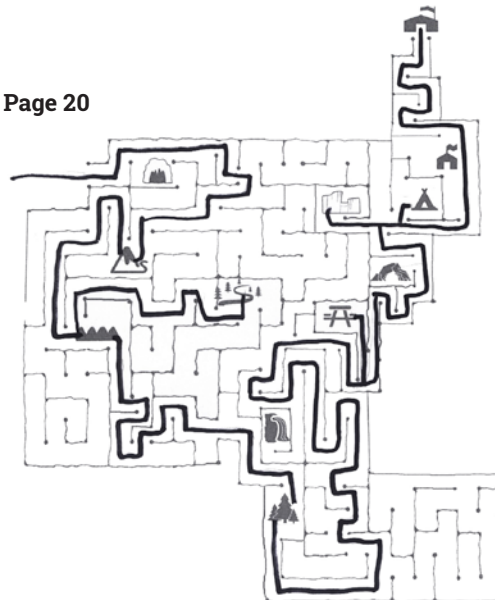
Page 17: Be a Good Sort

Recycle: soda can, water bottle, brochure. Trash: styrofoam cup, trash bag, straw. Compost: Banana peel, apple core.

Page 19: Logic Puzzle

- Cassie Coyote: Grasslands, Hiking, Flashlight
- Eddie Eagle: Lava, Caving, Water
- Seymour Antelope: Piñon-Juniper, Stargazing, Backpack

Page 20



Draw a picture!



This document certifies that

has completed the necessary activities to become a Bureau of Land Management Junior Ranger. Check your level below.

- Lava Rock Level** **Lava Tube Level** **Lava Flow Level**
6 activities 7 to 12 activities 12+ activities

Date

Junior Ranger Oath

As a Junior Ranger, I promise to:

Treat the earth and all living things with care and respect,
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 history,
Share what I have learned with others!

Ranger Signature

El Malpais National Conservation Area

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Bureau of Land Management
www.blm.gov/visit/el-malpais-nca

Public Lands Interpretive Association
www.publiclands.org

National Park Service
www.nps.gov/elma/index.htm

Leave No Trace
www.lnt.org

Continental Divide Trail Coalition
www.continentaldividetrail.org



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Rio Puerco Field Office - El Malpais Junior Ranger Guide