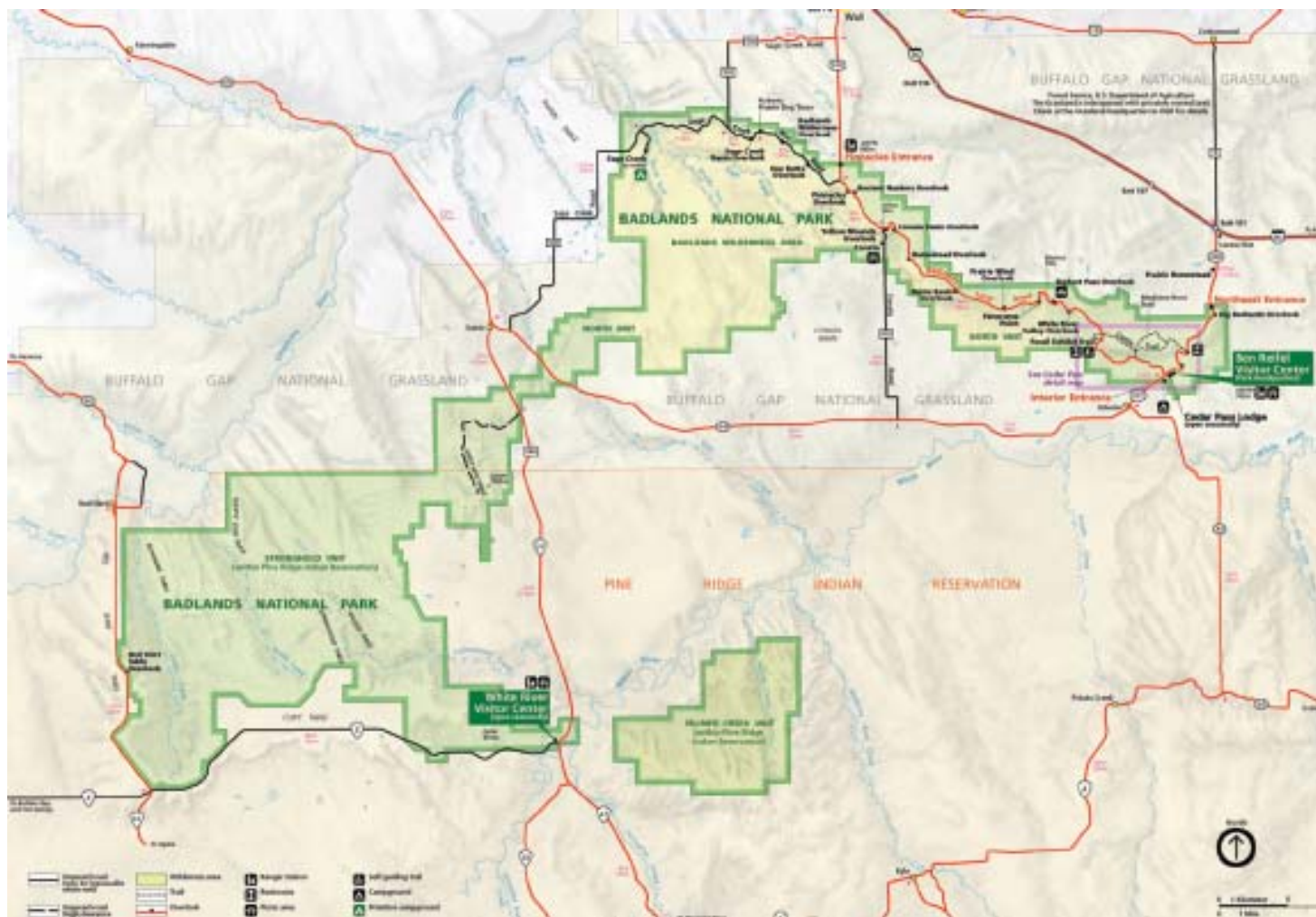




Pinnacles Post

The newspaper for visitors
ages 7 through 11
Second Issue



National Parks: Who We Are and What We Do

Are you interested in nature? What about history or science? Do you like to hike? How about visit museums? Bet you like to play in the sand at a beach? If you answered yes to any of these questions, there is a national park for you. The National Park Service (NPS) is the federal agency responsible for caring for these special places for all people.

Did you know that the NPS does more than manage areas called "national park"? It also oversees National Monuments, National Battlefields, National Historic Sites, National Seashores, and much more - a total of 388 units. They cover more than 84 million acres - everthing from the largest national park (13.2 million acre Wrangell-St. Elias National Park and Preserve in Alaska) to the smallest memorial (.02 acre Thaddeus Kosciuszko National Memorial in Philadelphia, Pennsylvania). The NPS protects habitat for 369 threatened or endangered species, 1.5 million archaeological sites, and 27,000 historic structures.

The NPS as an agency got its start on August 25, 1916, 44 years after the first national park - Yellowstone - was created in 1872. Today, the mission of the NPS states:

The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

What does that mean? Special places of natural, historic, or cultural significance are set aside and protected - for you!

Quick Facts About the Badlands

Designated a National Monument: **January 25, 1939**

Redesignated a National park: **November 10, 1978**

Total area: **242,756 acres**

Acreage of federally designated wilderness: **64,250 acres**

Number of visitors (2004): **937,684**

Number of employees (permanent): **74**

Number of employees (summer): **83**

Number of volunteers: **113**

Park budget (2005): **\$2.9 million**

Number of mammal species found in park: **57**

Number of bird species using Badlands habitat: **215**

Number of threatened or endangered plant or animal species found in park: **One**

Number of archaeological sites known: **283**

Number of plant species found in park: **460**

Number of structures maintained: **72**

Number of paleontological sites known: **750**

Number of museum specimens protected: **44,437**

Miles of roads and trails maintained: **62**

An Activity to Do

Look through the Pinnacles Post for the pink boxes. These indicate an experiment, game, or other activity for you to do to learn more about Badlands National Park. If you complete all of the activities in this newspaper and send your results to *Pinnacles Post Ranger; Badlands National Park; P.O. Box 6; Interior, South Dakota 57750*, you will receive a Junior Ranger badge by mail. Questions about an activity or have an idea? Email badl_interpretation@nps.gov for help

Learning More

Light green boxes in the Pinnacles Post are places you can look to find books and websites that will provide you with more information about a topic, such as fossils, history, geology, or wildlife. Check with your school or local librarian for assistance. You can also email a ranger at Badlands at badl_information@nps.gov Remember - parents are pretty helpful, too!

Virtually Visit Any National Park

Light blue boxes will steer you to the National Park system. Did you know that every state has at least one National Park Service area - well, except for Delaware. To learn more about the U.S. National Park System and all of its nearly 400 units, visit us whenever you like on the Internet at <http://www.nps.gov/> You can select your home state to find the national park nearest you!

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Badlands Geology Rocks!

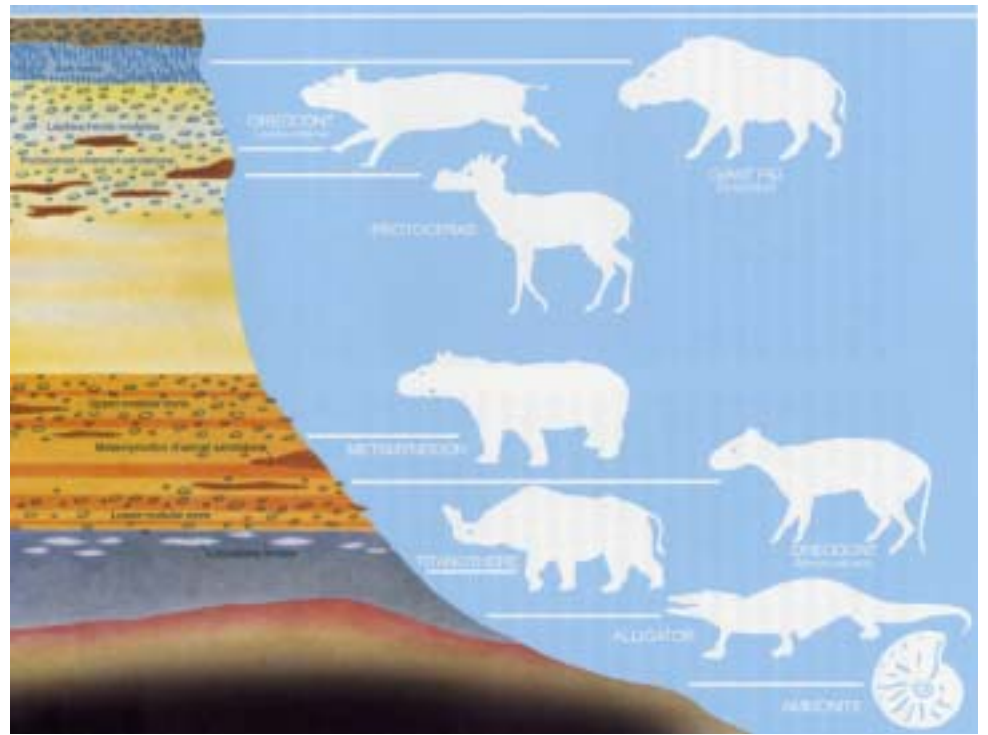
What are the Badlands?

If you call them mountains or volcanoes or hills, they might get offended, as they are not any of these things. The proper term for the formations found here is actually badlands, and this term applies to other formations of soft, erodible sediments. There are similar formations found throughout the United States and the world that carry this name—there are badlands in Canada, California, Arizona, Eastern Europe—and that's not all.

To those who have the chance to get up close to the White River Badlands, it may seem like these formations are made of something more like dirt than rock. This may seem especially so to hikers who have felt the ground give way under their feet, yet the layers are made up of rock—sedimentary rock. Sedimentary rock is formed when little itty bitty pieces of older rocks break off and are carried and dropped off somewhere new. There, they get compressed together under the weight of sediments above them, and then get glued together into rock by mineral cements in the spaces between particles. This is what happened in the Badlands—over millions of years, water in the form of ancient rivers and streams carried sediments from the Rockies and Black Hills and left them behind in a process called **deposition**. Think of it like making a deposit in a bank—you leave your money there just as water left sediments here.

We can see the deposits left behind as the horizontal layers in the formations. Think about this next time you make a sandwich: everything you put on it—the bread, mayo, lettuce, cheese, tomatoes, deli meat—represents one of those layers that water laid down in this corner of western South Dakota. Except the Badlands sandwich has so many layers you would never be able to get your mouth around it!

But how do we see these layers if they were all put down on top of each other? This is due to another important geologic process—**erosion**. Erosion is the opposite of deposition. Deposition builds land up, while erosion wears land down through the actions of water, wind, and ice. Think of taking a big bite of your sandwich—now the inside is exposed the way that the Badlands layers are exposed now from water carrying away the sediments around the formations. Every time it rains here, the rain carries more sediments away into surrounding rivers. This process started breaking down the rock layers only about a half million years ago, and geologists think that in another half million years, the Badlands formations we know today won't exist anymore. Better visit soon!



What Your Sandwich Tells Us

Just as how you make your sandwich might reflect something about you—that you don't like mustard or pickles, or that you prefer wheat over white bread—the layers of the Badlands sediments gives us information about the different landscapes. From looking at the types of sediments and the fossils found in the layers, **geologists** (those scientists who study rocks) and **paleontologists** (those scientists who study ancient life) work together to figure out the different kinds of environments, climates, plants and animals the White River Badlands once had.

The oldest layers in the park are at the bottom, like the first slice of bread you begin building upon. In these layers, fossilized sea animals and shells are found. What does that mean? There was once an ocean here! But we don't need scuba gear to explore the Badlands today, so this area must have gone through some major changes. In layers of rock deposited above this seabed, fossils of giant land mammals as well as alligators are found, indicating a warm, humid swamp environment. Layers of rock closer to the top of the Badlands formations give evidence of a grassland, an environment closer to that of the prairie found here today.

Science Fair Fun For You: Make Your Own Sandstone

Sandstone is a type of sedimentary rock, and it is one of the harder rocks of the badlands formations. Here is a recipe for you to make your own sandstone, but unlike in the badlands, you won't have to wait millions of years!

What you will need:

- One-half cup of water
- Two paper cups
- 2 and a half tablespoons of Epsom salts (sold at most drug stores)
- Spoon
- One-half cup of dry sand

What to do:

- Put 1-1/2 inches of water in the bottom of one of the paper cups.
- Dissolve the Epsom salts in the water. Keep stirring until almost all the salt has disappeared. The salt will cement the particles of sand together, just as certain minerals cement sand particles together in real sandstone.
- Put 1-1/4 inches of sand in the bottom of the other paper cup.
- Pour the salt mixture into the sand and stir until the sand is completely wet.
- Let the wet mixture sit undisturbed for about one hour. Then carefully pour off all the water that has risen to the top. You will have to pour off water several times during the first day of the experiment.
- Keep the paper cup uncovered in a place where no one will disturb it for at least one week.

When the sandstone has dried completely, tear the paper cup away from it. If the sides and bottom are still damp, let the sandstone sit undisturbed until it is completely dry. Then it will feel like real sandstone. **Taken From:** *Geology Crafts for Kids, 50 Nifty Projects to Explore the Marvels of Planet Earth* by Alan Anderson, Gwen Diehn, and Terry Krautwurst.



Similar But Still Special: Explore Some "Paleo-Parks"

These national park units have geology similar to Badlands National Park and are also rich in fossils. Check them out online.

Petrified Forest National Park	http://www.nps.gov/pefo/
John Day Fossil Beds National Monument	http://www.nps.gov/joda/
Death Valley National Park	http://www.nps.gov/deva/
Hagerman Fossil Beds National Monument	http://www.nps.gov/hafo/
Dinosaur National Monument	http://www.nps.gov/dino/
Fossil Butte National Monument	http://www.nps.gov/fobu/
Agate Fossil Beds National Monument	http://www.nps.gov/agfo/
Florissant Fossil Beds National Monument	http://www.nps.gov/flfo/

For More Information:

Online Resources

Badlands National Park website: <http://www.nps.gov/badl/exp/home.htm>
Geology of the National Parks: <http://www2.nature.nps.gov/geology/tour/>

Books

Smith, Bruce and David McKay. *Geology Projects for Young Scientists*

Blobbaum, Cindy. *Geology Rocks! 50 Hands On Activities to Explore the Earth*

Lawton, Rebecca, Diana Lawton, and Susan Panttaja. *Discover Nature in the Rocks: Things to Know and Things to Do.*

Fossil Fun

Calling All Future Paleontologists!

Yes, paleontologists are the scientists who dig up fossils (the evidence of past life). That is what paleontology is really all about—with the help of fossils, paleontologists try to piece together the way life on earth has changed over millions of years (though not human life—that’s the archeologist’s job).

So you say you want to be a paleontologist? What does it take? For one thing, it requires patience and a willingness to do some hard work. It’s not just about digging in the dirt—for every hour spent in the field, a paleontologist might spend as much as 27 hours in the lab. And you just don’t go into the dirt with shovels—fossils can be very fragile and hard to separate from the rock it has been sitting in for millions of years. That’s why a paleontologist’s tools might include dental picks, paintbrushes, and even a toothbrush.

How can you start your study of paleontology now? Use the resources in the blue and green boxes in this newspaper to get started. There are lots of summer camps, museum education programs, and volunteer projects where you might be able to actually participate in a dig. Just remember the most important thing: Leave fossils where you find them. Take pictures. Draw the fossils as you found them.



This paleontologist is carefully covering a fossil in plaster - just like a doctor might put a cast over a broken bone to protect it. This white cluster of fossilized bone called a jacket will be removed and taken to a lab for cleaning and study.

Where Are the Dinosaurs?

When people hear the Badlands has a lot of fossils, they often want to know if we have dinosaurs. Well, no. But don’t turn the page yet! We may not have dinosaurs, but we do have fossils of lots of unusual looking creatures that are not around today. The Badlands contains one of the greatest collections of mammal fossils in the world within its formations.

The reason we don’t have those dinos is that we were under water long ago - an inland sea, in fact. During the age when dinosaurs roamed the earth, the part of South Dakota where Badlands National Park is today was under the Western Interior Seaway, which covered much of the midwestern United States and Canada, all the way down to the Gulf of Mexico. The Badlands does have some fossils from this time period though—sea creatures like ammonites, baculites, and giant marine reptiles like the mosasaur.



RIGHT South Dakota was deep underwater during the time of the dinosaurs. The red star shows the location of Badlands National Park when dinosaurs roamed North America.

LEFT Mosasaur was a meat-eating marine reptile. It lived in the sea that covered Badlands. Some were more than 30 feet long!

An Activity for Future Paleontologists

Test your steady hand by trying this: Next time you have a chocolate chip cookie, take a toothpick or two and try to excavate (dig out) a chocolate chip without breaking it.



Fossil Match Up

Being a good paleontologist also requires a lot of knowledge. Paleontologists study geology to learn about the rocks where fossils are found. They also need to study biology to figure out how an ancient animal might have lived and how it might relate to animals we see today. Test your knowledge by playing the following game: match the picture of these extinct Badlands mammals to their descriptions.

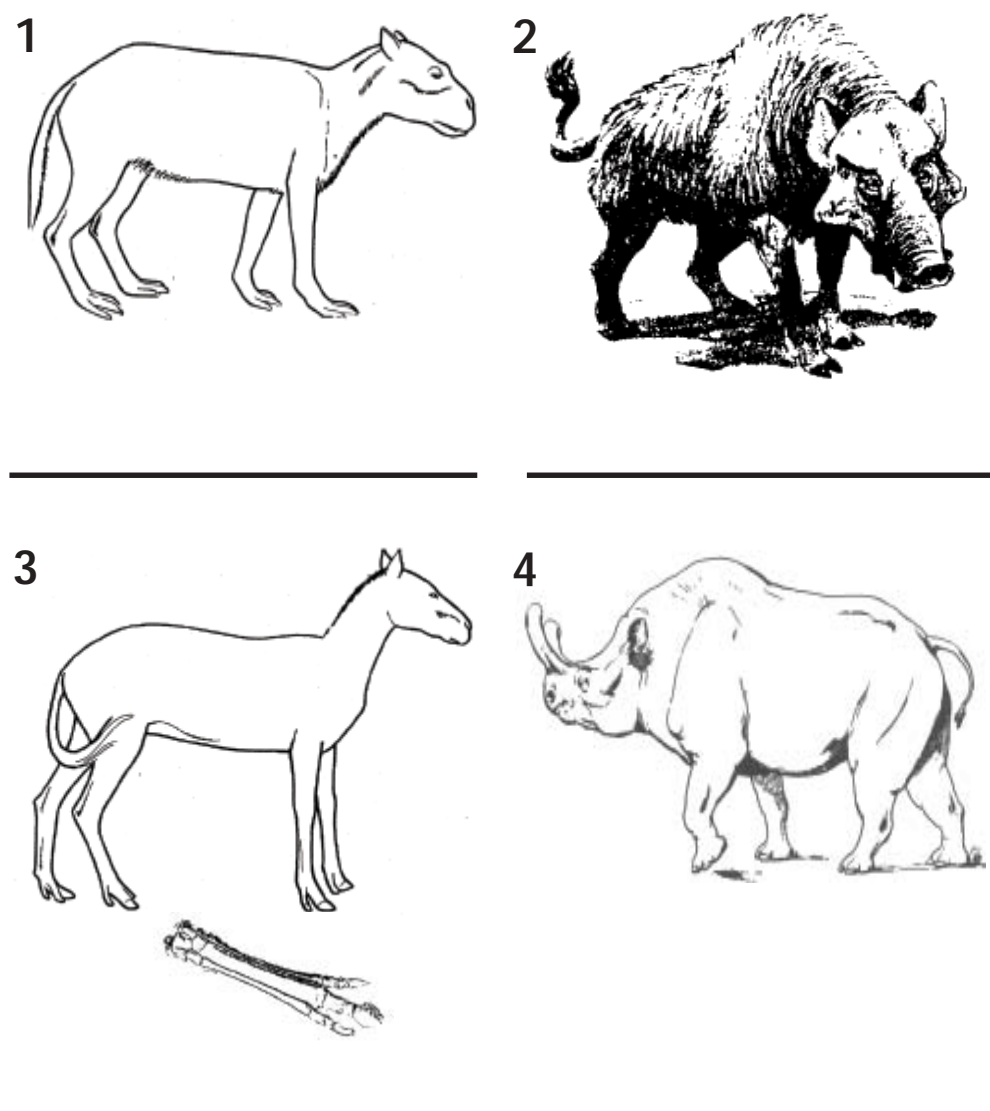
A. Plains Indians found fossils of the **Titanotherium** and called it “the thunder beast.” If you had been around to see one 35 million years ago, you might have thought that it looked quite beastly. From its fossils, we can tell it was the size of a small elephant and had a forked horn. Although they look like a rhinoceros, they are actually distantly related to the horse. Come up with your theory: Why does Titanotherium have these strange horns? (Your theory is as valuable as anyone else’s because no one knows why!)

B. The name **Oreodont** refers to a large family of sheep-like mammals. They probably lived in herds, had short legs, and ate grass. They are one of the most commonly found mammal fossils in the park, indicating that they were plentiful at one time, but they have no existing relatives today. Their name means “mountain tooth” because of the sharp ridges of teeth used to grind the tough grasses.

C. **Archeotherium** is nicknamed the “big pig” even though it is not actually related to our modern day pigs. Archeotherium eats anything so it’s called an omnivore, having both molars for eating plants and large incisors for eating meat. It was a scavenger, feeding on anything that came its way - the stinkier the dead animal, the better! Archeotherium stood five feet tall at the shoulder - now that’s a BIG pig.

D. **Meshippus** was an early horse, but it looked quite different from the horses you might be familiar with—it was about the size of a collie dog and had three toes! Horses got taller and lost their toes in order to run fast across the grassy plains and escape their predators. Horses are native to North America but went extinct about 10,000 years ago. They were reintroduced by the Spanish around 1540.

The animals to the right are not to “scale.” Remember that Titanotherium was very large while Meshippus was quite small. Archeotherium and Oreodont are in-between sized.



Answer Key: 1 = B, 2 = C, 3 = D, 4 = A

At Home on the Badlands

Wonderland National Park?

Why would someone name a National Park “Badlands?” It doesn’t sound like an inviting place to plan a vacation around. An early supporter of the park wanted to call it Wonderland, but the name Badlands stuck. This name came from French fur trappers who traveled through the area. They didn’t think it was very inviting either, with its extreme weather, tall peaks, lack of drinkable water, and rocks that would crumble underfoot. They called it *les mauvaises terres a traverser*, or “bad lands to travel across.”



Some people were so eager to see the Badlands they drove through before there were even any roads!

A Home on the Range

Do you like to get things that are free? Sure, lots of people do. That is why many people came out West to places like the Dakotas in the late 1800’s and early 1900’s—because the government was giving away land for free...but with the cost of hard work. The Homestead Act gave people the chance to get land for a small fee, but just as long as they cultivated and grew crops on part of their land. This proved to be quite difficult in some places, the Badlands area included.

Many people had to make do without the comforts of their homes back east or in Europe. Without many trees on the prairie, many homesteaders ended up building their houses out of sod—bricks of soil held together by grass roots. Many of these “soddies” were abandoned within just a few years as poor soil, little water, harsh winters, and dry summers forced many homesteaders to pack up and leave. A few hardy homesteaders remained, but now much of South Dakota is covered not in farms, but grazing land for cattle.

To learn more about homesteading, virtually visit Homestead National Monument of America in Nebraska at <http://www.nps.gov/home>

Stake your claim in the Badlands by becoming a Junior Ranger. Complete the activities in this newspaper, send your results to Pinnacles Post Ranger; Badlands National Park; P.O. Box 6; Interior, South Dakota 57750 You’ll receive a “Stake” in Badlands National Park and your Junior Ranger badge within 2 weeks of receipt at the park.



This “little house on the prairie” was home to a family of six. Did you know that the real Little House on the Prairie from Laura Ingalls Wilder’s books is in DeSmet, South Dakota?

The Oglala Lakota of the Badlands

What do you think of when you hear the words “Indian” or “Native American”? **American Indian** is a general name for the many different nations of people who lived in North America before Europeans came to the continent. American Indians lived across North America from the Cayugas in New York to the Denai’ai People in Alaska. These nations each had their own language and traditions. Just as each European nation is different, so are the native nations of North America.

One of the most well known groups of Native American people are the Sioux, pronounced “Sue”. The Great Sioux Nation once included the states of South Dakota, North Dakota, Minnesota, and Wyoming. This large nation was divided into three language groups: The Nakota (located in Minnesota), the Dakota (western Minnesota and eastern South Dakota), and the Lakota (western South Dakota and eastern Wyoming).

The Lakota are most closely associated with the Badlands of South Dakota. The Lakota have seven council fires, each of which is known today as a “band” of the Lakota. The Oglala band make their home on Pine Ridge Reservation, the second largest Indian Reservation in the United States today.

The traditional Lakota dress included feathers, leather, and beadwork. Historically, their homes were tipis; however, today the Lakota live just like everyone else - in houses, trailers, or apartments in a land they love. The Lakota of the 21st century are working to preserve their culture and language by including the following classes in their schools: Lakota language, traditional dance, arts and crafts, and drum-making. Imagine that instead of learning ballet, you study fancy dance. Rather than practicing on a snare drum, you make your own hide drum and play in a drumming circle. Like so many things - the same but oh so different.

Other National Parks with Lakota Heritage

Agate Fossil Beds National Monument <http://www.nps.gov/agfo>
Little Bighorn National Battlefield <http://www.nps.gov/libi>
Wind Cave National Park <http://www.nps.gov/wica>

Badlands Mythology: A Paradise Lost

Before French fur trappers traveled through and homesteaders settled down, the Badlands was not an empty landscape. Different American Indian tribes lived and wandered through the area, following the bison that their lives were so connected to for food, shelter, and spirituality. Part of Badlands National Park is actually on the Oglala Lakota Nation’s Pine Ridge Reservation. The Lakota called the Badlands *Paha ska* or “white hills” and have their own explanation of how the Badlands landscape was formed.

There was a time when the land that is now the Badlands was a high plain covered in the greenest and richest of grasses and the animal people lived there in great numbers. The Great Spirit that had created this land decreed that all quarrels with another must be forgotten when any tribes were camped upon this plain.

For many years, many bands came together here, and though they might be unfriendly at other times, here they danced and sang and traded in peace. But then, from the western mountains came the people without meat or skins and with the look of a hungry wolf in their eyes. They wanted this place for their own and were not willing to share, so they at once set about driving off all the other tribes until there were no others on the plain.

A council was called to ask for help from the Great Spirit. But if He heard, He gave no sign. The people from the mountains grew fiercer and were not content to stay on the plain anymore. Now they went about the country seizing all villages that stood in their path.

The sky became cloudy from smoke signals sent as the tribes began to call upon others long distances away to help carry out an attack upon these mountain people. Warriors began to make ready for the great battle, and fighting men began to gather from every corner of the land. At last all were assembled and the day had come for the advance. Now the Great Spirit took matters into His own hands. Dark clouds hid the sun from the face of the world. Lightning streaked across the blackness and thunder rumbled high over the hills. From the ground flamed forth fire, and the earth shuddered and rocked. A wide gulf opened and into it sank the mountain tribe—all their people and all they possessed. With them sank all life—the waving grass and clear springs and animals. As suddenly as it came the storm ceased. The earth became fixed in waves as it had rolled and shaken. There was only a barren waste on which nothing has ever grown or can grow. The Great Spirit had take away the lands that had cause warring among His children and left to those He spared the evidence of His power and His punishment.

Taken from *Indian Legends of American Scenes*. Marion E. Gridley. 1939. M.A. Donohue & Company. Chicago.



Oglala Lakota dancers in the White River Badlands of South Dakota. Dance, music, food, and conversation are featured at social events called *pow wows*. Everyone is welcome to attend!

Pow wows are held across the country by different cultures. See if you can find one near you.

Welcome to the Prairie

Great American Desert?

Upon traveling through the prairies of the United States, early explorer Major Stephen H. Long referred to the area as the “Great American Desert.” He might have called the prairie this because of the lack of water and trees that people were used to in the Eastern U.S. Yet the prairie is not a desert—that’s the wrong biome! A **biome** covers a large geographic area and contains a community of specific plants and animals specially adapted to living in a certain environment and climate. Grasslands and deserts are two distinct biomes. Plus, the prairie is far from being deserted—it’s full of life. The grasses and wildflowers of the prairie are quite diverse (there are over 60 different types of grasses found in the park!), and provide food for a diverse set of animals—from grasshoppers to prairie dogs to bison. To stand in the middle of a field and see the grass waving, greeting you, is to know that it is alive.

Badlands National Park protects one of the largest expanses of mixed grass prairie in the United States. The mixed-grass prairie contains both short and tall grasses, acting as the transitional zone between the tall grass prairie to the east and short grass prairie the west. The amount of rainfall is what determines how tall or short the grass will be, with more precipitation allowing for taller grasses found in the eastern Midwest. Unfortunately, not much native prairie land is left—there is only about 2% of native prairie remaining in the U.S. That is why Badlands National Park puts a lot of work into restoring and protecting native plants and animals to the prairie.



Cottonwood trees are the most common of the the very uncommon trees in Badlands National Park.

Meet A Tree: An Interview with a Cottonwood

Park Ranger: So I guess by now you’ve heard the joke we tell around these parts, about how there are so few trees that we know every tree out here by name.

Cottonwood: (*sigh*) Yes, I’ve heard that—you know, it’s really not all that funny. Though come to think of it, you could start calling me by my scientific name, *Populus deltoides*.

PR: Alright *Populus deltoides*, so why is it that there are not many trees out here?

CW: It’s hard work to live out here! Some people don’t appreciate that fact; they just complain about the lack of trees. But this isn’t supposed to be a forest—this is a grassland, called such because the environment is best suited for grass. Why, you ask? First of all, there’s not a lot of water here. Trees are a lot bigger than grasses and require a lot of water to survive, more than the average 16 inches of rain and snow per year that we get in the Badlands. And then there’s the fire. Grass does just fine after fire, shooting up from the roots safely hidden in the ground, but fire can kill off trees. The prairie is especially hard on younger trees, because even if they manage to survive drought and fire, there is still the threat of being eaten by grazing animals like bison and deer.

PR: Wow, that sounds like a tough life! How are you able to make it out here?

CW: Well, we are one of only a few tree species out here because we have the right adaptations. Our leaves are thick and waxy so we don’t lose as much water to evaporation on hot days. And while we really don’t like to do this, we have the ability to drop some branches so we don’t have to supply them with water anymore. We also disperse our seeds by wind, which is what a lot of grasses do. Wind is something that we can always seem to count on here. Plains cottonwoods like me also have the distinction of being the fastest growing trees in the U.S.

PR: Your extraordinary ability to survive here has got me thinking...you know where we could use more of you? The campground and picnic areas. Why don’t more of you grow over there?

CW: We just don’t grow any old place! We tend to be found near rivers, washes, and roadsides, where there is a little more water available to us. Looking out at a distance on the prairie, you can often spot where the rivers are by looking for a green belt of trees that are growing along the banks. And the problem with the picnic areas is that whenever people see trees, they want to sit under us, or move picnic tables under us, and that actually hurts us. Moving around or sitting on the ground above our roots compacts the soil and makes it harder for water to reach our roots. This can be deadly for us...there are actually less trees in the campground than there used to be.



Science Fair Fun

Question: *How does grass survive animal grazing?*

The grasses that make up much of the prairie are amazingly tough survivors. They continue to live and grow after being munched on by herds of bison, burned by prairie fires, or even being mowed in your lawn. How do they do this? Try this experiment and watch how grass grows.

Materials:

Potting soil	7 ounce paper cup	Pencil
Trowel (small, hand-held gardening shovel)		Saucer
Clump of grass	Tap water	Marking pen
		Ruler

Procedure:

1. Put soil in cup.
2. Use the trowel to dig up a clump of grass that will fit in the paper cup (make sure you have permission first!). Find a clump that has at least three stems, and try to get as many as the grass roots as possible.
3. Plant the grass in the soil.
4. Use the pencil to punch three or four holes on the side of the cup around the bottom edge.
5. Set the cup in a saucer.
- 6/ Water the soil, keeping it moist, but not wet during the experiment.
7. Locate the nodes of the grass stems, where the leaves grow from a stem.
8. Use the ruler and pen to mark three equal sections on one of the stems between two nodes at the top of the stem.
9. Repeat step 8 for the other two stems, but marking the second and third highest pair of nodes, respectively.
10. Set the plant in an area where it will receive sunlight all or most of the day.
11. At the end of seven days, measure the distance between the stems.

What happened? Where does grass grow from? From the tips, or from the nodes? So what happens when a bison comes along and takes the top off a blade of grass? Do the lower portions of the stem continue to grow?

Taken from *Ecology for Every Kid, Easy Activities That Make Learning Science Fun*. Janice VanCleave. 1996. John Wiley & Sons, Inc. New York.

Prairie Places

Tallgrass Prairie National Preserve	http://www.nps.gov/tapr
Bent’s Old Fort National Historic Site	http://www.nps.gov/beol
Theodore Roosevelt National Park	http://www.nps.gov/thro
Homestead National Monument of America	http://www.nps.gov/home
Wind Cave National Park	http://www.nps.gov/wica
Buffalo Gap National Grassland	http://www.fs.fed.us/r2/nebraska/units/frrd/bgng.html

PR: How do you feel about people bringing in trees that are not originally from the prairie?

CW: Well, those often don’t survive, which just serves them right. The don’t have the right adaptations. Sometimes people get trees to survive by constantly watering them, but I feel that’s a waste of precious water in this semi-arid land. Why should they get help? I take pride in my self-reliance. Though other plants people bring in may just happen to take to life on the prairie, which can be bad news for us native species. Exotic species often have no predators and can take over an area, leaving no room for native species to grow.

PR: Well, thank you very much for talking with me and sharing what it’s like to live out here on the prairie. It’s not everyday that one gets to have a conversation with a tree.

CW: Anytime, I appreciate the chance to share my story about life on the prairie.

Wild Wildlife: An Animal Neighborhood



Black-tailed prairie dog (*Cynomys ludovicianus*)

First of all, I would like to say hello on behalf of the Badlands community of animals. But you know, there's one thing I don't understand about you humans—why do you call us **prairie dogs**? Yes, we bark, but we're not dogs; we are in the rodent family. Our barking is what allows us to communicate with the rest of our town to warn of predators like coyotes and hawks. And while a lot of people think we are pretty cute (which is actually rather flattering), I'd also like to point out that we are also quite important to the prairie environment. Many animals hang around our towns because they like the way we keep the grass short or they move into our abandoned holes.



American Bison, or "buffalo" (*Bison bison*)

Hey, she's talking about me! My name is **Bison** - but you can also call me *Buffalo*. It means the same thing to me. I'm one of those animals that like the prairie dog towns. The towns are a good place to find tasty and nutritious young grass shoots growing because the prairie dogs keep clipping the grass. Also, on a hot, 110 degrees F day full of swarming insects, there's nothing better than dirt bath on a dusty prairie dog burrow to cool me off and sooth my itch. Our prairie dog friends put up with us because this wallowing helps them keep the vegetation low so they can watch out for predators. There are almost a 1,000 of us bison roaming the Sage Creek Wilderness Area of Badlands National Park, but you have to remember that at one time there might have been as 60 million of us roaming North America.



Black-footed ferret (*Mustela nigripes*)

I was brought back into Badlands National Park in 1994, and I love it here! There are so many prairie dogs here—they make up about 90% of my diet, and they also dig the burrows that become my home. If you've never heard of us, it might be because we are one of the most endangered mammals living in North America. In the 1980's there were only 18 known **black-footed ferrets** still alive in the wild. Now there are around 200 of us living in the Badlands and on the surrounding Buffalo Gap National Grasslands.



Pronghorn (*Antilocapra americana*)

Greetings to you! I'm a **pronghorn** and a true American native. Don't tell Bison I told you this (because he likes to think of himself as the symbol of the American plains), but like many animals we associate with North America today—elk, horses, deer—bison are not truly native to this continent. They traveled to North America from Eurasia. As for us pronghorns, we actually evolved here in North America. Plus, we're found nowhere else in the world and are the last of our family, which is over 20 million years old. We're known for being speedy—I myself have been clocked at 70 mph. We're also unique because we're the only horned mammal that sheds our horns every year.



Turkey vulture (*Cathartes aura*)

Even though I'm a **turkey vulture**, some visitors mistake us for eagles because of our dark color and large wingspan, so I'd like to inform you so that you don't make the same mistake if we ever happen to meet. First of all, with binoculars, you could probably spot our bald, red heads. Also look for our wings of two different dark colors that we hold in a slight V shape, as opposed to the eagle's solid-colored and straight wings. Another difference is that we are a social bunch and can be seen soaring in large flocks around the Badlands peaks, but eagles are pretty solitary and won't fly in large groups like us. We especially get a great kick out of circling around tired hikers on hot, dry summer days. And the summer is when you will see us in the Badlands—we actually migrate into the southern U.S. for the winter.



Prairie rattlesnake (*Crotalus viridis viridis*)

Ssssssoooooo, hello! A lot of people are afraid of me, but I'll let you in on a little secret—I'm terrified of people! You're all so tall and you make the ground vibrate as you approach! We **prairie rattlesnakes** are the least aggressive of all rattlers, and I prefer to stay hidden under rocks during the hot Badlands summers. I don't like to be approached, so if I hear something coming I'll shake my rattle to give you fair warning, but if you keep coming closer, don't be surprised if I strike to protect myself!

An Activity: Get in Touch with Your Wild Side

Discover the wildlife around your own home. Here's a couple tips to help:

Bird Calling

Some small birds can be attracted by using this simple sound: pssh. Try using different rhythms that last about three seconds, like *pssh.....pssh.....pssh-pssh.....pssh.....pssh*. Try doing this in an area where birds are nearby, and hide motionless by trees or shrubs. This sound mimics several birds' scolding calls, and it might provoke their curiosity.

Love bugs? Here's some ways to attract and study them:

Pitfall trap

Find a place where you know lots of ground-scurrying insects like ants and beetles will be. Make sure you have permission to dig a hole, and then bury a mayonnaise-sized jar up to its neck. Set four stones around the jar opening and then set a piece of wood over the stones to cover the jar and protect it from rain and insect-loving animals. Try to keep the piece of wood about an inch above the ground. Experiment with putting different types of bait in the bottom of the jar—meat, cheese, overripe fruit and veggies and see if you get different types of visitors. Check the trap frequently so your friends don't die, and make sure you look into your jar before you scoop your captive out. After you have examined or even identified the insects using an field guide, set them free to live another day (or at least feed a hungry bird).

Nightwatchers

At night, stretch an old, light-colored sheet from a tree limb to the ground. Tie the sheet corners at the top to the limb with string (ask a tall person for help). Then tie the bottom sheet corners with string to stakes or heavy objects like a brick. Shine a flashlight behind the sheet and use a cup to collect the insects.

For More Information:

Roberts, Allene. *The Curiosity Club Kid's Nature Activity Book*. 1992. John Wiley & Sons, Inc. New York. (The above activities were taken from this book)

Cornell, Joseph. *Sharing Nature with Children*. 1998. DAWN Publications. Nevada City.

Websites

Black-footed Ferret Conservation	www.blackfootedferret.org
Black-tailed Prairie Dog Conservation	www.wildlifemanagementinstitute.org
Prairie Wildlife Conservation	www.conservenature.org
Pronghorn Background	www.antelope.org
Turkey Vulture Society	www.vulturesociety.homestead.com
Prairie Rattlesnakes	www.sdgifp.info/Wildlife/Snakes/PrairieRattlesnake.htm

Share Your Results!

The Badlands park rangers would love to know what wildlife can be seen in your area. Don't fret if you live in a city, because there is urban nature to be found - look up in the sky for birds or down in schoolyard and park grounds for bugs. Remember to use the tips on this page and those on page 7 for help in sighting wildlife. Encourage friends or parents to join you in this wildlife survey—nature is to be enjoyed and shared with others!

1. Use a field guide (or a knowledgeable friend or adult) to identify one species of bird that lives around your home: _____

2. Use a book or your own observations to discover an interesting fact about this bird:

3. Go looking for insects and arachnids (spiders and their eight-legged relatives), and draw a picture of one that you think is really cool. A magnifying glass could be a helpful tool, as long as your chosen critter doesn't run away too quickly!

4. Can you identify it? _____

5. Sit in your backyard or a park for five minutes with your eyes closed. Listen for sounds. Describe what you hear or what the sounds remind you of.

6. What other animals make their homes near you? If you don't see that many around, go for a walk and be observant—do you see signs of animals (dog tracks, bird nests, spider webs, rabbit holes)? List some of your animal neighbors or their signs.

Of Land and Sky



Can You Weather the Badlands Weather?

Human history, geology, wildlife, prairie. As different as these subjects might seem, they are all affected by something in common—the weather. The weather of a certain place determines what types of plants grow, what kind of animals can survive, what the landscape will look like, and can even dictate how people have to live.

The Badlands experiences hot, dry summers with temperatures exceeding 100 degrees F. Winters are typically very cold with lows reaching -40F and 12 to 24 inches of total snow-fall. Extremely high winds are common year-round, and can bring violent thunderstorms in the summer or sudden blizzards in the winter.

With these dramatic changes, it can be a challenge to call the Badlands home. Animals have to be adapted to both hot and cold temperatures like the bison, who grow a winter coat and then shed it during the spring. People are affected by climate also. The majority of homesteaders were driven away in the 1930's when drought conditions, poor farming practices, and the infamous prairie wind created the Dust Bowl, severe dust storms that ruined much of the land on the Great Plains. Many homesteaders who remained found trying to grow crops in this arid land was not as easy as they had thought, and the crop fields turned into grazing pastures for cattle. Yet ranching remains an uncertain business even today with the region's cyclical droughts.

"Hey, on page 3, you said the Badlands was carved mostly by water erosion caused by rain. Doesn't that mean there should be more rain?" Well, one reason that the Badlands has its famous formations is due to the nature of its rainfall. If there was a lot of rain here, the formations would erode away more quickly—maybe they would be gone already! Plus, the rain that does fall around here often come in sudden, heavy downpours that carry away sediments as it runs down numerous gullies into once dry washes.

Badlands is often referred to as a place of extremes. There have been blizzards in April, and a high of 62 in December; it could be sunny at noon, and then a thunderstorm appears an hour later. This type of change reminds us that when it comes to trying to predict weather in the Badlands, sometimes all you can say is that you have to be prepared to expect the unexpected.



The Delight of the Night

Another resource that makes the Badlands pretty special is its lack of light pollution. Light pollution? Are people littering light bulbs? Well, not exactly—it's a different type of pollution.

Have you ever tried to look up at the stars at night, only to find that they are hard to see because of all the lights in your town? Then you have experienced light pollution—it is excess light from humans that impairs our visibility at night or causes other annoyances, like a bright neon light shining into your bedroom window when you want to sleep. There are many areas in the Badlands where one can escape artificial light and see so many more stars than we are accustomed to from living in towns. The Milky Way is also highly visible in the Badlands, allowing visitors an opportunity to stand and gaze at very our own galaxy.

But there are also other reasons to go out exploring at night. Besides the chance to observe the night sky, being out in the dark also gives one the opportunity to perhaps see or hear some animals you would not normally see during the day. Why not? Because many animals are **nocturnal**, which means they only come out at night. In the Badlands, many animals are nocturnal so they don't have to be out in the hot summer sun, which would cause the animal to lose more water from its body, not a good idea in an area that doesn't have a lot of water to drink. So stay a night in the Badlands, and not only will you be treated to a canvas of stars, but perhaps an orchestra of coyote howls, owl hooting, and cricket chirps to accompany it.

What Is Wilderness?

Wilderness is a necessity ... They will see what I meant in time. There must be places for human beings to satisfy their souls. Food and drink is not all. There is the spiritual.

John Muir

What picture comes to your mind when you hear the word "wilderness?" Snow-capped mountains? An exciting jungle to explore? Scary unknown territory? Forests of gigantic trees? What about grass? "No way," you might say, "my lawn has grass!" Yet Badlands National Park has 64,250 acres of designated wilderness protecting the mixed-grass prairie.

What makes a land "wild"? According to the Wilderness Act of 1964, it is "an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain." The Wilderness Act created the National Wilderness Preservation System, which allows roadless areas of 5,000 acres or more to be designated as wilderness. This designation means that vehicles are not allowed, permanent camps or structures cannot be made, and wildlife and its habitat are to be kept in as primitive a condition as possible. Over 100 million acres have been included in the National Wilderness Preservation System so far, but that is only about 4% of the land in the United States, including Alaska, which contains 2% of those designated wilderness lands.

It was in 1976 that the Badlands Wilderness Area was established and now protects the largest prairie wilderness in the U.S. Today, it is the part of the park where bison still roam, the location of one of the most successful reintroduction sites for the endangered black-footed ferrets, and a place where you can walk for miles without encountering another person. Wilderness, wouldn't you say?

So why protect wilderness? Well, in the words of renowned Western writer Wallace Stegner, "We simply need that wild country available to us, even if we never do more than drive to its edge and look in. For it can be a means of reassuring ourselves of our sanity as creatures, a part of the geography of hope."



Badlands National Park has over 64,000 acres of wilderness - a mixture of prairie and pinnacles - an area that is also home to our bison, black-footed ferrets, and the remnants of homesteads from the early 20th century.

A Night Time Activity: *Here's Looking at You*

Looking for nocturnal animals is not always easy. Scientists at Badlands National Park look for the black-footed ferrets they study by shining a light into the dark and looking for a green eyeshine. The ferrets' eyeshine is caused by a membrane of reflective cells in the eyes of many nocturnal animals. This membrane reflects incoming light out of the eye in the same direction from which it came, allowing you to see their glowing eyes.

You can take a cue from these scientists and go looking for the eyeshine of nocturnal animals by placing the base of a flashlight against your upper lip or forehead and scanning an area with the beam. Tiny white specks in the grass of your backyard may be a wolf spider, while several pairs of greenish-white eyes could be a herd of deer. The color of the eyeshine can be a clue to the animal's identity. Here's a guide to some common animal eyeshine colors:

Animal	Eyeshine Color
Raccoon	Bright Yellow
Opossum	Dull Orange
Skunk	Amber
Porcupine	Deep Red
Fox	Bright White
White-tailed Deer	Greenish-White
Woodcock	Glowing Red Dots
Flying Squirrel	Reddish-Orange

Taken from Talking to *Fireflies, Shrinking the Moon, Nature Activities for All Ages*. Edward Duensing. 1997. Fulcrum Publishing. Golden, Colorado.

How To Visit Badlands National Park



Badlands National Park is located in southwestern South Dakota, easily accessible from Interstate 90 that runs east-west across the state. Two entrances are located just off the Interstate while one is near Highway 44. The remodelled Ben Reifel Visitor Center reopened in 2006 and is located near the small town of Interior, South Dakota. At the Visitor Center, you'll find interactive exhibits, a 20 minute film called *Land of Stone and Light*, a bookstore, and a ranger on duty to talk to you.

When in the Badlands, you can explore the trails or the formations, go on a summer ranger program to learn more about Badlands' natural and cultural history, and cruise a scenic drive that will take you through the amazing features of the park. Information on what to do in the park can be found in the park activity guide - *The Prairie Preamble* - available at entrance stations, visitor centers, and online at www.nps.gov/badl/

About that website - remember to use it to plan your visit in advance or use it any time to virtually visit this national park. Explore deeply into our website for activities, publications, and other cool stuff!

Need help with a school project? We've designed this newspaper to provide you with the resources to do research, clip pictures, develop a science fair or classroom experiment, and spend some time out of doors on your own. If you're still stumped on something that has to do with Badlands National Park, email us at badl_interpretation@nps.gov. Remember to allow us at least four days to get back to you.

What You Can Do At Home

How can you help special places like the Badlands from your distant home? By doing the same wise practices we should all do everyday to help conserve our natural resources and learn more about our history so we make better decisions about the future.

Reduce-Reuse-Recycle

You've probably heard this before but it's truly becoming a necessity. Don't forget the three R's in the environment. If more people followed these three R's, we could help reduce the amount of trash put into landfills, which require large amount of land, taking that space from other uses. It also lessens the amount of resources we use - like trees that become paper or oil that creates plastic products.

Reading-wRiting-aRithmetic

These are the OTHER three R's - the ones your teachers are very familiar with. You can also help by reading as much as you can about your favorite places and stories. Chances are - there's a national park with a story important to you. Contact national park staff with questions and concerns about their jobs and workplaces. Write letters to elected officials to let them know how you feel about issues and activities that impact your family or home. And - you do the math. Keep track of numbers relating to your special interests. Are there more or less animals protected, history sites preserved, or visitors arriving? How is money being spent? Watch your own backyard. Are you seeing fewer insects, birds, or other critters? Are there fewer parks for you to explore? Is your family spending more time - and money - having to control weeds in your yard? Are you spending more time reading, writing, or watching?

Weed Watch

Learn about native plants of your area. Try growing them around your house or in pots inside. (Remember that reuse idea - grow them in food containers like large plastic food tubs or metal coffee cans.) Before you plant anything in the ground, get permission first! Need some help? Visit:

www.enature.com/native_invasive/
www.wildflower2.org

Leave No Trace

There is a national movement called Leave No Trace, a philosophy that encourages us all to be low impact visitors to any place. A simple concept is *Take Only Pictures, Leave Only Footprints* every time you explore. Many parks offer special Leave No Trace activities and materials. To learn more about this ethic, visit www.lnt.org. A website has been designed especially for kids at www.treadlightlykids.org



Join Us

Become a Junior Ranger! Most national parks have a Junior Ranger program offered either as a program or a booklet. Many are available online at www.nps.gov/learn/gozone.htm. Becoming a Junior Ranger could be the first step you take toward someday being a "real" ranger in a national park! Remember, if you complete the activities in this newspaper and send your results to **Pinnacles Post Ranger; Badlands National Park; P.O. Box 6; Interior, South Dakota 57750**, you will become a Badlands Junior Ranger and receive a badge and a certificate that serves as your "stake" in Badlands history!

Go Nationwide with WebRangers

You can also become a WebRanger by going to www.nps.gov/webangers. There you will find fun games, quizzes, and other activities that teach you about the different national parks. Before you begin, you must commit to the WebRanger pledge:

*As a National Park Service WebRanger,
I promise to learn about our national parks,
to help care for them, and to care for my
surroundings.*

This pledge sums up the best way to help out the National Park Service and its special places - learn about them, explore them, enjoy nature and history. Hopefully, you'll better understand the importance of taking care of what we have - whether at home or at a distance.

Need to Talk With a Ranger?

Email Chief of Resource Education Marianne Mills at marianne_mills@nps.gov anytime with questions about Badlands National Park or careers with the National Park Service. She started out as a volunteer in her Illinois hometown historical society, volunteered at Grand Canyon, and has now worked at 15 units of the National Park System ranging from Alaska to the U.S. Virgin Islands and helped out in a national park in the nation of Hungary!

Want more information about Badlands National Park sent to you?

Email badl_information@nps.gov
Write Badlands National Park; P.O. Box 6; Interior, South Dakota 57750
Phone (605) 433-5361

About the Author

The *Pinnacles Post* was written by Corree Seward, a native of Texas and a graduate of Unity College in Maine. Corree volunteered as a park naturalist during the summer of 2005, then was hired as a Park Guide at Badlands. She gives programs to both park visitors and in area classrooms to grades 1 through 6.

Corree majored in environmental writing and is excited to start her ranger career. She lists her favorite parts of her job as:

- *Getting to explore the natural history of a different part of the country. I came here with a love of life sciences and am leaving with a new found love of geology.*
- *Becoming a part of people's vacations. They might remember something you said, and it might inspire them to learn more or care more about nature or history.*
- *Swearing in Junior Rangers. It's great to see how excited kids can get about nature and national parks. Perhaps I've awarded badges to future park rangers and naturalists and scientists.*



Corree presents a Fossil Talk to families visiting Badlands National Park.