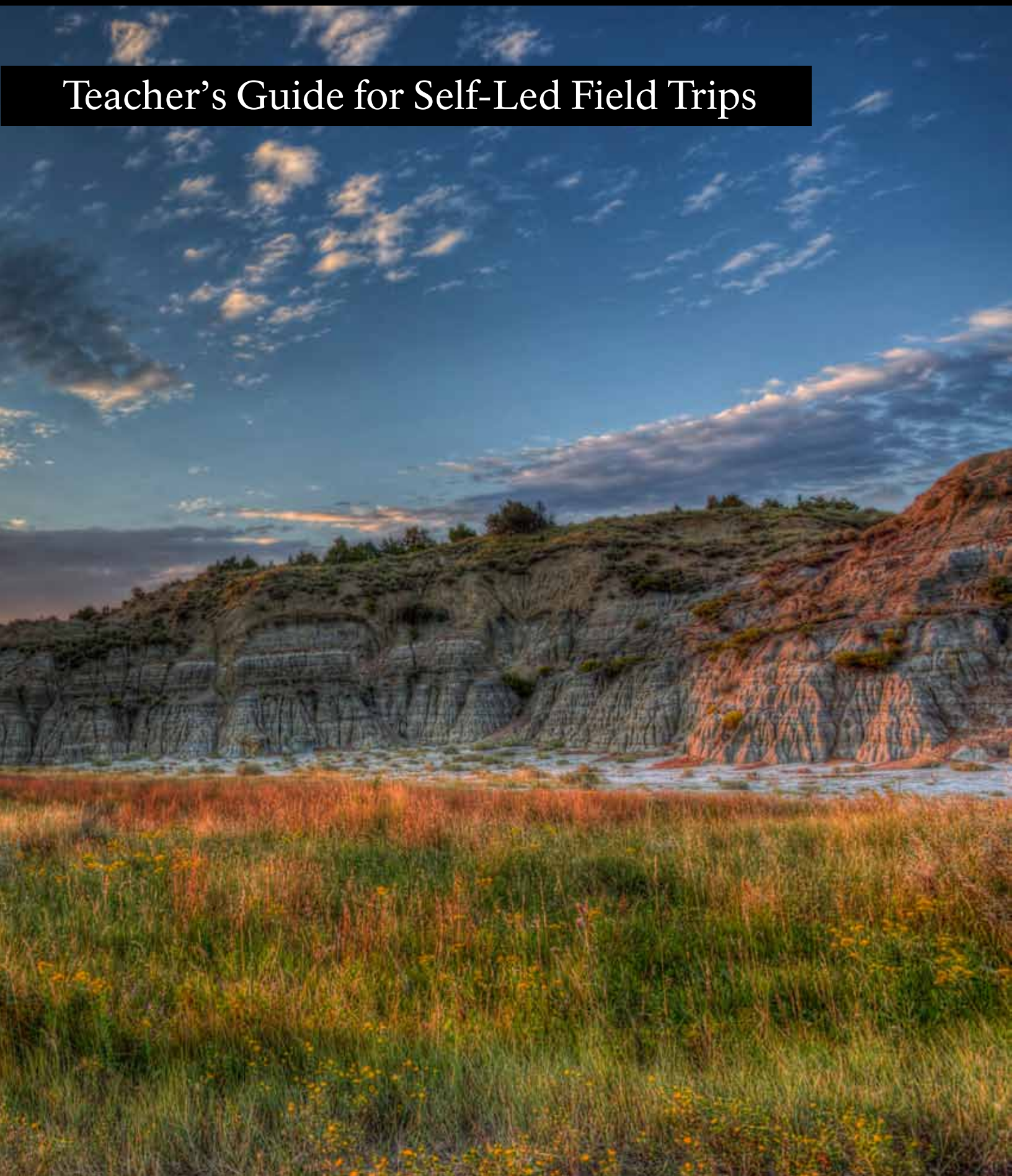
Theodore Roosevelt

National Park Service
U.S. Department of the Interior

Theodore Roosevelt National Park
North Dakota

Teacher's Guide for Self-Led Field Trips



"Of all the questions which can come before this nation... there is none which compares in importance with the great central task of leaving this land even a better land for our descendants than it is for us."

~ Theodore Roosevelt

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2 *Theodore Roosevelt National Park*

Park Background

Theodore Roosevelt National Park was established in 1947 as a national memorial park to honor the memory of the 26th president, and to protect the natural and cultural resources found within its boundaries. The area was redesignated as a national park in 1978; this redesignation also established nearly 30,000 acres of wilderness as a part of the 70,448 acre national park.

Today, Theodore Roosevelt National Park is comprised of three separate units. The largest is the South Unit, the entrance of which is located in the town of Medora along I-94. Approximately 70 miles north, the North Unit of the park is near Watford City off of US 85. Finally, the Elkhorn Ranch Unit encompasses the smallest area. Nestled between the other units and nearly as isolated as when Roosevelt had his ranch house built there in 1885, the Elkhorn is only accessible through unimproved roads. Connecting them all is the Little Missouri River and dramatic landscape of the Badlands.

Educational Opportunities

Whether you are teaching a unit about Theodore Roosevelt, discussing ecosystems, or learning geology, the national park abounds in educational opportunities for you and your students. The vast open spaces, abundant wildlife, and spectacular scenery provide an optimal setting to engage the minds of young people. Students are always excited to get out of the classroom, but with a little bit of planning and preparation, a visit to Theodore Roosevelt National Park can become more than just a field trip. This guide will detail those preparations, as well as suggest ways to enhance your educational experience both before and after your visit.

The Park as Your Classroom

The outdoor classroom of Theodore Roosevelt National Park is full of possibilities, and what you do with your time here is your decision. However, there are several advantages to utilizing the park as an educational resource. Below are several goals which the national park can help accomplish:

- Reinforce classroom taught, curriculum based lessons and materials
- Acquaint students with the natural plants, animals, and habitats of their home region
- Develop in students a sense of stewardship for their home communities
- Engage students to think about and act upon local and current environmental issues

As an educator, you understand that rarely is a concept or idea grasped in a single lesson. It requires the right mix of appropriate resources and techniques, as well as dedication from both students and teachers. Although exposure to the great outdoors is critical, effective environmental education truly begins before setting foot outside; the national park can provide the setting and the stimulus to help you make a lasting impact on the lives of your students, but only if the seeds are planted before your trip.

Before you come...

A trip to the national park can be a very worthwhile educational experience, or it can just be a fun field trip. The difference occurs days (or weeks) before you even bring your class out to the park. By introducing your students to concepts in the school classroom, you begin to build a strong foundation for their trip to the outdoor classroom of your national park. This type of preparation is referred to as "pre-site," because it occurs before your visit to the educational site. Your trip to Theodore Roosevelt National Park will most likely only last a short time, but effective pre-site will guarantee that time as memorable and educational.

The following page details some of the curriculum topics the park can help address. Use these topics to create lesson plans that take place inside the classroom, to help your students develop an understanding of the park's resources. By preparing your students with lessons related to the park, their time spent in the resource becomes exponentially more meaningful.

4 *Pre-site Activities*

Learn Before You Come

An educational field trip to a national park should have a specific focus or goal for the students. Rarely will a park be able to offer a full curriculum, but will rather provide an opportunity to help you teach a specific lesson. For Theodore Roosevelt National Park, those opportunities can be generalized into three curriculum-based categories:

- Life Sciences
- Earth Sciences
- Social Studies

When planning a curriculum for one of these subjects, consider what role Theodore Roosevelt National Park can play in helping you teach your lesson(s). Many of the ideas discussed in this section have associated lesson plans available on the park website, and can be found through the main "For Teachers" page:
www.nps.gov/thro/learn/education/index.htm

Please note that many of our lesson plans focus on a 4th-6th grade curriculum. However, the ideas behind those lessons, as well as the topics suggested here, are easily applicable for students of all ages. Page 23 of this guide will address other ideas to help you prepare for your trip.

Life Sciences

The park is a fantastic resource to show your students the interconnectedness of the natural world. Any lesson related to ecology (i.e. plants, wildlife, habitats, food chains, etc.) can be adapted to use the park as a resource. With many iconic prairie animals such as prairie dogs and bison, and numerous other species from grazers to predators, students can learn about how these creatures survive and depend upon each other in their native environment. Lesson plan ideas include:

- Plant/Animal Adaptations
- Food Chain/Web
- Plant/Animal Identification
- Habitats and Communities
- Human impacts on natural ecosystems

Earth Sciences

The North Dakota Badlands have fascinated geologists for decades, and provide a fantastic landscape for your students to learn about geologic processes. From studying rock types and formations, to looking at how landscapes are shaped and formed, the park offers great opportunities to study Earth's systems. Lesson plan ideas include:

- Weathering and Erosion
- Deposition
- Rock types
- Astronomy/Night Skies

Social Studies

Theodore Roosevelt National Park is the only national park which is named for a person. The man who would later become our 26th president spent parts of his formative years in the Dakota Badlands, and that time left an indelible impression upon him. Through the park's cultural resources, students can learn about an intriguing chapter of the fascinating life of Theodore Roosevelt. The park also provides an opportunity to learn about the overall significance of national parks, and how the impacts of modern development affect the park. Lesson plan ideas include:

- Contributions of Theodore Roosevelt
- Frontier life of the 1800s
- National/State economics
- Physical/Human geography
- Mission of the National Park Service

Enjoying Your National Park 5

"To conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

- National Park Service Organic Act, 1916

Visiting a National Park

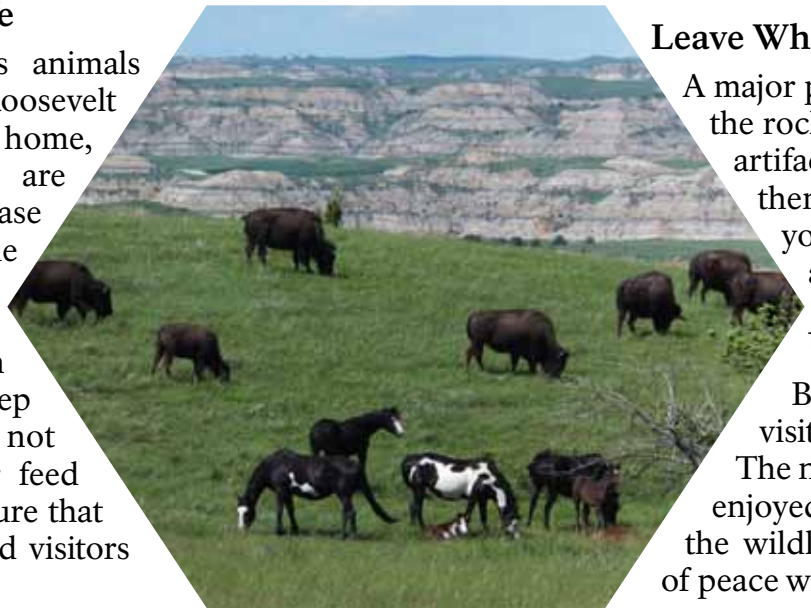
The National Park Service is comprised of over 400 units across the United States and its territories. These parks have been set aside to preserve our natural and cultural history, and it is the responsibility of the people to look after them. As such, there are several rules and safety guidelines to review with your students, staff and chaperons before your visit.

Leave No Trace

Many outdoor enthusiasts adopt an ethic referred to as "Leave No Trace" (LNT). Just like it sounds, it encourages people to visit an area without leaving anything behind. The best policy is to "pack out what you pack in," but we do have trash and recycling containers within the park. If you are eating lunch in the park, make sure your group does not leave any crumbs or wrappers behind!

Respect the Wildlife

There are numerous animals that call Theodore Roosevelt National Park their home, and as humans we are only visitors here. Please remember that all of the animals in a national park are wild, and any wild animal can be dangerous. Keep your distance, and do not attempt to harass or feed wildlife. This will ensure that both the residents and visitors of the park stay safe!



Protect the Plants

As Theodore Roosevelt said, "flowers should be enjoyed unplucked where they grow." Flowers in bloom are busy producing pollen and seeds for next year's generation, and if picked may not be around for future visitors. Additionally, many of our other plants and grasses are struggling to survive in a harsh prairie environment. Keep to the trails when hiking, and be mindful to avoid locations that announce "revegetated areas."

Don't be a Graffiti Gremlin!

The temptation to leave our mark wherever we go is one that must be avoided while visiting the national park. Carving names, dates, initials, etc. into anything both damages the resource and detracts from the experience of other visitors. Similarly, breaking any rocks or formations can undo thousands of years of natural processes. Remember - Leave No Trace!

Leave What You Find

A major part of LNT is to leave the rocks, plants, animals and artifacts where you find them. The only souvenirs you should bring home are memories.

Use Inside Voices

Be mindful of other visitors and park wildlife. The national park should be enjoyed quietly, to maximize the wildlife viewing and sense of peace which parks protect.

6 *Packing Your Bag*

What to Bring

Once you have prepared your students with pre-site activities and an overview of park rules, you are almost ready to lead your students on their most exciting field trip ever! Included on this page are several things you want to make sure you and your group are bringing with you, as well as a few things not to bring.

- **Chaperons** - Depending on your group size, it may be necessary to recruit some support! A ratio of one adult per ten students is usually adequate. Too many adults can be a distraction.
- **Name tags** - A simple piece of masking tape and permanent marker work wonders, especially if you are bringing adults who are not familiar with your students.
- **Bag lunch** - If you are planning to eat in the park, remind your students about Leave No Trace. A lunch of all disposable items makes cleanup easy; gathering all lunches in boxes or coolers makes them easy to transport (and reduces the chance of a student losing anything). There are designated picnic areas in both the North and South Units of the park.
- **Outdoor clothing** - Make sure your students are prepared to spend a day outside. Long pants and sturdy, close-toed shoes are a must. Jackets, hats, and extra layers are encouraged, as the park is often windy, and weather can quickly change.
- **First Aid Kit** - A small kit for possible cuts and scrapes is always good to have. You should also include sunscreen, bug repellent, and any medications your students need.

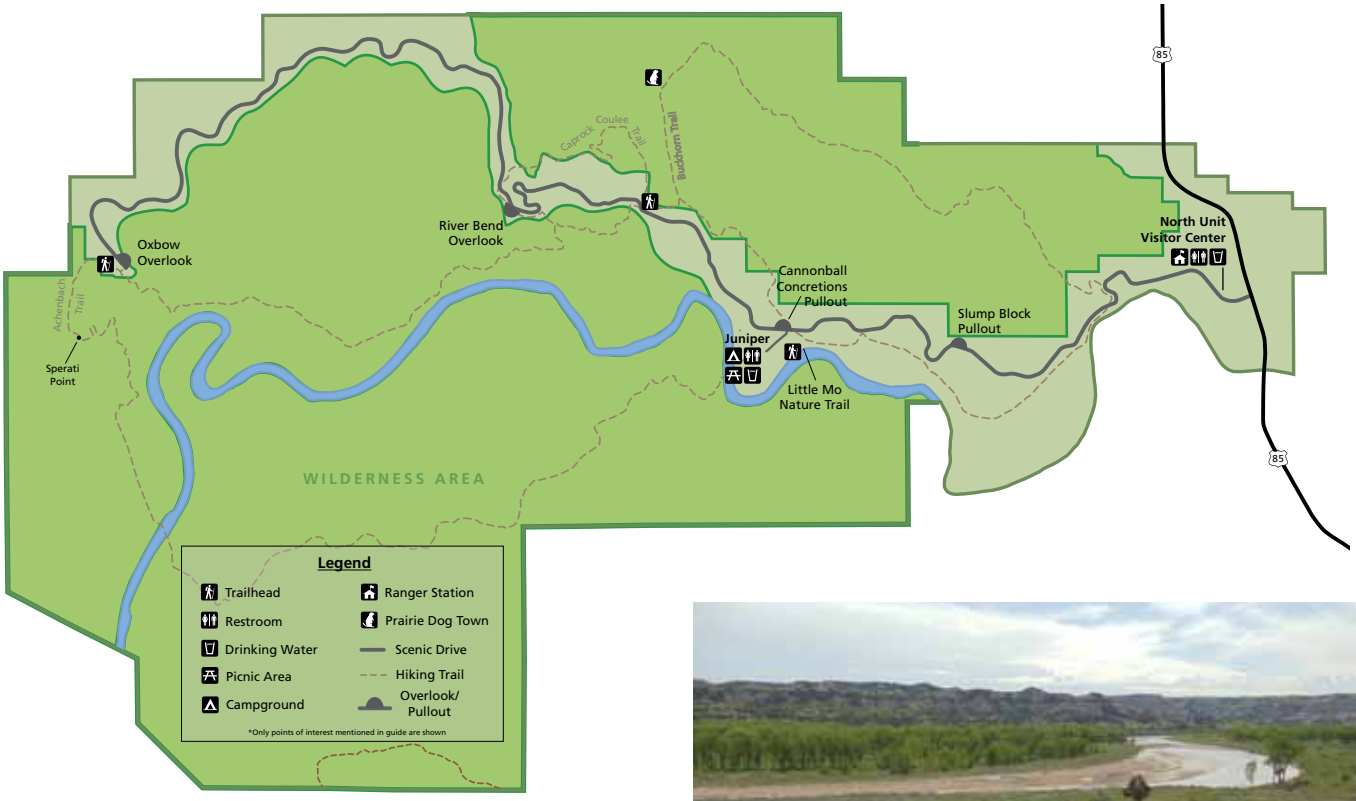
Pronghorn

What to Leave Behind

Certain items can create distractions while you are attempting to teach your lesson. Most items you would not want in your classroom are things your students should not bring to the national park. Furthermore, an environmental education program should provide young people an opportunity to disconnect from technology, and use their own senses to experience the wonders of nature. To benefit your students, make sure they leave behind:

- Cell phones/Smart phones
- Cameras
- Binoculars
- Tablets/other electronics
- Money
- Backpacks or tote bags

If necessary, collect items as students board the bus in the morning. Assign a fellow teacher or chaperon to be the designated picture taker. Remind students that they can visit the national park again to make purchases and take pictures.



North Unit

Receiving only a small portion of the park's total visitation, the North Unit remains a sanctuary of quietude and reflection amidst the quickening pace of life in northwestern North Dakota. Offering a beautiful scenic drive, several short hiking opportunities, and a quaint picnic area with shelters built by the Civilian Conservation Corps, the North Unit is an ideal place for an educational, outdoor experience. Accessible from nearby cities such as Watford City, Williston, Beulah (ND), or Sidney (MT), the North Unit is also about a two and a half-hour drive from Minot, ND. Whether coming for a long day, or only a short excursion, this section will help relate some of the possibilities of exploring Theodore Roosevelt National Park with your students.

Scenic Drive

From the park entrance along US-85, a 14-mile scenic drive takes you to the western edge of the park. Along the way, there are numerous pull-offs, overlooks and trail heads to explore. The first section takes you along the old flood plain, gaining elevation to bring visitors to the top of a vast prairie along the latter section of the drive. Driving time to the end and back will take just over one hour.

View from the top of the Little Mo Trail

Little Mo Trail

This trail starts from across the campground office, and can be accessed by walking from the picnic area. It has a short, 0.7-mile loop on rough asphalt, and a longer, 1.1-mile loop which includes natural surface. The trail is marked with several numbered posts, which correspond to a trail guide (available at the start of the trail) that will highlight many of the plants and geologic features seen along the way. With views of the Little Missouri River and other park features, the Little Mo Trail is a great introduction for your students to Theodore Roosevelt National Park. Be advised that most of the trail is very open, with little shade available.

8 *Visiting the Park - North Unit*

Caprock Coulee Trail

The trail head for Caprock Coulee is near mile-post 6 on the scenic drive. Like the Little Mo Trail, this trail has a guide which will help explain some of the features and geology which you will see along the trail. The trail guide follows 0.8-miles of a much longer 4.1-mile loop. Although somewhat narrow at the start of the hike, most of the beginning and middle of this trail are relatively easy to navigate with a group; there are several open spaces to stop for discussion or activities along the trail. After post #13, the trail is much narrower, with potential muddy or eroded areas which can make travel for a large group difficult. Although it is possible, it is not recommended to take groups larger than twenty people beyond post #13.

Caprock Coulee Trail is a fantastic place to allow your students to see the geology of the Badlands up close and personal. Here they can use their observation skills to look for signs of differential erosion and slumping. Furthermore, they can find and explore areas with bentonite clay, coal veins, and petrified wood. Science activities like drawing buttes or slides, and measuring the depth of the different layers or colors, can work very well here. There are also great examples of some common plants and biological communities along this trail.

Juvenile prairie dogs

Buckhorn Trail

The Buckhorn Trail is a long loop trail through the North Unit of the park, but a short section can be accessed at the same place as the Caprock Coulee trail head. From this spot, a hike of close to one mile will lead your group through a prairie and out to one of the few accessible prairie dog towns found in the North Unit. The start of the trail is similar to Caprock Coulee, and follows along the side of a butte before emerging out onto the prairie. The hike out provides a great opportunity for your class to share a moment of silence, and experience the natural sounds of the Badlands. The prairie dog town is an excellent chance to see these curious creatures up close, as well as looking for tracks and signs of other residents of the prairie community. Allow about one of hour of hiking time (not including stops) for this two-mile trek.

Exposed coal vein along the Caprock Coulee Trail

View from Sperati Point

Sperati Point

At the end of the scenic drive you will find Oxbow Overlook, which provides a nice view of the Little Missouri River as it winds its way through the Badlands. From the overlook, you can access the Achenbach Trail and begin a hike out to Sperati Point. At just over one mile, the trek itself is relatively easy, as you traverse through a rolling prairie with many types of native grasses and forbes. This is a great trail to see and discuss prairie ecology, and ends with a commanding view of the Little Missouri. From here you can teach about erosion, stream formation, or watersheds. The trail to Sperati Point (or the Point itself) offers a nice opportunity for a moment of silence.

Along the hike you will also see the occasional small boulder of igneous rock, called a glacial erratic. Although glaciers never came to this area of North Dakota, their presence was close enough to leave behind oddities like these rounded hunks of granite. Glaciations were also responsible for altering the course of the Little Missouri River, which led to the carving out of the Badlands we know today. The Achenbach Trail and Sperati Point offer opportunities for reflection on the changing landscape of the Badlands.

Other Points of Interest

As you drive through the North Unit, there are several places worth stopping, either for a quick rest, a great view, or an opportunity for learning. One of the first pull-offs along the scenic drive is Slump Block Pullout, just before mile-post 3. Here, you can see Badlands geology in action as you observe the erosive forces of water and gravity.

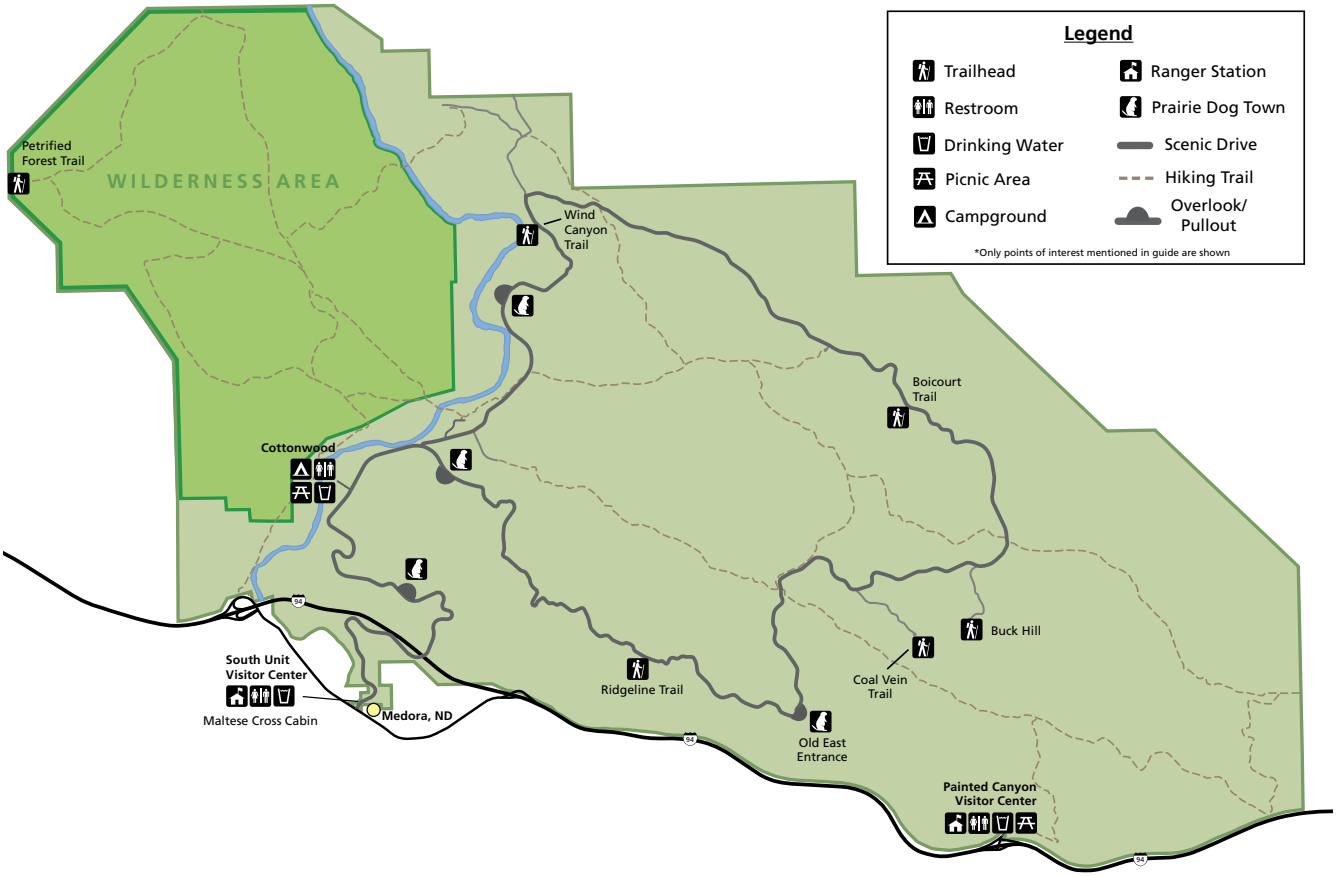
On the opposite side of the drive from the picnic area entrance is Cannonball Concretions Pullout; this area has numerous formations of spherical sandstone, exposed after millennia of erosion of the softer clays and soils. Concretions like these form when the right mix of water and minerals come together to create a natural cement, which slowly builds around a central object such as a rock or fossil.

After the drive climbs to the top of the prairie, River Bend Overlook is a great place to stop and take in the view. An old shelter, built by the Civilian Conservation Corps, still sits at this overlook, and offers a good location to discuss park development and CCC history.

Near the Little Mo Trail, you will find the Juniper Campground and Picnic Area, which is an ideal spot to relax and enjoy a lunch in your national park. With ample grass space, tables, and shelters all shaded by large cottonwood trees, the picnic area is a welcome change to the school cafeteria! This is also the only place in the North Unit - aside from the Visitor Center with rest room facilities and running water.

Picnic Area at Juniper Campground

10 *Visiting the Park - South Unit*



South Unit

With easy access from Interstate 94, the South Unit provides a place of enjoyment for both regional residents and travelers from around the world. It boasts a scenic loop road, numerous short hiking opportunities, the historic ranch cabin of Theodore Roosevelt, and a shaded picnic area, in addition to many other recreational opportunities. Located a short distance from towns like Beach, South Heart (ND) and Wibaux (MT), the South Unit is also only 35 miles from Dickinson, ND, and about two hours from Bismarck, ND or Miles City, MT.

Scenic Loop Road

From the South Unit Visitor Center, the park road winds about six miles into the Badlands before splitting into a loop. Along this 24-mile circuit, you are likely to see several examples of park wildlife, including prairie dogs, bison, and feral horses. The road takes you through a strange landscape of buttes, prairies, capstones and creek beds, showing much of the geographic diversity of the Badlands. There are numerous places to pull off and enjoy the dramatic landscape and interesting wildlife, as well as several trails for hiking and exploring the park. The entire route to return to the visitor center is 36 miles, and takes one and a half hours of travel time.

Ridgeline Trail

A small parking area just before mile-post 11 allows access to this trail. There is a trail guide available which corresponds to numbered posts along the route to help interpret the trail for you. True to its name, a steep climb will take you to the top of a ridge to enjoy views of the park. These steps can be a challenge for our shorter visitors, and are often muddy and slippery days after it rains. Up to post #8, there are several places to stop and gather a group. From here, the trail descends the ridge and becomes steep and narrow as it loops back towards

the starting point. The total distance is 0.6 miles.

Views from the trail show both inside and outside of the park, and provide a good setting to discuss human development, soundscapes, and noise pollution. Ridgeline Trail experiences a high volume of visitors, and there are several signs posted to direct people away from unofficial social trails to allow natural rehabilitation of the area. For all of these reasons, this trail can be a good place for older students to see and discuss the impacts of human use on natural environments. The trail is also a great place for younger groups to experience the park, but large numbers can be difficult to manage on this trail.

View from Ridgeline Trail outside of Park

Old East Entrance

This area is shown on our park maps, but is found at an unmarked pullout before mile-post 13. With low visitor use and large, open spaces, this is the most ideal spot in the park for bringing a large group of students. From the road, you can see the roof of the building which gives this site its name. Near the parking area are several buttes where students can examine the layers of the Badlands, and learn about park geology. You can reach the Old East Entrance by walking through a prairie dog town, which provides an excellent setting to discuss ecology topics. The building itself was constructed by the Civilian Conservation Corps in the 1930s. One can still find chunks of the old road that passed through this spot, now transformed into prairie dog town.

Due to its resources, size and location, the Old East Entrance area is highly recommended for any and all types of educational excursions.

Coal Vein Trail

After mile-post 15, a sign directs you down a 1-mile dirt road to the trail head for Coal Vein. Named for a coal seam which burned from 1951-1977, this trail offers an opportunity to learn about the special processes of Badlands geology. Along this 0.8-mile trail, one will find slopes of bentonite clay, exposed (unburned) coal veins, and fascinating examples of clinker. Metamorphosed by the heat of the burning coal, clinker is a brick-like rock often red in color, but samples of purple, orange, pink or yellow can also be found.

The relatively open spaces at the beginning and end of this trail make it a good place to take groups. Coal Vein Trail is most appropriate for a geology lesson, but also offers an interesting look at the links between geology and biology.

Clinker along Coal Vein Trail

12 *Visiting the Park - South Unit*

Buck Hill

One of the highest points in the park, Buck Hill is reached via a 1-mile side road at mile-post 17. A short but steep asphalt trail takes you from the parking area to the top of the hill for a commanding view of the park. Buck Hill is covered in sandstone, evidence of an ancient river or flood plain from millions of years ago. With ample space near the parking area or on the hill, this area can be good for a large group, and provides a chance for your students to stretch their legs and take in the view. In the spring, you may even hear frogs living in the vernal pools in the prairie below Buck Hill.

View from Buck Hill

Boicourt Trail

Pronounced "by-court," this trail is marked by a sign at the middle of three pull-offs between mile-posts 19 and 20. A wide gravel path soon narrows to a dirt trail which dead-ends at the top of a small ridge. Around and below the trail you will see the amazing buttes and strata of the Badlands, while off in the distance is the rolling prairie which makes the heart of the park. The views here are truly spectacular. Although the pull-offs are popular, the trail experiences low use and extends far enough away from the road to provide a good setting for a moment of silence. While the trail and its views extend southwards into the park, the pull-offs also have views to the north, outside of the park. This provides an opportunity for students to see how industry development can affect even remote areas such as our national parks. Whether at the parking area or along the trail, there are several open areas to gather your group for a lesson.

Little Missouri River at Wind Canyon

Wind Canyon Trail

Near mile-post 25 is a marked parking area for the Wind Canyon Trail. A relatively short, 0.3-mile trail takes you next to Wind Canyon, then follows a ridge alongside the Little Missouri River. Providing one of the few views of the river in the South Unit, Wind Canyon Trail is a great place to learn how water has shaped the Badlands. With multiple examples of weathering and erosion, Wind Canyon is an ideal setting to discuss the park's geology. There are places to gather a group, but more than 40 individuals can become unwieldy on a short trail such as this. The canyon itself can be explored in small groups; many people have carved graffiti into the canyon walls over the years, so this setting can lead to discussions of preserving park resources, and communal ethics of caring for our natural areas.

View from Boicourt Trail

Maltese Cross Cabin

Behind the South Unit Visitor Center, just inside the park entrance, sits Theodore Roosevelt's Maltese Cross Cabin. This is one of two ranch cabins which Roosevelt used during the 1880s while he was a ranchman in the Dakota Territory. Generally, the cabin is open for self-guided tours from late September until the end of May. Starting at the beginning of June and throughout the summer season, the cabin is only open for scheduled Ranger Programs. As the park's most significant cultural resource, it provides an excellent setting for students to learn about Theodore Roosevelt's time in the Badlands, and how his experiences in North Dakota helped to shape the man who would become president. Inside, students will see what late 19th century frontier life was like, with artifacts that belonged to Roosevelt and other articles representative of the time period when the Badlands was his second home.

Other Points of Interest

The South Unit offers many opportunities for your students to experience their national park. A museum at the South Unit Visitor Center has displays on Theodore Roosevelt and information about the Badlands. The Visitor Center is also only one of two locations in the South Unit with rest room facilities and running water.

In addition to the several trails and locations discussed above, there are many other hiking trails,

overlooks, prairie dog towns and unmarked pullouts where one could have an educational experience. For more adventurous groups, an excursion to the Petrified Forest can be a memorable experience. Accessed from the park's western boundary, the trail head is reached via a 7-mile drive over unpaved roads. Not recommended for buses or similar vehicles, road conditions are generally good, but can deteriorate with heavy rains.

At exit 32 along Interstate 94 is the Painted Canyon Visitor Center. Aside from one of best views in the entire Badlands, Painted Canyon has rest rooms, picnic benches, a small visitor center, and a paved walk along the canyon rim. If your time permits, this is a great place to stop either before or after visiting the South Unit.

About 5.5 miles into the park is the Cottonwood Campground and Picnic area. The picnic area is nicely shaded, and includes a large shelter which can accommodate large groups. With water, grills and bathrooms, this spot offers a place to relax, cool off and enjoy lunch outdoors.

14 *Badlands Basics - Ecology*

Badlands Basics

In order to teach, one must first learn. A major challenge about leading your own field trip to a national park is learning enough to use it as an effective educational resource. The following sections are designed to teach you some basic concepts about the Badlands. Always remember that you can utilize the park website, other online resources, or park staff to gain more knowledge about any particular topic.

Prairie along Buckhorn Trail

Prairies

Theodore Roosevelt National Park is known for barren buttes and dramatic landscapes, but the majority of the park is actually prairie habitat. Receiving a low average of annual precipitation, it is considered a short-to-mixed grassland, as opposed to the wetter tallgrass prairies farther east. A prairie is not just grass, however; a huge diversity of plants, including grasses, forbes, shrubs and trees, intermingle in this dry climate to create a patchwork of green amidst the more muted colors of the Badlands.

Prairies are also where you will find most of the park's wildlife, as it provides the main food source for the majority of our primary consumers. The plants that live on the prairie are well adapted to survive this harsh environment, many having extensive root systems up to 20 feet underground, allowing them access to water in a dry area. These deep roots also anchor plants against gusty prairie winds, and allow grasses to resprout after periodic fires. A natural part of the ecosystem, fire helps rejuvenate a grassland by clearing old brush and returning nutrients to the soil. Although some trees and shrubs will show evidence of a fire for many years, it only takes a few short days for grasses to return and the prairie to green once more.

North and South Slopes

The buttes and hillsides of the park provide their own interesting habitats. Slopes which face north tend to accumulate more winter snow, and receive less direct sunlight, than their southern counterparts. This creates a wetter, somewhat shadier environment that is conducive to larger plant communities, primarily juniper trees. Over time, these slopes become small forests, providing shade and shelter for many species. Large browsing animals such as elk like to relax near these forested areas during the heat of the day. Many small birds nest in the thick stands of juniper trees. With more vegetation, north-facing slopes erode much slower than south-facing slopes. As such, south-facing slopes are often steeper and more dramatic. The buttes in the photo above face mostly south, hence the limited amount of trees and vegetation.

Sagebrush

For many people, the smell of sagebrush evokes distinctly western sentiments. Driving through much of the western prairies, you will see varieties of this shrub growing throughout the grassland habitat. With a very pleasant aroma, some are reminded of Thanksgiving dinner or another favorite meal, but the types of sage found on the prairie are completely different from what you have in your kitchen spices. Of the seven different varieties found in Theodore Roosevelt National Park, silver sagebrush is one of the most common. This is a great resource to have your students use all of their senses for observation. Reminding them to be gentle with the plant, have them feel the branches and leaves, smell the plant, and describe what it looks like. Sagebrush has uses as an incense, bug repellent, medicinal tea, and numerous other applications. As part of the prairie habitat, it provides shelter for smaller animals and an important winter forage for many species.

Prairie Dogs

One of the most iconic animals of the park, black-tailed prairie dogs are found throughout the South Unit along the loop road, and in the North Unit along Buckhhorn Trail. A type of ground squirrel, they are a communal, burrowing rodent that can be quite entertaining to observe. Living in large colonies, commonly called "dog towns," prairie dogs spend most of their day foraging for food and looking out for predators. You will often see them standing atop the mounds they construct to help them gain a better vantage point for keeping watch. With a highly developed communication system, prairie dogs use a litany of barks, chirps, yips and other sounds to warn their neighbors of possible dangers.

Prairie dogs often have a bad reputation amongst ranchers for taking over grazing habitat and creating dangerous holes which horses or cattle may step in and injure themselves. As such, black-tailed prairie dogs were driven to near extinction by the 1960s. However, the reality is that prairie dogs represent their ecosystem as a keystone species. Large grazers and browsers are often found in or near dog towns, eating the fresh vegetation that grows courtesy of the rodent's constant trimming. Other rodents or animals like the burrowing owl rely on empty prairie dog burrows for homes, while the prairie dogs themselves are a critical food source for many of the park's predators. The fear of injury to livestock seems to be unfounded, as researchers have failed to uncover any actual incidents of this happening. The truth is, without prairie dogs, the prairie habitat would struggle to support other life.

Feral Horses

In the South Unit, bands of feral horses can frequently be seen around the park. Descendants of horses originally from domestic stock, these horses are not classified by a specific breed or name. Feral horses were common on the open rangeland of Roosevelt's day, and represent the cultural lifestyle of ranching in the Dakota Territory.

16 *Badlands Basics - Ecology*

Bison

The American plains bison roams the prairies of Theodore Roosevelt National Park as they once did in a time even before Roosevelt came to the Dakota Territory. Almost completely lost to the American landscape by the end of the 19th century, bison were reintroduced to the park in the 1950s and 1960s, and today several hundred can be found in both the North and South Units. The largest land animal in North America, bison often move in herds, but small groups or solitary males can be seen frequently. Like prairie dogs and many other park animals, bison have their young in the spring, and visiting the park at this time is a great chance to see calves exploring their new world. If you drive one of the park's scenic roads, chances are high you will see bison.

Pronghorn

More frequently seen on the open grasslands outside of the park, it is not uncommon to find pronghorn grazing on the prairie within park boundaries. Although they can reach sprinting speeds up to 60 mph, pronghorn are not very confident jumpers, and prefer going under the park fences, as opposed to jumping over them. Their horns are a curiosity, as they have an antler-like outer sheath which sheds every year like deer or elk, but the core grows with the animal its entire life, like the horns of bison or bighorn sheep.

Elk Herd

Other Large Herbivores

Generally, white-tailed and mule deer are most active during twilight or nighttime hours, and can be seen in either unit of Theodore Roosevelt National Park. Like deer, elk are hard to spot during the day, but a large herd finds a home in the South Unit. Commonly hunted by Roosevelt, elk had vanished from the area by the time the park was established, but were reintroduced in 1985. Another reintroduced species is the bighorn sheep, found only in the park's North Unit. Often on steep hillsides and buttes, bighorn sheep blend well and are hard to spot, but can be a memorable experience for those lucky enough to see them. Easier to see in the North Unit is a demonstration herd of Texas Longhorn cattle, representative of the ranching industry of Roosevelt's time.

American badger

Predators

Today, the most common predator seen in the park is the coyote. A lucky visitor might spot a badger digging in a prairie dog town, or even see a bobcat on the prowl. Unfortunately, the large predators which used to roam this region have mostly disappeared. Historically, grizzly bears, wolves and mountain lions sat at the top of the food chain, but today only the occasional sign of a mountain lion passing through the park is found. The absence of natural predators requires that the National Park Service manage their numerous groups of large herbivores, which can be an interesting topic for your students to discuss or debate.

Birds

From small songbirds like the western meadowlark (a favorite of Roosevelt's), to giant raptors like the golden eagle, the park abounds with many bird types. At dog towns, keep an eye out for burrowing owls standing near burrows. For a fun sensory activity, find a nice place for your group to do a moment of silence, and have each person quietly count the different bird calls they can hear.

Brief Geologic History

The Badlands is a fantastic area to study geology, because the exposed layers and features allow one to see evidence of geologic processes both ancient and recent. The various layers and colors, or strata, you see while driving through the park accumulated over millions of years through a process referred to as **deposition**. When the Rocky Mountains began to form to the west, tens of millions of years ago, they were covered with deep layers of sediment. Those materials eroded and began to deposit in present-day North Dakota. Other deposition occurred as the interior of the continent was covered with a vast inland sea, rising and falling over the millennia to create both aquatic and swampy environments.

The exposure of those deposits occurred much more recently, when glaciers altered the course of major river systems. The Missouri River and many of its tributaries at one time flowed north to Hudson Bay. Although glaciers never occurred in the present-day park area, glaciations just north of the region pushed many rivers out of their course, and redirected them over a shorter and steeper area. Starting around 600,000 years ago, the altered Little Missouri River began carving out the formations we know today as the Badlands.

Weathering and Erosion

The formations you see while traveling through the park are products of two major geologic processes: erosion and weathering. Simply, **erosion** is movement of material from one place to another, while **weathering** is the breaking down of material where it currently sits. The Little Missouri eroded the landscape to expose the various layers of deposition. Different types of erosion and

weathering have continued to alter the features and terrain throughout the park.

Weathering is a geologic force which not only can create strange forms and features, but also makes those features more susceptible to erosion. A common form of physical weathering occurs as water seeps into cracks in the rock, freezes, and expands to split rocks apart. If the water does not freeze, it can evaporate, leaving salt crystals behind to expand and break down the rock on a very small scale. Known as salt weathering, this process leaves rounded holes in rocks and cliff sides.

Water is also one of the most powerful forces of erosion, especially in Theodore Roosevelt National Park. Sudden storms and torrential rains can have a drastic effect on an otherwise dry area. Along parts of the Little Missouri River and the several creeks that feed into it, one can see steep cliffs known as cut banks, where the river has been carving into the land and carrying away the sediments downstream.

Erosion is also caused by wind, which every North Dakotan knows as a powerful, unrelenting force. Wind helps to smooth out many of the shapes and features exposed by other processes. Wind Canyon, in the South Unit, is a great place to see the tandem action of water and wind.

A third major cause of erosion is gravity, commonly referred to as mass wasting. Many buttes contain uncompacted, loose sediments and clays. When conditions become unstable, frequently due to other erosive forces, gravity can cause small pieces, large boulders, or entire hillsides to move down slope.

18 *Badlands Basics - Geology*

Layers of Color

The various strata seen in the Badlands are clues to the environment from millions of years ago. Areas of grayish-blue are a substance called **bentonite clay**, created from the deposition of volcanic ash which originated hundreds of miles to the west. Cracked and rough when dry, bentonite clay is extremely absorbent, and will swell many times its volume during heavy rains. This causes it to drift down slope in mini-mud slides, making travel for humans and wildlife alike treacherous. As an absorbent material, the clay has many commercial and industrial uses, such as cat litter or machinery lubricant.

Tan or beige rocks are often found at the top of buttes, or strewn about hillsides like fallen building blocks. These are primarily **sandstone**, and are left over from ancient rivers and inland seas. The blocks are broken apart by a weathering process when water seeps into crevices, freezes, expands, and cleaves the rock. Frequently, one will find holes in these sandstone blocks, a result of salt weathering carving out these strange pock marks.

Dark seams of **lignite coal** can be seen in the strata of many buttes, remnants of the lush vegetation that once thrived in this region around 60 million years ago. A wet, swampy habitat dominated by cypress trees and reptiles, the Badlands used to resemble the environments of the southeastern United States. As the plant matter became buried, time and pressured turned the carbon-based life into coal, which would later become exposed as the landscape eroded.

Occasionally, these coal veins will ignite, and begin to bake the surrounding rock and materials. Clays and sandstones metamorphose under the heat of the burning coal, and are transformed into a new rock referred to as **clinker**. Sometimes called scoria or porcelanite, clinker is frequently red-orange in color, but samples of pink, purple and yellow can also be found.

Petrified Wood

One of the clues to the swampy environment which existed here millions of years ago is found in the petrified wood scattered throughout the park. A trail in the western section of the South Unit leads to the largest concentration of petrified wood, but samples can be seen throughout both park units. The process of petrification occurs when a tree is buried before it has a chance to decay; silica minerals seep into the cells of the tree, and slowly the organic material is replaced with quartz to become a fossilized version of the once living organism.

Hoodoos

Exploring the Badlands, visitors are often intrigued by the strange, column-like formations they find in the landscape. These columns, or hoodoos, are formed by a process called differential erosion, meaning that different materials erode at different rates. Much of the deposition material is soft and easily eroded, but sometimes a harder material - such as sandstone, clinker, or petrified wood - protects the softer material directly underneath. The harder material is referred to as a caprock, and can sit atop its pillar for thousands of years, until the structure can no longer support the caprock and the whole thing topples over.

Slumping

An interesting occurrence in Badlands geology is a phenomenon known as slumping, a type of erosion more generally called mass wasting. At times, hillsides and entire sections of strata will literally slump downwards when their foundations are altered. Causes include over-saturated bentonite clay sliding down slope or burning coal seams removing the lignite vein from a butte. The result is a disruption in the linear appearance of the butte's strata, or a slumped look to the hillside.

20 *Badlands Basics - History*

Theodore Roosevelt

This section of the Badlands Basics will focus on the history of Theodore Roosevelt's time in the region. The full history of this area is as varied as the people who have lived here, from Native Americans through European explorers to the pioneers of the 1800s; for brevity, only those parts relevant to the man honored by the national park will be addressed here.

Roosevelt was born to a wealthy family in New York City. Despite frequent health issues as a young boy (mainly asthma), Theodore would grow up with a well-rounded education and a deep appreciation for wildlife and natural history. After graduating from Harvard, Roosevelt was elected to the New York State Assembly, and began a promising career in politics as he started a family with his new wife, Alice Hathaway Lee, soon to be pregnant with Roosevelt's first child.

Badlands Hunting Trip

In September of 1883, at age 24, Roosevelt followed up on an opportunity to venture west for a bison hunt. Originally, he was supposed to accompany a friend of his who had contacts in the region, but his friend backed out at the last moment and Roosevelt traveled alone. Despite a week of heavy rains and several personal hardships, Roosevelt's hunt was a success and he viewed the entire episode as a grand adventure.

Enamored with the people he met, and the lifestyle of the western ranchman, Roosevelt decided to invest in the cattle industry. Taking on his new acquaintances as business partners, Roosevelt left Dakota with a reason to come back: he would be a rancher in the western territories. Although this was a business investment, TR was not buying cattle to make money. Rather, Roosevelt relished the opportunity of riding the open range he had romanticized as a boy; he would embrace this new lifestyle and welcome all of the adventures associated with it. His new ranch would be run from the Maltese Cross Cabin, the structure which today sits at the South Unit Visitor Center.

Personal Tragedy

When Roosevelt returned to New York, he seemed at the start of a blessed life. That course would be drastically altered on Valentine's Day of 1884, when both his mother and wife died, only two days after the birth of Roosevelt's daughter. Pouring himself into his political work, Roosevelt soon sought an escape from his sorrows by heading west. Back in the Badlands, Roosevelt found even greater seclusion at a site he named Elkhorn, and began making plans to have a second ranch cabin built.

The Dakota Rancher

Over the next several years, Roosevelt would split his time between New York and his ranches in the Dakota Territories, staying weeks or months at a time in the West. He would spend his time hunting, writing, and working with other cowboys and ranchmen. An obvious outsider, Roosevelt soon proved his worth to the speculative Westerners, and earned a place of respect in their society. His experiences with the men and women of the West would prove invaluable in his later life and political career, lending him a rapport with the "common man" that few politicians, before or since, could boast.

Roosevelt's time on the American frontier also laid important foundations for his values of protecting habitats and wildlife for future generations. Books he wrote highlighted not only his hunting triumphs, but the joy and fascination of a man captivated by the beauty of the natural world. These attitudes would lead to his later presidential legacy of conservation in the creation of hundreds of national forests, monuments and wildlife reserves.

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Do Your Homework

National parks are increasingly seen as valuable educational resources for people of all ages. Leading an effective, educational field trip to your national park is not something which happens just by bringing your students to the park; it requires a great deal of work and planning. To ensure your students are both learning and having fun, while behaving responsibly in their national park, you have to do your homework!

Before leading a field trip to Theodore Roosevelt National Park, take time before the big day and come explore the park on your own. Talk with park staff about what your goals are. Hike the trails you might take your group to, and consider where you will be able to have discussions or activities. Attend a ranger program in the summer to build your knowledge of the park. Becoming more familiar with the park will give you the confidence to lead a field trip. It will also help you plan logistics, such as travel time and stopping places. But be warned: exposure to national parks may reduce stress levels and increase bodily and spiritual health!

Fee Waiver

Most education groups are eligible for a fee waiver. Please submit waivers at least **two weeks prior** to your field trip. Find the waiver on our home page (link on the right side), or search for information on Fees & Passes: www.nps.gov/thro

Points of Contact

Call the main park number and staff will direct you to the appropriate place or person. You can also email the park. Our Chief of Interpretation and Education directs our educational and general public programming. If you are experiencing an emergency while in the park, 911 is the best number to call.

- Main park number: 701.623.4466
- Park email: thro_interpretation@nps.gov
- Chief of Interpretation and Education: 701.623.4730 x1411

Set Expectations

A field trip is often a big event for young students, and they can easily forget that there are still rules to follow, even though they are not "in school." Before coming to the park, they should understand the basic significance of national parks, and what is acceptable behavior. One goal of exposing your students to a national park is to foster stewardship in our younger generations. If you are bringing other chaperons, be sure they too understand what is expected of them. Page 5 of this guide details the general rules for visiting the park.

Utilize Our Resources

The staff of Theodore Roosevelt National Park is here to help! In person, on the phone, or through e-mail, do not hesitate to contact us with questions about the park or bringing a group to visit.

Our education resources are expanding, but do not limit yourself only to what Theodore Roosevelt National Park provides. The National Park Service has an extensive collection of educational resources which are available online. You can access these resources through the teacher's website: www.nps.gov/teachers/index.htm

From this website you can search for lesson plans by subject, grade level or curriculum standard. You can also find distance learning programs, which allow your students to visit park sites around the country without ever leaving the classroom!

Call a Ranger

Although this guide is designed for you to plan and lead your own field trip, the park may be able to offer a ranger-led program. Depending on our staff, we may be able to offer an in-park ranger program. We may also be able to come to your school for a special session of ranger-led activities in the classroom.

At times the park hosts special events, most notably our Dakota Nights Astronomy Festival in September. We send out periodic emails to notify local educators about events and developments related to our education program. If you would like to be included in these notifications, simply email or call the park and provide us with your contact information.

Get Involved

Working at the park is a great way to learn! Contact the Chief of Interpretation and Education if you are interested in volunteering for the National Park Service. Educators are also encouraged to sign up for our Teacher-Ranger-Teacher (TRT) program; this summer program is a paid position that allows teachers to work with park staff to develop education resources to bring back to their classroom. Look for the "Professional Development" page in the "For Teachers" section of our park website to learn more about the TRT program and find the application form.

Teacher Resource Bin

Sometimes teachers need a few extra ideas or materials to complete their field trip experience. The park offers a resource bin which provides a multitude of materials and activity ideas. These bins can be checked out from the visitor center when you arrive at the park. Yours to use for the day, the resource bin includes:

- Field guides on plants, animals and geology
- Writing materials (pencils, paper, clipboards)
- Rock samples and bison hide
- Outdoor activities for kids (and materials)
- Binoculars and more!

Supplies are limited, so call ahead if you are interested in checking out the Resource Bin for the day of your field trip.

Take a Virtual Tour

Our most popular educational resource is the Maltese Cross Cabin. The park produced a 15-minute educational video entitled "Finding Roosevelt." The video is a great pre-site tool you can access in the classroom before your visit to the park. You can find this video on our website or the park's YouTube page. Our website includes an associated assessment activity to test what your students learned after watching the video.

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Our Park Association

The Theodore Roosevelt Nature and History Association is a non-profit organization which runs the bookstore and gift shop for the park and several other National Park Service sites in North Dakota. They offer valuable books and resources you can use for research or education. An online catalog is available to browse products and help you to purchase materials. In addition to supporting the park through book sales, they also host several annual events including a bird walk and our photo contest. Visit the website for more information: http://www.trnha.org/

Other Related Resources

As one of our most popular presidents, much has been researched and written about Theodore Roosevelt. Listed here are links to several websites and organizations which can help you research more about Roosevelt, his time in the Badlands, and his political contributions and legacy.

The Theodore Roosevelt Center at Dickinson State University has a very comprehensive digital collection of images and documents, including letters from Roosevelt and pictures of his time in the Dakota Territory.
http://www.theodorerooseveltcenter.org/

Much of what the TR Center has comes from the Harvard College Library, and more background information about Roosevelt and the historical resources available to the public can be found there.
http://hcl.harvard.edu/libraries/houghton/collections/roosevelt.cfm

As a boy, TR founded his own Roosevelt Museum of Natural History (in his bedroom). The act was in emulation of his father, who was on the founding board of the American Museum of Natural History. Today, the AMNH has a web page dedicated to Theodore Roosevelt, with videos, articles, and details on their exhibitions.
http://www.amnh.org/explore/science-topics/theodore-roosevelt

Theodore Roosevelt Park Sites

There are a total of six sites managed by the National Park Service that are dedicated, in whole or part, to Theodore Roosevelt. If you are teaching a unit about Roosevelt's contributions, these park sites can provide valuable insight and resources for learning about other portions of his life.

Theodore Roosevelt Birthplace - explore the childhood home of TR, and learn about the interests and influences of a young boy who would one day become our nation's leader.
http://www.nps.gov/thbi

Sagamore Hill - discover the "Summer White House" of our 26th president, and explore the home of Roosevelt after his Badlands experiences.
http://www.nps.gov/sahi

Theodore Roosevelt Inaugural - while on a hunting trip as Vice President, Roosevelt received word that President McKinley had been shot. Less than a week later, Roosevelt was sworn in as president with an improvised ceremony near Buffalo, NY.
http://www.nps.gov/thri

Theodore Roosevelt Island - created in the 1930s to honor our Conservationist President, this small island in Washington, D.C. offers a glimpse into the wild ecosystem which existed before our nation's capital was created.
http://www.nps.gov/this

Mount Rushmore - one of the most iconic monuments in the country, this site honors the legacy of some of our greatest leaders.
http://www.nps.gov/moru

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