

# DRY CREEK PETRIFIED TREE ENVIRONMENTAL EDUCATION AREA



BUFFALO, WY

## WELCOME



modern gars, and primitive mammals and birds. As you explore this area, you will learn about early vegetation and the formation of coal, scoria, petrified trees, and other indicators of the past, as well as how the uplifting of the Bighorns helped create the prairie ecosystem you see today.

### Common Plants at This Site

The BLM welcomes you to this environmental education area. As you travel around the 0.75 mile loop, you will also travel back in time to the geological era of the early Eocene. Sixty million years ago, this area was very different from what you see today. Huge swamps filled the wide, flat plain between the Bighorn Mountains and the Black Hills. Giant trees grew in a marshy area somewhat like the Okefenokee Swamp in southern Georgia. The prehistoric ecosystem was necessary for the development of coal, an important energy resource today. The area was shaded with woodlands and mossy glades, and there may have been turtles, crocodiles, large fish similar to



Silvery Lupine



Wyoming Big Sage



Common Juniper



Plains Prickly-Pear Cactus



Longleaf Arnica



Western Salsify

Note: Collection of petrified wood at this site is prohibited.

## STATION ONE

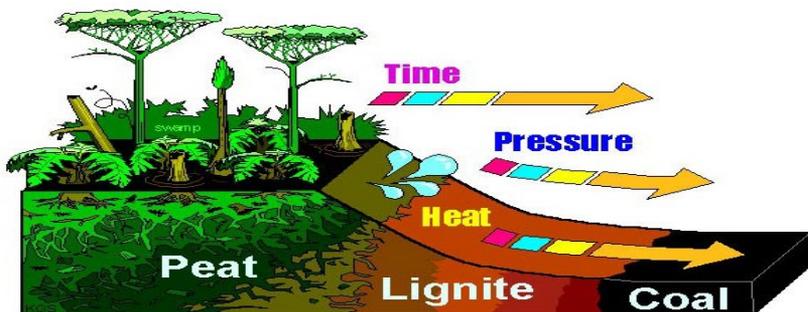
Clinker (locally called scoria) is a type of natural brick formed from shale or sandstone that has been fired when coal seams caught on fire and burned back into the ground. True scoria is a volcanic rock, unlike the coal clinker you see at Petrified Tree. However, most Wyomingites have adopted the term “scoria” for the red rocks, which is used for road bases, gravel, and construction material. The red color is produced by iron oxides in the rock. Coal forms slowly over great periods of time. The coal beds in the area originally accumulated as peat deposits that formed from plant debris such as dead leaves, stems, branches, and roots. The peat beds were likely buried when a nearby river flooded, covering the area with sand and mud. The resulting pressure of being buried by hundreds of feet of sedimentation over millions of years caused the peat to gradually change into coal.

The Powder River Basin in Wyoming



and Montana contains an estimated 800 billion tons of coal. Coal seam fires were documented in the region by the Lewis and Clark expedition (1804-1806) and are estimated to have occurred for at least the past 3 million years.

As erosion and uplifting changed the earth's surface, many coal seams were exposed to the air and caught fire. As the coal seams burned back into the hillsides, the intense heat changed the normally soft brown and grey rocks to a hard red material.



## STATION TWO



Okefenokee Swamp, GA

The vegetation and climate of the ancient swamps was much like that of swamps today in the southern United States. The dominant plants were the towering *Metasequoia* trees, which stood over 100 feet tall. There may have been shrubs similar to modern

alders and trees such as birches, hickory, walnut, and juniper. Grasses did not yet exist when the forest grew here, but a variety of ferns existed, and some fossils are preserved in nearby hillsides. You will begin to see remnants of the trees at station 3.



*Metasequoias* were believed to be extinct until the *Metasequoias glyptostroboides* or Dawn Redwood was rediscovered in China in the 1940s

## STATION THREE

Trees are petrified by a very gradual change in their chemical composition. Petrified wood is the result of a tree having turned completely into stone by the process of permineralization. All the organic materials have been replaced with minerals (mostly a silicate, such as quartz), while retaining the original structure of the wood.

Unlike other types of fossils which are typically impressions of the original object, petrified wood is a 3D representation of the original organic material. The process occurs when wood becomes buried under sediment and initially is preserved due to a lack of oxygen which inhibits aerobic decomposition.

A flooding river likely brought the sand and mud that buried the trees. Instead of decomposing, they gradually became soaked with water from the surrounding muddy sediments, which carried dissolved minerals into the tree trunks.

Please walk carefully through the specimens you see here to ensure their continued presence for future visitors.

## STATION FOUR

Trees continually add a new layer of wood to their trunks just beneath the bark.



Visible rings result from the change in growth speed of a tree through the seasons of the year.

The rings are more visible in temper-

ate zones, where the seasons differ more markedly.

Because each ring represents one year's growth, we can estimate that these petrified trees were 800 to 1,000 years old when the petrification process began.

Notice that many of these trees have wide inner rings, but the rings near the outside of the trunk are narrower. This progressive narrowing of rings indicates the onset of an unfavorable environment for trees that eventually led to the elimination of forests in this area, paving the way for the plains ecosystem we see today.

## STATION FIVE



Exposed Coal Seam

The coal that formed these red-capped buttes was once buried beneath layers of sand and silt. Over time, erosion uncovered the coal layers and exposed them to the air so that they could catch fire. Under certain conditions, coal can self-ignite. In other cases, wildfires from lightning strikes or human activity may ignite

coal that is close to the surface. Coal seam fires will naturally extinguish when the fuel source of unburned coal has been completely consumed or when oxygen can no longer reach the underground fire.



The natural processes that produced clinker (or scoria) are similar to the artificial processes used in firing brick. It is a mystery why peat deposits turned to coal, while the trees that helped produce peat turned to stone.

## STATION SIX

The trees at this site are preserved primarily as stumps and branchless trunks, likely because the trees were so tall and old that their trunks were bare even when they were alive. They likely had spreading crowns of branches far above the ground, just as modern cypress trees do.



Cypress Tree

A flooding river may have destroyed the trees, burying the roots and lower parts of the trunk in sand and mud. Then the branches died and decayed without leaving a trace.

About 70 million years

ago, uplifting began. Over millions of years, the earth's surface changed in eastern Wyoming, with mountain ranges being gradually lifted above the surrounding earth. As the land surface throughout the Great Plains rose, the climate became cooler and drier. When the Bighorn Mountains gradually appeared west of the swamps, a rain shadow was produced and rainfall decreased on the leeward side. The result is that the swamps were deprived of the moisture needed to support life. Over time, the great swamps were covered by rock and other debris carried down from higher elevations.

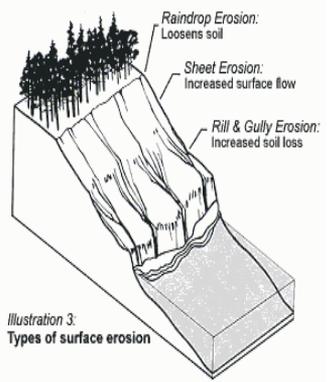


Illustration 3:  
Types of surface erosion

The mountain building forces resulted from changes which occurred deep within the earth. The forces are fairly quiet near the Bighorns now, though they are still active farther west where they cause earthquakes near Yellowstone National Park.

The petrified trees were exposed very gradually as erosion slowly removed the sand and rock that had covered them. While this site highlights and preserves a concentration of tree specimens, there are many other examples of petrified wood throughout the region.

## STATION SEVEN

The Bighorn Mountains were formed when a movement deep within the earth's crust caused an uplift. When the trees of the petrified forest were alive, the mountains were still partially covered with layers of limestone and other rock. The mountains were probably smaller than they are now, and they may have had rounded tops rather than jagged peaks produced by granite. The Bighorn Mountains probably have stopped rising, but erosion continues, constantly removing the comparatively soft sediments that lie over the granite.



Western Hog-nosed Snake

You might see some recognizable wildlife along the trail.

Common reptiles include short-horned lizards, bull snakes,

hog-nosed snakes, and the venomous Prairie Rattlesnake.

Respect wildlife by giving them a wide berth.



Short-horned Lizard



Bull Snake



Prairie Rattlesnake

The site is an important area to the Greater Sage-grouse. Bald eagles frequent this area in winter months, and sage thrashers and meadowlarks are common in summer.

Meadowlark



Sage Thrasher



Greater Sage-grouse



Bald Eagle



# STATION EIGHT

Erosion has removed the sand that filled the trunk of this petrified tree after the tree was buried. Many other trees are exposed in this area, and it seems likely that more trees may be buried deep beneath the surrounding hills. The elevation of this area today is between 4,500 and 4,600 feet above sea level. Temperature extremes range from 40 degrees (F) below zero in January and February to 106 degrees in July and August.

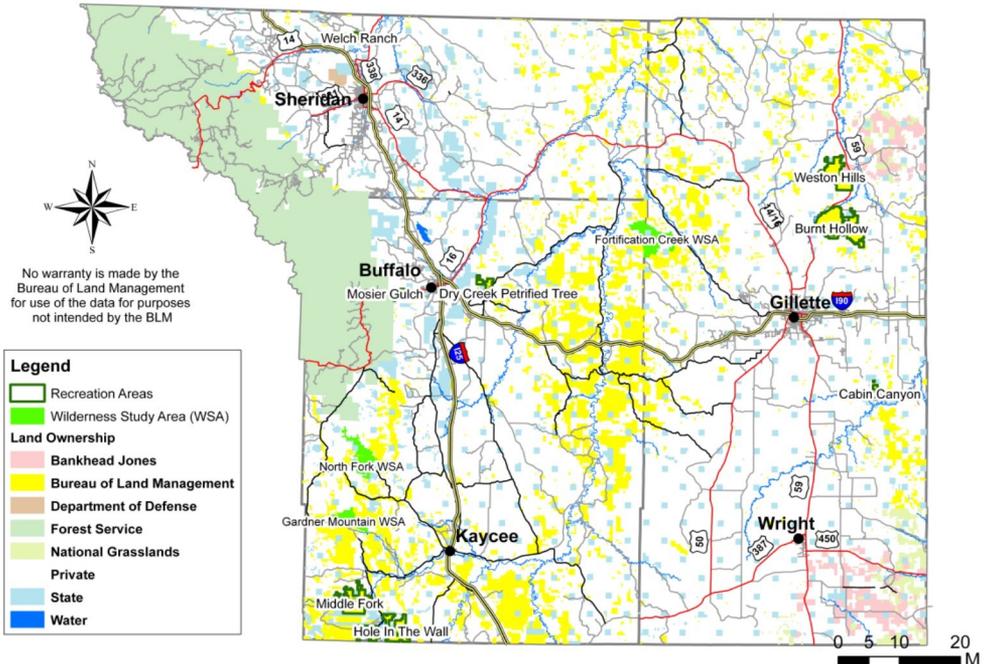
The weather can change swiftly and violently. The average annual precipitation is 13 inches. Most of the

moisture is in the form of rain, which falls frequently in May and June, and periodically in late summer and early autumn. Snow accumulates in the winter months. As you can imagine, this site is no longer suitable habitat for crocodiles!

We hope you enjoyed your visit!



The Buffalo Field Office has additional opportunities for recreation in the Powder River Basin.



While visiting the site, please practice Leave No Trace ethics.



## Leave Natural Objects and Cultural Artifacts

Natural objects of beauty or interest such as petrified wood or colored rocks add to the experience at this site and should be left so others can experience a sense of discovery.

The same ethic is applicable to cultural artifacts found on public land. Cultural artifacts are protected by the Archaeological Resources Protection Act. It is illegal to remove or disturb archeological sites, historic sites, or artifacts such as pot sherds, arrowheads, structures, and even antique bottles found on public lands.



The Buffalo Field Office has other opportunities for outdoor recreation on public lands in northeast Wyoming. For more information, please go to <https://www.blm.gov/visit>

Please return this interpretive guide to the trail register prior to departing the area. Thanks!

Hard copies of these materials are available by contacting:

Bureau of Land Management  
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(307) 684-1100