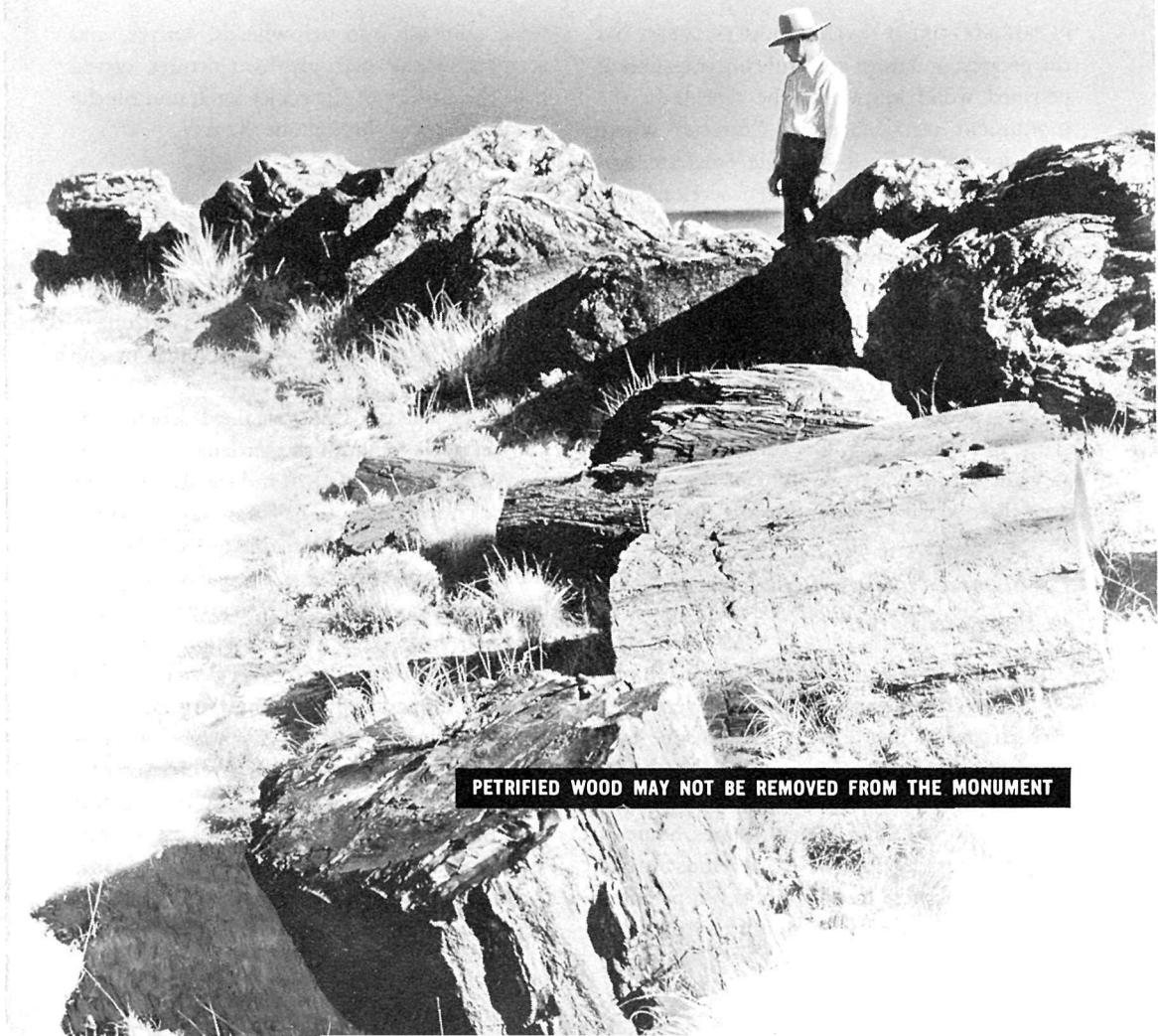


Petrified Forest

NATIONAL MONUMENT • ARIZONA



PETRIFIED WOOD MAY NOT BE REMOVED FROM THE MONUMENT

Petrified Forest



NATIONAL MONUMENT

The National Park System, of which this area is a unit, is dedicated to conserving the scenic, scientific, and historic heritage of the United States for the benefit and enjoyment of its people.

PETRIFIED FOREST NATIONAL MONUMENT has the greatest and most colorful concentration of petrified wood known in the world. In the monument are six separate "forests" where giant logs of agatized wood lie prostrate, surrounded by numerous broken sections and smaller chips and fragments.

The area, containing 85,304 acres of Federal lands, is a part of the Painted Desert of northern Arizona, a region of banded rocks of many hues carved by wind and rain into a fantastic landscape. Here and there beds of shale contain perfectly preserved fossil leaves of plants of a remote age. Occasionally the bones of giant reptiles and amphibians are washed from their burial places in the deposits.

Prehistoric Indians Lived in Petrified Forest

The ruins of pueblos built by Indians in pre-Columbian times, from 800 to 1,400 years ago, are scattered on nearly every mesa throughout the monument. Low mounds, strewn with blocks of sandstone and bits of broken pottery, mark the sites of these ancient homes. Some of the dwellings, such as the Agate House in the Third Forest, were built of blocks of petrified wood, and smaller fragments of this material

were chipped into arrowheads, knives, and scrapers. Many petroglyphs (pictures carved into the surface of the rock) are found on the sandstone rocks throughout the area.

History

Apparently the first man to report the "stone trees" was Lieutenant Sitgreaves, an Army officer who explored parts of northern Arizona in 1851, soon after Arizona was acquired by the United States.

The petrified forests remained largely unknown, however, until the settlement of northern Arizona began in 1878 and the Atlantic and Pacific (now the Santa Fe) Railway was completed across northern Arizona in 1883. During the following years, the existence of the petrified forests was threatened by souvenir hunters, gem collectors, commercial jewelers, and abrasive manufacturers. Entire logs were blasted to obtain the quartz and amethyst crystals often found within the logs, and much agate was carried away for making jewelry. The erection of a stamp mill near the forests to crush the petrified logs into abrasives offered the most serious threat. Alarmed, the citizens of Arizona, through their territorial legislature, petitioned Congress to make the area a national reserve

"so that future generations might enjoy its beauties, and study one of the most curious results of nature's forces."

Following an investigation by Lester F. Ward, of the United States Geological Survey, Petrified Forest National Monument was established by Presidential proclamation on December 8, 1906, under authority of the Act for the Preservation of American Antiquities.

The Geologic Story

The Forests. About 160 million years ago, in Triassic time, northern Arizona was probably a lowland where shifting streams spread sand and mud over the plains. Scientists believe that the growing forests were upstream, possibly as much as a hundred miles west and southwest of the present petrified forests. The principal tree resembled our native pines, but was more closely related to the Araucarian pines of South America and Australia. Remains of two other kinds of primitive trees are also occasionally found.

The Trees Were Buried. Natural processes, sometimes hastened by destructive fires and ravages of insects, are believed to have killed the trees. Certainly, many of them decayed on the ground, but others fell into streams and came to rest in bays or on sand bars where rapid burial by mud and sand prevented their decay. The deposits in which these trees were buried eventually turned to the sandstones and shales now called the Chinle formation. These were buried at least 3,000 feet beneath later layers of sand and silt spread by shallow seas.

The Logs Petrified. The sediments in which the logs were buried contained a large amount of volcanic ash, rich in silica. This silica was picked up by ground water, carried into the wood, and deposited in the cell tissue. The mineral filled the wood solidly, forming the present petrified log. However, part of the original organic matter remains. The color patterns were caused by oxides of iron and manganese, the predominant type known as

agate. Cavities in the logs were often filled or lined with quartz crystals.

How the Forest Was Brought to Light. Since the forest was buried there have been several periods of great mountain making. Forces from deep in the earth thrust the Rockies and Sierras upward several thousand feet, and the land between was lifted far above its former position near sea level. As a result of this great mountain growth, certain areas became arid and desertlike; soon wind and rain started wearing down the great deposits that covered this region. Large river systems carried away the loose mud, sand, and gravel which finally found its way to the sea. Thus the sediments that once covered the forest were removed. Finally the layers in which the logs were buried were cut by canyons and ravines, revealing the great petrified logs and the many bands of colored rock that make up the Painted Desert. As the logs wash from the hillsides, they break and accumulate in piles at the base of the cliffs. Only a small portion of the petrified forests is now exposed, for logs are scattered below the surface of the ground to a depth of about 300 feet.

Broken Log Sections. Rhythmic vibrations of earthquakes during the period of uplift of the land are believed to have produced fine cracks at more or less regular intervals across the petrified logs. As erosion of the softer material around the logs took place at the surface of the land, the exposed cracks widened, separating the logs into sections.

The Painted Desert. The badlands of the Petrified Forest areas and the Painted Desert get their color from the ancient volcanic deposits of that region, and the surface forms are typical of desert erosion.

The material from which the badlands were sculptured originally was deposited layer upon layer as volcanic ash. The decomposition of the ash which released silica for petrification converted the ash into claylike rock, called bentonite. When pure, the bentonite is nearly white, but in the Painted Desert it is stained



Formations in the Third Forest.

many shades of red, orange, maroon, blue, purple, and yellow by iron minerals that also came from volcanic ash.

Bentonitic beds in arid or semiarid regions erode into badlands. The bentonite absorbs water like a sponge, swells, and disintegrates into a fine mud. As a result, the torrential summer rains that fall in northern Arizona rapidly cut the banded, bentonitic beds into sharp, conical hills, turreted ridges, and sharp, interbranching canyons and ravines. When dry, the bentonite is hard and strong, thus preserving these intricate badlands forms during the long

periods between rains. Locally, a hard sandstone caprock may prevent rapid erosion of the shales beneath to form an abrupt-sided, table-topped butte or mesa. The resistant capping of the rim of the Painted Desert is composed of ancient volcanic rock.

Interpretive Service

You are invited to see the Rainbow Forest Museum. Its exhibits include many outstanding examples of polished petrified wood, fossils,

and minerals; charts explaining the formation of the petrified forests and the badlands; and a diorama. Other exhibits may be seen at the Painted Desert Museum, which is open during the summer.

During the summer, short talks are given periodically in the Rainbow Forest Museum; and, as circumstances permit, guided tours through the Rainbow Forest are conducted by park ranger naturalists.

All of these services are free of charge.

Travel Information

Excellent paved approach roads make Petrified Forest National Monument easily accessible by car, and it can be visited throughout the year. U. S. 66, crossing the area near the Painted Desert, is the approach from the east. Travelers from the southeast, south, and west enter from U. S. 260. The monument road connects these two main highways and leads through the more interesting parts of the area. This road through the monument is closed to through travel at night.

Travelers by rail must obtain privately operated cars in Gallup, N. Mex., and Holbrook and Winslow, Ariz., for tours through the monument as no scheduled tours are available.

Accommodations and Supplies

At the Rainbow Forest, a small picnic ground, equipped with table, shade, and water supply, is available for free use in daytime only. There are no camping facilities.

The nearest towns having cabin, hotel, store, and garage facilities are Holbrook, Ariz., 20 miles west; Gallup, N. Mex., 92 miles east; and St. Johns, Ariz., 42 miles southeast. Distances are from monument headquarters.

Meals, gasoline, and souvenirs only may be obtained at the Painted Desert Inn and at the Rainbow Forest Lodge.

Administration

Petrified Forest National Monument is administered by the National Park Service of the United States Department of the Interior. A superintendent, whose address is Holbrook, Ariz., is in immediate charge.

Self-guiding Tour

From U. S. 66—Read down
From U. S. 260—Read up

Painted Desert Rim Drive. Take road from U. S. 66 to rim. Distance back to U. S. 66, via rim, about 4 miles. Beautiful view of Painted Desert. Museum of Indian Arts and Crafts in basement of Painted Desert Inn.

Painted Desert. Erosion cutting across the many colored beds of shale and sandstone produced the "Painted Desert."

Puerco River Ranger Station. To enter monument, secure automobile or motorcycle permit. Visit Puerco Indian Ruin back of ranger station. Ruin indicates 150 to 160 rooms. Built 800 to 900 years ago. To leave monument, get clearance.

Newspaper Rock. Side road ¼ mile. Fine trail—12 to 15 minutes. Remarkable prehistoric Indian "writings" (petroglyphs) probably 800 to 900 years old. Made by chipping through outer dark sandstone surface with sharp tool, probably of petrified wood. The many interesting figures, symbolic designs, and characters have never been interpreted. Please do not deface them.

Blue Forest Drive. Good graveled road—3 miles to parking area. Fine panoramic view of Blue Forest badlands and Puerco River Valley. Conglomerate capped mesa. Head of Blue Forest Loop Trail.

Blue Forest Loop Trail. Gravel trail—1 mile long—50 to 60 minutes. Leads down into Blue Forest badlands. Logs on three levels. The only forest with pink logs. Remarkable "chip" piles.



Agate Bridge.

Returns to starting point. See wayside exhibit at start.

Agate Bridge Trail. 5 to 10 minutes. Petrified log, 111 feet long, forms natural bridge; span about 40 feet. Erosion of sandstone by rain water produced this bridge. Pedestal Log a short distance south.

First Forest. Fine side road—8 to 10 minutes. Highly colored, broken logs very abundant, eroding from conglomerate bed that caps mesa.

Second Forest. Good trail—20 to 25 minutes. Peculiar white, silicified logs; logs are fire scarred; carbonized material present. Hollow logs show crystals in place.

Third Forest and Agate House. Paved trail—25 to 40 minutes. Finest long log area—some 150 to 160 feet. Panorama Knoll gives

good view. Agate House side trail to prehistoric Indian dwelling partially restored; built of petrified wood 800 to 900 years ago.

Rainbow Forest. Start from museum on all-paved trail—15 to 20 minutes. Logs show beautiful bands of color. Old Faithful, one of the largest logs, at top of trail. Mather Memorial on side trail.

Rainbow Forest Museum. Charts and exhibits tell the complete story of the Petrified Forest. They include beautiful polished sections of agatized wood, fossil reptiles, and amphibian skulls, bones, and teeth.

U. S. 260 Ranger Station. To enter monument, secure automobile or motorcycle permit. Drive carefully. To leave monument, get clearance and information on roads.

Please help to maintain and protect Petrified Forest National Monument by refraining from destroying or removing specimens of petrified wood (no matter how small the piece) or defacing or marking ruins, pictographs, petroglyphs, or other works of prehistoric man. If each of the hundreds of thousands of yearly visitors took pieces of petrified wood, there would soon be none left. Once removed, it is gone forever—it cannot be replaced.

Your cooperation in observing the above will make it unnecessary to impose penalties of fines or imprisonment, or both, as provided for under the laws of the United States Government for the protection of Petrified Forest National Monument.

You may purchase petrified wood from the monument concessioner, who gets his supply from dealers handling wood obtained from private lands outside of the monument.

The following items, which through their observance will tend to make your trip and that of your neighbors more enjoyable, are listed for your guidance:

The monument is a sanctuary for all living things. Please do not molest the birds or animals or pick wildflowers.

Pets may be brought into the monument only on leash, crated, or otherwise under physical restrictive control.

Picnicking is permitted at the headquarters picnic area only.

Unless adequately sealed, cased, broken down, or otherwise packed to prevent their use while in the monument, firearms are prohibited except upon written permission from the superintendent.

Professional photographers using motion picture cameras must obtain a permit from the superintendent.

All accidents should be reported to the nearest ranger station.

Please observe posted speed limits, drive with caution, and heed all traffic signs.

Lost and found articles should be reported to the nearest ranger station.

There is an annual fee of \$1, and a 15-day fee of 50 cents, for each automobile and motorcycle. Permits must be shown to leave or reenter the monument. During the valid period of all 15-day permits, the cost thereof may be applied toward the purchase of a similar annual permit. All fees are deposited in the United States Treasury and offset, in part, appropriations made for operating the monument.

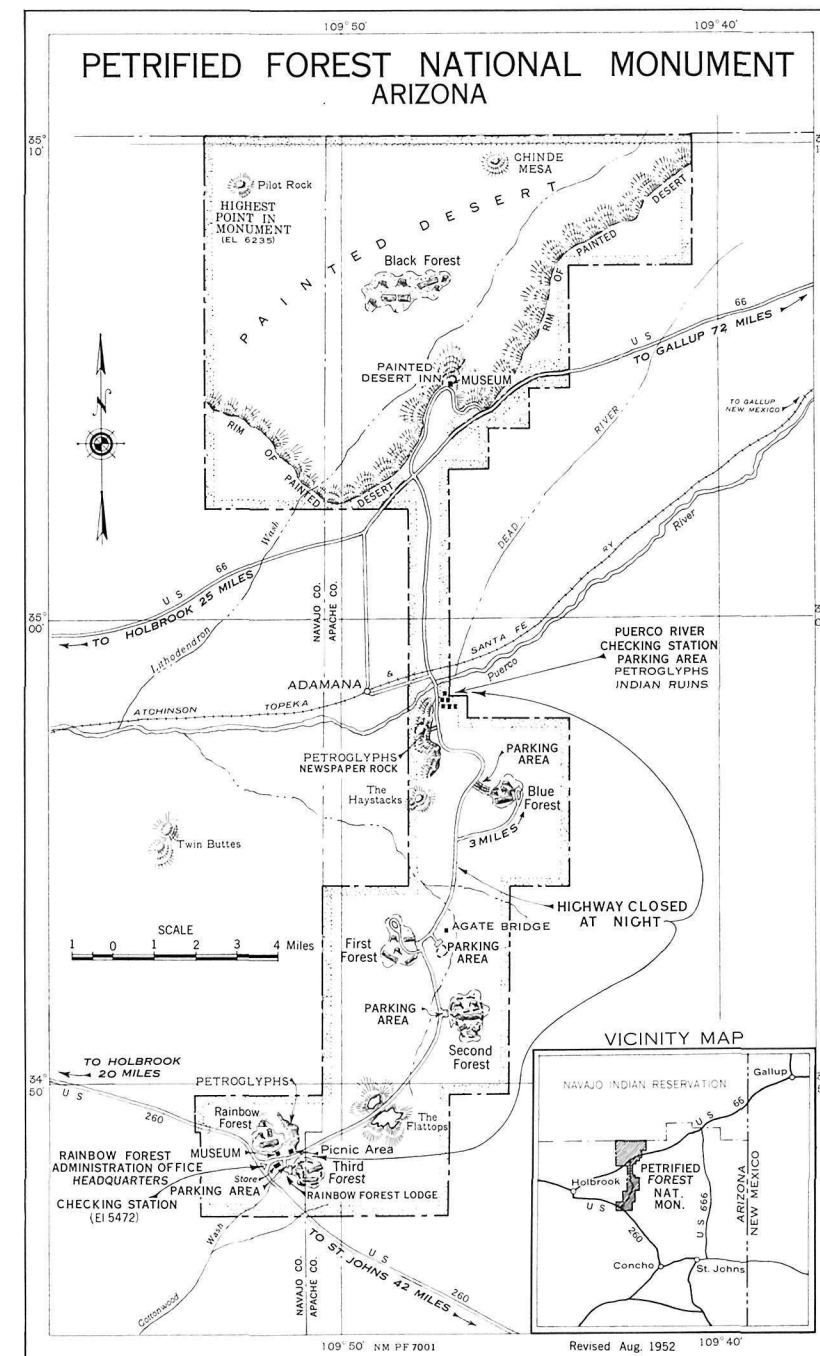
The monument road between the Rainbow Forest and the Painted Desert is closed to through travel at night.

Park rangers are here to assist you as well as to protect the monument area.

If you need information, or are in any difficulty, see a park ranger.



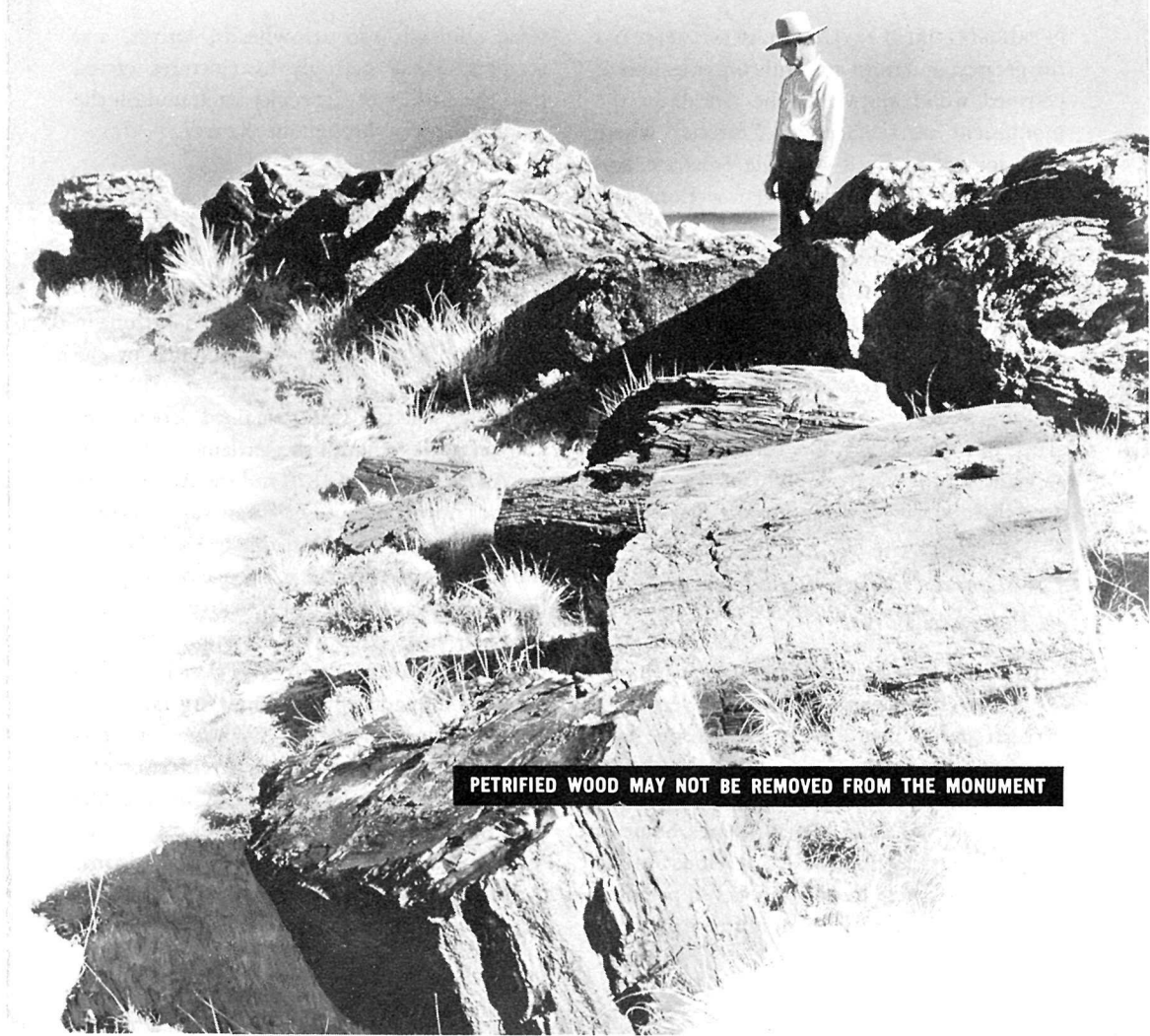
UNITED STATES DEPARTMENT OF THE INTERIOR
Douglas McKay, Secretary
NATIONAL PARK SERVICE, Conrad L. Wirth, Director



COVER: Petrified logs in the Rainbow Forest.

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