

Petrified Forest

National Park Service
U.S. Department of the Interior



Petrified Forest National Park
Petrified Forest, Arizona

An Older Student's Guide

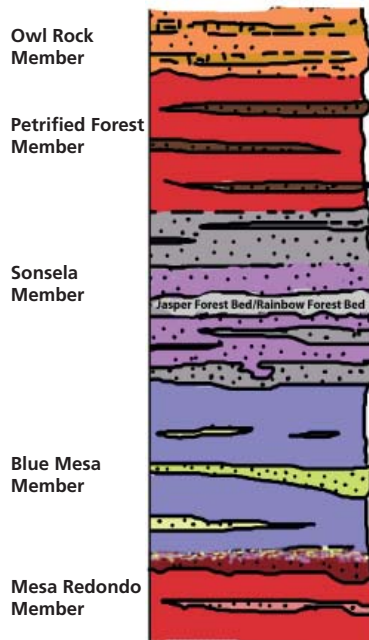


Petrified Forest National Park is a globally significant exposure of fossils from the Triassic Period more than 200 million years ago. The paleontological and stratigraphic information exposed on park land is an invaluable source for the study of these ancient organisms and their environment.

Petrified Forest also contains a functioning remnant of an increasingly rare shortgrass prairie ecosystem, and archeological sites representing a continuum of human use and occupation from 10,000 years ago to the present.

Geological Formations

The Late Triassic Chinle Formation
Exposed in Petrified Forest National Park



The Chinle Formation:

Sedimentary rocks laid down during Late Triassic Epoch (over 200 million years ago) make up the majority of the landforms in the park. The Chinle consists mostly of bentonite clay, mudstones, siltstones, and sandstones. The Chinle Formation is

The Bidahochi Formation:

A section of the Bidahochi Formation outcrops at the north end of the park. Composition consists of basaltic lava and sedimentary rock (mudstones and siltstones) which were laid down about 3-6 million years ago. Lava flows erupted into and onto sedimentary rock in a freshwater lake environment to make up the Bidahochi Formation. This formation sits directly on top of the Chinle Formation in the park.

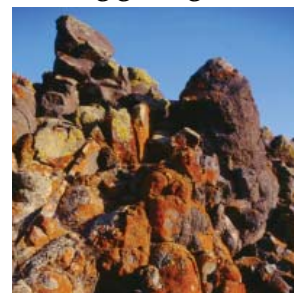
The Chinle/Bidahochi interface represents a substantial gap in the geologic record

Recent Deposits (Quaternary):

Surface deposits of windblown sand and alluvium (deposited by flowing water) create extensive layers on the mesas, valleys and plateaus of the park. These soil deposits support the shortgrass prairie that covers much of the area. Scattered parts in the park also contain sand dune deposits. These formations range in age from 500,000 years old to the present.

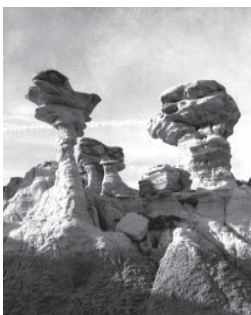
subdivided into five members (main layers, oldest to youngest): Mesa Redondo, Blue Mesa, Sonsela, Petrified Forest, and Owl Rock Members. All divisions are based on relative age, composition, and the fossils found within.

called an unconformity. Erosion, uplift, or other interruptions of deposition caused this geologic gap. At Petrified Forest National Park the 225 million year old Chinle Formation is capped by the 3-6 million year old Bidahochi layers. This gap represents about 200 million years of missing geologic history.



Bidahochi Formation

Recent deposits along the Puerco River



Common Rock Types

Sedimentary Rocks: Mudstones, siltstones, sandstones, shales, conglomerates
Igneous Rock: Basalt

Common Mineral Types

Quartz (silicon dioxide) - numerous varieties and most common mineral
Iron ores (ferrous and ferric forms) - limonite and hematite predominate
Selenite (hydrated calcium sulfate) - crystalline gypsum
Calcite (calcium carbonate) - several crystalline and massive varieties



Petrified Wood Composition and Color
Silicon dioxide is a common component of fossilization, including the petrification of wood. The brilliant colors in the logs come mainly from three minerals: pure quartz is white. Carbonized organic compounds and

residues can be black, tan and brown. Iron ores (hematite and goethite in ferric and ferrous states) range from yellow through orange, red, brown, to black. Manganese oxides can be blue, purple, and black.

Park Issues and Concerns



Resource Theft:

Everything in a national park is referred to as resources, including the plants, animals, geological formations, archeological artifacts, even the air. Resource theft is a continuing problem for the park. Each year several tons of petrified wood is stolen. Many areas have been stripped clean of small, easily removed pieces. Visitors also steal other minerals and cultural artifacts (pottery shards, arrowheads, e.g.) from park sites. This cheats future visitors of the

chance to experience their heritage. Park staff work to slow the theft of park resources through strict enforcement of park regulations via fines or arrest. Staff also educate the visiting public about the significance of the environment and the irreplaceable information it contains. Park publications, displays and exhibits are designed to increase visitor awareness of these resources, leading to stewardship and the desire to protect Petrified Forest and all national parks sites and future generations.



Environmental:

The park is dominated by a functioning grassland environment. Over a thousand species of plants and animals make their home within park boundaries. Residents include American pronghorn, Gunnison's prairie dog, mariposa lily, Hopi rattlesnake, tarantula, cliffrose, and golden eagle.

park. Although most of the flora and fauna are not listed as endangered or threatened at this time, the entire shortgrass prairie ecosystem is steadily disappearing from the American landscape.

The park acts as a sanctuary for many reptile and amphibian species, including the milksnake. There are some species of lichen that have been found only inside the

The rapid spread of non-native and invasive species like tamarisk and Russian thistle is becoming a significant problem in the park. Without natural enemies, they often out-compete and displace native species. Most invasive species have been introduced by human activity.

Current Research



Surveys and research are ongoing. As studies are completed the information is made available to the public. Petrified Forest National Park has in-house researchers, including archeologists, geologists, and paleontologists. The park also hosts visiting researchers in other fields such as herpetology. More paleontological material has been found in the park in the last decade than in the prior seventy years. Archeological site surveys and documentation are ongoing

with site identification and monitoring as the current focus. Preservation work on a historic stage station has started. Recent studies have been made on visitor understanding and expectation, making future exhibits and publications more relevant. Research on botany, small mammals and reptile/amphibian surveys has continued. Results may influence future resource management practices. Park staff, in cooperation with other agencies, monitors air quality in the region.



Petrified Forest National Park Resource Management Plan

This plan details how park resources will be managed. By identifying, defining, and programming, the resources are monitored, inventoried, and researched. In addition, strategies for mitigation of theft and damage of park resources are coordinated with enforcement activities.

Primary tasks of the plan are to:

- Preserve park resources.
- Provide for public enjoyment and visitor experiences.

These tasks should be met via:

- Improving baseline resource data through research to help guide future management.
- Addressing resource theft issues and improving protection of resources.
- Addressing potential impacts brought about by development inside and outside the park boundaries.
- Monitoring and protecting air quality and dark skies.
- Improving integration of new information into interpretive programs for the public.
- Defining and developing new techniques and methods of providing interpretation for the public, both in the park and in the global community.