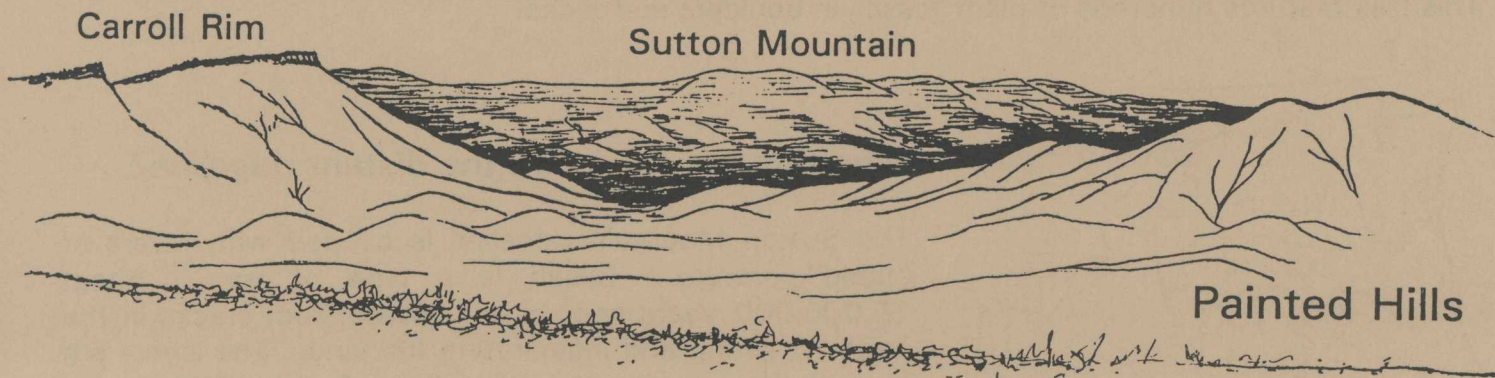


# Painted Hills Viewpoint



You are witness to a still photo of a land in continual change. For millions of years extensive volcanic deposits covered and built up this land. Erosion has since carved into these deposits, resulting in the Painted Hills.

The splendor of these hills have provoked many questions ...

## What are the Painted Hills made of?

The Painted Hills are composed mostly of claystone layers, which include ancient soils and lake beds. The surface of the hills have weathered and softened to clay.

The claystones were formed by several events and processes. Over 30,000,000 years ago, volcanoes from ancestral Cascade Mountains, 100 miles to the west, slowly deposited layer after layer of cooled ash. Plants and animals churned and tilled the surface, and air oxidized the ash. Ground water flowed, leaching and redistributing minerals. Over time, the ashfall became soil, later buried under hundreds of feet of deposits. Compaction, cementation, and recrystallization processes occurred. The original ashfalls were thus changed structurally and chemically, resulting in hard and colorful stone.

## What causes the colors in the Painted Hills?

Aluminum (Al), Silicon (Si), Iron (Fe), Magnesium (Mg), Manganese (Mn), Sodium (Na)  
Calcium (Ca), Phosphorous (P), Titanium (Ti), Potassium (K), Oxygen (O), Hydrogen (H)

The answer is complex. The original ashfall was probably a very light, buff color, comprised primarily of the above elements. Just like ingredients in a recipe, these twelve elements, plus traces of seventeen others, were mixed in a variety of ways. The various mixes produced minerals of different colors that make up the hills. Sometimes the color of one mineral dominates, such as the rust colored layers, rich in iron oxide (Fe & O). A blend of minerals may create a color different from the originals. The yellows are a blend of iron and magnesium oxides. The black "hash-marks" are primarily colored by manganese oxide.

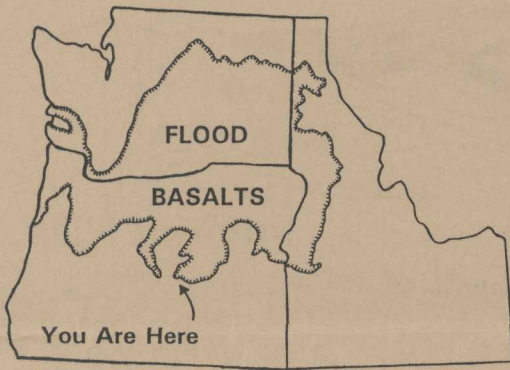
Also, depending on the amount of moisture in and on the hills, light is reflected and absorbed differently. This causes ever-changing tints of red, buff, yellow, and other colors.

## Are there fossils in the Painted Hills?

Distinct, easily recognizable fossils are rarely found in the Painted Hills, although complete fossil leaves are occasionally found in ancient lake deposits interspersed in the hills. Quick burial is an essential step in the preservation of plant and animal remains as fossils. The original ashfalls creating the Painted Hills were infrequent, and most organic remains decayed, were devoured, or dissolved during soil building processes. In comparison, the buff and green claystone exposed under the Carroll Rim crest, and the base of Sutton Mountain, typify rapid accumulations of ashfall. These deposits tend to have more fossils.

## Where can we see fossils?

A small collection of fossils common to this area have been put on display at Leaf Hill Trail (see below). The monument's museum is in the visitor center, located at the Sheep Rock Unit, 45 miles east along Route 26. At the Clarno Unit, a 75 mile drive north of here, is the Trail of the Fossils. This trail features hundreds of plant fossils in boulders and rocks.



## What are the layers on the distant ridgeline?

The Sutton Mountain ridgeline is capped with layers of "flood" basalts. Basalt is a type of lava. About 16,000,000 years ago, basalt flowed from cracks in the earth, covering and incinerating the land. The layers are part of the massive Columbia River Basalts that extend across much of Oregon, Washington, and Idaho.

The rock layer atop Carroll Rim is not basalt but an ignimbrite, or welded tuff. It was formed 28,700,000 years ago when a volcano to the west erupted, hurling hot gases, ash, and debris high into the air. This fiery column then fell to earth and flowed across the surface of the land at high speed, for great distances. The hot materials settled, welding into a glassy, rock layer that was fairly level. Later movements in the earth have tilted the ignimbrite and adjacent layers.

## Why aren't plants growing on the Painted Hills?

The hills are layers of rock with the first few inches of the surface weathered to a clay that has an excellent ability to absorb water and swell. It retains water so well most plants are not able to draw the water from the ground. The clay is also dense, making it difficult for most plants to take root. Some plants succeed. In the spring the crevasses and gullies of the red hills are filled with the bright yellow blossoms of Chaenactis and Bee-Plant.

## Can I get closer to the red hills?

Just over one mile away is the Painted Cove Trail. This 1/4 mile trail allows you to walk among colorful hills. A self-guiding brochure is available there. Make a left as you leave the viewpoint road and follow the signs. A turn-around and parking are provided at the trailhead.

## Are there other nearby trails?

From the viewpoint, the 1/4 mile Overlook Trail gently ascends the ridgeline, providing scenic views of the Painted Hills. Two benches have been provided along the way.

For a birds-eye view of this area try the 3/4 mile Carroll Rim Trail which begins where you entered the viewpoint road. The ascent to the top of Carroll Rim is moderate to strenuous.

Two miles from the viewpoint is a small, buff colored hill that has been the site of continuous scientific study. The gentle, 1/4 mile Leaf Hill Trail will take you to this site, and features fossil exhibits and information. To reach the trailhead make a left as you leave the viewpoint road. A turn-around and parking area are provided.

## There seem to be trails on the colorful exposures!

Hiking on the clay exposures is definitely prohibited. We yield to the deer and antelope, which have created these trails in their journeys across this land.

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