



THE BROKEN TOP LOOP TRAIL GUIDE



The Broken Top Loop Trail provides visitors with an opportunity to hike up, around, and through the freshest lava on the Snake River Plain. Along its 1.8-mile length you can observe most of the volcanic features that make up this unearthly landscape. In hiking this trail, you will be on either loose cinders or rugged lava. Wear sturdy shoes and be ready to climb or descend some moderately steep slopes. If you plan to enter Buffalo Caves, a hard hat is recommended and a flashlight is a necessity.

Please stay on the trail and leave all natural objects where you find them for other visitors to experience.



1

THE GREAT RIFT

Where is the volcano? You're looking at it! This depression is one of a series of deep tears in the earth that are the source of the vast lava field of Craters of the Moon. Broken Top was formed as frothy, molten rock was sprayed high into the air from linear eruptive fissures like this one. As cinders fell back to earth and piled up, they formed this cinder cone. Wind was blowing from the SW at the time of this eruption and blew most of the cinders to the downwind side of the fissure.

2

2 SNAKE RIVER PLAIN

As you look toward the northern horizon, you can see where the lava stops and the foothills of the Pioneer Mountains begin. This is the northern boundary of the huge mass of lava known as the eastern Snake River Plain, which covers more than 7,500 square miles. This also marks the north end of the 52 mile long series of cracks and fissures known as the Great Rift. On November 9, 2000 Presidential Proclamation 7373 expanded Craters of the Moon National Monument to ~750,000 acres protecting almost all of the Great Rift volcanic rift zone and its associated features.



3

3 BIG SINK OVERLOOK

This $\frac{1}{4}$ -mile spur trail leads to a viewing area that overlooks a massive lava flow known as the Blue Dragon. Brilliant blue glass colors the landscape of the flow, and the spiny surface reminded the early explorers of dragon skin. Being ~2,100 years old, the Blue Dragon is one of the youngest lava flows in the CRMO Lava Field. Only the Broken Top Flow, which you will hike over later, is younger. The story of the formation of the Blue Dragon Flow and related volcanic features such as spatter cones, lava tubes, lava ponds and pit craters is told by wayside exhibits at this site.



4

4 CINDERS

The crunchy rocks you have been walking on are cinders. Cinders contain many gas bubbles or vesicles making them very light in weight. Some are light enough to float on water! Thin layers of glass coat the cinders creating prisms that refract and reflect light into millions of micro-rainbows.





5

BIG SOUTHERN BUTTE

To look to the south is to get a feeling for the immensity of Craters of the Moon National Monument and Preserve. The Monument extends nearly to the horizon in every direction. The large peak rising from the plain about 25 miles to the east is Big Southern Butte, which lies outside of the Monument boundary. Even though Big Southern Butte looks like a strato-volcano, it is a massive dome of rhyolite rock. Rhyolite is composed of the same minerals as granite but in lava form. About 300,000 years ago rhyolite lava slowly rose up through the layers of dark basalt and broke through to the surface to form this peak.

6

BOMBS

Watch out for bombs! During the creation of Broken Top globs of molten rock called bombs were thrown out from the fissure. The southern face of Broken Top is covered with thousands of bombs. Some of these bombs weigh well over 100 pounds! There are many types of bombs. "Breadcrust" bombs (left) have an outer crust that cracks and develops like a loaf of bread. Cracks occur when the surface cools quickly while the hot interior continues to expand. "Spindle" bombs (right) form as hot lava spirals through the air, freezing into twisted, bizarre shapes.



7

PRESSURE RIDGE

This elevated structure is called a pressure or flow ridge. Crusts of cooling lava develop on the surface of a lava flow when the hot lava comes in contact with cool air. The crust encapsulates the hot, flowing lava below creating a roof. When the pressure under the roof increases, it forces the crust upward causing it to bend and buckle. The rounded, bulbous projections of lava that escaped from this ridge are known as lava toes. They can form at the edges of a flow where the last of the hot lava oozes out.



8

LAVA TUBES

Buffalo Caves are part of the lava tube system of the Broken Top flow. Crusts of cooling lava develop over rivers of hot, flowing lava similar to the process at STOP 7. The lava river beneath becomes insulated from the cooling air keeping the interior lava hot enough to flow forward. Later, the river of lava drains out from beneath the crust, leaving behind a lava tube. Sections of Buffalo Cave may be entered, however the ceilings are low and collapses have led to closure of part of the cave. Enter using caution. For your safety while exploring this cave, do not go beyond warning signs!



9

BIG CINDER BUTTE

At >700 feet high, Big Cinder is the largest cinder cone in the Monument. A fountain of fire at least 1,500 feet high produced this cinder cone. The steep-sided lava flow immediately in front of you is a feature of the Broken Top flow. A depression in the landscape between here and Big Cinder was filled in by lava creating a lava lake. The surface of the lake cooled and solidified, but lava continued to flow in beneath the crust inflating the flow like a giant inflatable cushion pushing the surface up 15 feet, but the edges remained stuck and were tilted up creating the pressure plateau.

10

PAHOEHOE

You have been hiking across two young pahoehoe lava flows, the Broken Top and the Blue Dragon. In the Hawaiian language, pahoehoe means "ropy" as the feature here illustrates.

Will the lava flow again from the Great Rift? Geologists tell us that the processes that created these flows are likely to generate future events.

We hope you have enjoyed this trail and we thank you for helping us take care of this special place. Please return guide to box at trailhead for others to use.

