

Douglas Fir trees are also prevalent. The Douglas Firs have the classic Christmas tree shape with tighter pine cones. The older ones in this area often have dead tops. Another common tree to this area is the Alligator Juniper. These trees are named for the texture of their bark. They are bushier and grow to be over 1,000 years old. You will also see stands of Gambals Oak. There are a few above the trail on the side of the volcano. Along the side of the trail you will see white barked trees with coin shaped leaves. These are Aspen. In the Fall, the leaves of the Aspen and the Oaks will turn yellow and orange.

14. Volcano Land

If you look off into the distance you will see a number of other volcanoes that make up the El Malpais region. There are 29 volcanoes in this area. From this point you should be able to see around 15 of them. Starting from your right, southwestern side, there is Bandera's twin, Cerro Bandera (the largest, closest one). Moving to the East, the closest ones are: Arizona, Comadre, Americana, Rendaja, Leonides, Hoya De Cibola, Hueto, Lost Woman, Twin Craters, Lava Crater, El Calderon and Candelaria Crater.

15. Cinder Cone Formation

Here you see a cross section of this volcano. This volcano is a cinder cone. The volcano began as the earth started to swell. Eventually a crack broke open and high pressure lava began spraying out. The molten rock hardened in mid air and fell back down to the ground as cinders. As the eruption continued, the cinder cone got larger and larger. What you see here shows the various sized cinders that make up this mountain.

16. Leaching Lava

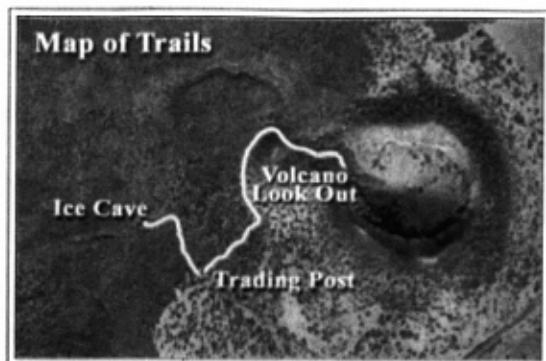
As lava ages, the various elements within the rock leaches out. Elements present in most lava include: oxygen, silicon, iron, aluminum, calcium, magnesium, sodium, sulfur, potassium, titanium and other trace elements. Here you see calcium (white), sodium and sulfur (yellows), and iron (red) leaching out of the rock.

**Do Not Disturb or Pick Up Lava
Plant or Animal Life**

17. Devil's Playground

Below, you see the beginning of the Bandera lava tube system. That is the large canyon that snakes out from the crater. This section of lava flow illustrates how violent this eruption must have been. Early sheep herders called this area "devil's playground." The lava is very sharp, jagged, and makes good shelter for rattlesnakes. It can be treacherous to walk in. Please do not leave the trail.

Bandera Volcano



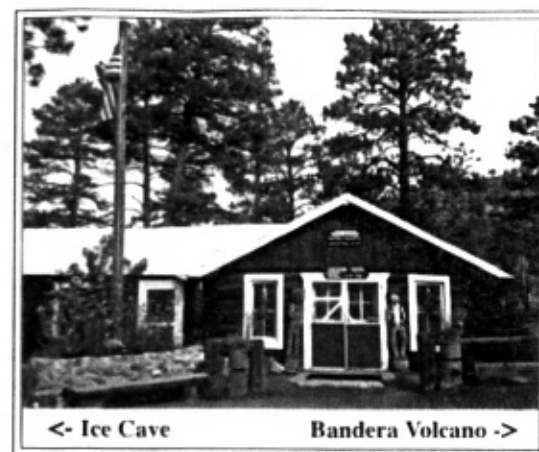
Aerial View Of Bandera Volcano

18. Bandera Crater Look Out Point

Bandera Crater is the largest volcano in the region. It erupted around 10,000 years ago. There were two stages of the eruption: first the cinder cone developed, then a massive lava flow broke out this side. The molten lava reaches temperatures above 2,000 degrees Fahrenheit. Bandera's lava flow is nearly 23 miles long. At the end of the eruption, the lava suddenly fell back down the main vent making the bottom of the cone deeper than the outside lava flow. This crater is nearly 1,400 feet wide at the top and roughly 800 deep. The elevation at the look out point is 8,036. The elevation at the rim is 8,367. Over time, erosion and gravity take their toll on the crater and it is slowly filling up as cinders and rocks fall down into it. This makes for a very fragile environment. Please do not go beyond this look out point, it is not only dangerous but is also very damaging to the cinder cone.

**Thank You For Coming, Drive Safely
Visit Our Website: www.icecaves.com**

Ice Cave - Volcano Land



Old Time Trading Post

Welcome to the Ice Cave and Bandera Crater. We have two trails to hike that begin in front of the trading post. To the South, the trail leads to the Ice Cave. To the West, the trail leads to Bandera Crater. Along the way, there are numbered markers that correspond to this pamphlet. You may take either hike first. Follow the trail to one sight, return on the same path to get to the other. Please remain on the trails, making sure to leave the lava and plant life as you see it and please do not litter. You may keep this pamphlet as a souvenir, otherwise, please return it so that it may be used again. Thank you and enjoy your hike.

1. The Old Time Trading Post

The trading post was built in the 1930s along with a saloon and dance hall. At the time, the Zuni Mountain Railroad was operating and the logging industry was in full swing. They kept their beer cold using ice from the Ice Cave. In 1946, Dave and Reddy Candelaria arrived and began operations as a tourist attraction. The trading post deals in jewelry, pottery, rugs and other art of local Indian Tribes. In addition to contemporary Indian Arts, the historic trading post has ancient artifacts on display. Most of these were found in the lava, and date back 800 to 1,200 years.

**Please Remain On Trails
At All Times**

Ice Cave Trail

2. Bandera Lava Flow

The lava field seen here is made up mostly of 'A'a lava. 'A'a lava is composed of jagged, broken lava produced when the surface of the flow cools and hardens while underlying lava is still in motion. This region is called El Malpais which is Spanish for "bad lands." Pueblo Indian legend has it that the lava flow was the blood of the Kachina KauBat.

3. Ancient, Twisted Trees

The trees growing in lava find it hard to establish deep roots. The results are that the trees grow to be twisted and gnarled. Also, the shallow roots fail to support the trees in strong winds. You can see several fallen trees along the trails. Yet the lava protected many trees from the loggers in the early days. The tree that you see about 25 yards off the trail with the yellow ribbon is believed to be among the oldest living Douglas Fir trees in New Mexico. It is approximately 700 years old.

4. Natural Ice Box

In the early days, there was ice present in the bottom of this small cave. The Candelaria family utilized this as their refrigerator before electricity was available out here.

5. Sink holes

This is a large sink hole. Sink holes are created when lava tubes collapse. Sometimes the surface just stretches leaving only a shallow depression as seen on the left side of the path. Farther up, other sink holes are completely collapsed as is the one on the right side of the path. *Remember, please stay on the trail.*

6. Anasazi Indian Ruins

The circular stacks of lava that you see in this area are Anasazi Indian ruins. If you look carefully you can see stacks of lava rocks forming a wall in front of the small cave. The cave is actually a surface tube. The insulating properties of the lava made for ideal shelter. The ancient artifacts displayed in the trading post were found in ancient ruins such as this. The artifacts were found in the 1940's and 1950's.

Please help preserve this ancient sight by remaining on the path. It is unlawful to disturb ancient ruins or remove lava or artifacts.

7. Lava Tubes

This is a section of collapsed lava tube. A lava tube is formed when the molten lava pours out of a volcano. The surface hardens, while below, the lava continues to flow. The porous lava acts as an excellent insulator and keeps the lava hot beneath the surface. This creates a pipeline of lava known as a lava tube. This is the Bandera lava tube. Its overall length is 17.5 miles and is considered to be the longest in North America. Most of the lava tube has collapsed, but there are caves here and there such as the one below. On the other side of the tube you will see two logs. Those made up one of the original ladders used to climb down into this cave. Please use the hand rails as you descend the stairway and watch your step.

8. Lichen and Alpine Moss

The greens and oranges that you see on the lava are lichen and moss. The moss here is an Alpine Moss and is very rare this far south. The scaly looking green and orange growth is lichen.



Looking out of the Ice Cave

9. The Ice Cave

The temperature in this cave never gets above 31 degrees Fahrenheit. As rain water and snow melt seep into this cave, the ice floor thickens. The floor of the ice is approximately 20 feet thick. The deepest ice is the oldest and dates back 3,400 years. The green tint is caused by an Arctic algae. The back wall was formed in the early days when ancient Indians and early settlers mined the ice. In 1946, ice removal was stopped at which time the ice wall was nearly 12 feet high. Since then, the ice floor has risen relative to the back wall. The rate of ice accumulation varies with annual rainfall. The cause of original formation of ice 3,400 years ago is not

certain. However, perpetuation of the ice is due to a combination of existing conditions that make a natural ice box: 20 feet of ice in a well insulated cave shaped to trap frigid air. The Ice Cave was known to the Pueblo Indians as the Winter Lake. To help preserve this delicate environment please stay off of the ice.

Volcano Trail

10. Lightning Tree

The trees that grow on the lava face yet another type of problem. This lava flow is rich in iron content. This tends to draw lightning strikes to the trees growing in it. This tree was struck in July, 1992. If you look carefully, you can see several other trees that have also been struck by lightning. Lightning strikes are a common cause of forest fires. Smoking is another major cause of forest fires, please do not smoke on the trails.

11. Spatter Cone

This type of lava formation is called a spatter cone. Spatter cones are formed when minor vents form in the molten lava. A surge of hot air rushes through the lava forming surface tubes and minor vents. When the air breaks through the surface, lava will splash out forming a type of blow hole that you see here.

12. Area Wildlife

This is a good spot to see a variety of wildlife that inhabits this area. You will most likely see chipmunks, squirrels, lizards and birds during the day. In the mornings and evenings you might spot deer and elk. Occasionally a bear or a mountain lion will wander through here. During the summer it is not uncommon to see a bull snake on this trail. Birds that are common in this area include: American Robin, White-breasted Nuthatch, Brown Headed Cowbird, Dark-eyed Junco, Black-headed Grosbeak, Mourning Dove, Hummingbirds, Acorn Woodpecker, Stellar's Jay, and Wild Turkey.

13. More About the Trees

There are several varieties of trees that grow in this area. The Ponderosa and Piñon Pines are the most predominant. The young Ponderosa Pines have black bark and are called "Black Jack Pine." When the Ponderosa matures its bark turns a golden orange color. There are several very old Ponderosa Pines in this area. The oldest Ponderosa Pines are around 500 years old.