



Newberry
National Volcanic
Monument

Geology Brief:

The Formation of Lava Butte

Lava Butte formed 7,000 years ago when highly gas-charged magmas erupted along a zone of weakness (the **Northwest Rift Zone**). Cinders and ash were thrown high into the air as the first magma reached the surface, much like opening a bottle of soda pop after shaking it. These cinders accumulated in a **cinder cone**, which was shaped by the prevailing southwest winds. As the eruption proceeded the wind carried more cinder to the northeast side of the cone, forming a crater 180 feet deep from the highest side. The Butte (elevation 5,000') is 500' higher than the Visitor Center.

After the highly gas charged lava foam was expelled, liquid lava broke through the thinner south side of the cone, spreading over 5 miles to the north and west. Numerous overlapping flows contributed over **9 square miles** of lava before the eruption ceased.

Did You Know...

Both **black and red** cinders are found on Lava Butte, a curiosity often noticed by visitors. The first cinders formed during the eruption were black; when they fell to the ground, some landed back in the crater and were hurled out again and again. This repeated exposure to oxygen caused the black cinders to turn red as the cinders *oxidized* (rusted).



The lava flows from Lava Butte dammed the Deschutes river in many places, permanently altering the river's course. A 50 foot dam in the Benham Falls area created a lake which extended south to Sunriver and LaPine and lasted for almost 4,000 years. The numerous lava-formed dams are responsible for the many rapids and waterfalls found along the Deschutes.

The volume of rock in the Lava Butte Flow is **380,000,000 cubic yards**. Assuming a paved road 24 feet wide and six inches thick, there is enough rock in the flow to pave 160,000 miles of road, equivalent to a paved road circling the earth six and a half times.

Of the total eruption volume, 10% erupted in the form of airborne cinders, while 90% erupted as fluid magma.

In 1976, the age of the eruption was determined by carbon-14 dating a piece of charcoal found near the edge of the flow.

The road to the top of Lava Butte was completed in 1933.



