

Mel A. Kuntz
U.S. Geological Survey
MS 913, Box 25046
Denver Federal Center, Denver, CO 80225
(303) 236-1293 office, (303) 236-0214 fax
mkuntz@usgs.gov

MEMORANDUM

Date: February 7, 2000
To: Jim Morris, Superintendent, Craters of the Moon National Monument
From: Mel Kuntz, Research Geologist, U.S. Geological Survey
Subject: The Great Rift area of the eastern Snake River Plain, Idaho

Dear Jim,

At your request, I will list and describe volcanic landforms in the area of the Great Rift volcanic rift zone that I think are unique volcanic features that call for protection and active management.

Open Crack Rift Set

These are open cracks in older lava flows. The cracks were formed as tension cracks above dikes at depth. However, the dikes did not erupt onto the surface in the area of the open cracks. My paper deals with these features, describes their dimensions, and describes how they are related to dikes. The cracks are in solid rock and therefore are not likely to be easily marred or destroyed by human contact. The cracks are crossed by a few dirt roads where they are locally covered or partly filled by dirt and loose blocks of lava rock. The cracks could be destroyed by excavation for additional roads or by excavation related to mining of lava rock for decorative stone.

Kings Bowl lava field

The Kings Bowl lava field contains a myriad of volcanic features that are beautifully displayed and remarkably preserved. This is due in large part to the fact that this lava field is very young (about 2,100 yrs. old) and not covered by loess or by extensive vegetation. The Kings Bowl field is unique for several reasons:

1. The eruptive fissure system and dikes in the fissure are exposed at many localities.
2. Crystal Ice Cave is an absolutely fantastic feature that requires constant attention and maintenance to preserve the delicate ice features.
3. Entrances into the eruptive fissure system at Kings Bowl, Creons Cave and South Grotto and several other unnamed localities are truly unique features in the eastern Snake River Plain. I know of only a few other places where access to an eruptive fissure system is as well displayed as at the Kings Bowl lava field.
4. Kings Bowl is an explosion pit, the remnant of a hydrovolcanic explosion that blew out a large opening along an eruptive fissure. There are no other examples of this feature in the eastern Snake River Plain.
5. The paired tension crack system associated with the Kings Bowl eruptive fissure system is also well displayed and easily accessible.

One of the major reasons for concern about the unique volcanic features in the Kings Bowl area is that it is so easily accessible by the many roads in the area. In the time since Jim Papadakis shut down his concession and left the Kings Bowl-Crystal Ice Cave area about 20 years ago,

considerable damage has been done to fragile volcanic features. This damage due to human impact is sure to continue without active management.

Another factor that must be considered in dealing with the Kings Bowl area concerns unique types of pahoehoe lava rock exposed there. These are called "slab" and "shelly" pahoehoe. These types of pahoehoe occur as thin (<1 meter thick) slabs that can easily be excavated for building and ornamental rock purposes. I suspect that local residents are now obtaining pahoehoe slab rock for personal use in the Kings Bowl lava field. Commercial development would have a very detrimental effect on the volcanic environment in the Kings Bowl area.

Bear Trap lava tube

The Bear Trap lava tube is certainly the longest and most easily accessible lava tube in the eastern Snake River Plain. A road parallels the tube for a distance of about 10 miles. Many skylights give access to the tube along most of its length. Lava tubes have provided a wealth of archeological materials for the study of early human and animal inhabitants of the Snake River Plain. I do not know of present-day archeological studies of the Bear Trap tube by universities or other archeological groups, but certainly there is a wealth of material there that waits to be discovered. Because the tube is easily accessible to residents of south-central Idaho, it unfortunately has become a dump for a great deal of refuse. Active management may prevent further degradation of the lava tube.

Wapi Park-Pillar Butte area

A large area of unique vegetation exists in Wapi Park. Because this is an area of older, near-vent volcanic deposits, the soils there are cindery, loose and relatively deep. Wapi Park is surrounded on three sides by the young (2,100 yrs old) lava flows of the Wapi lava field. The combination of loose, deep soil surrounded by lava flows that both concentrate and preserve water has provided conditions that have lead to the development of quite large species of sagebrush, grasses and cacti. It has been a long time since I have visited Wapi Park, but I think I remember that there are also a number of aspen trees in that area. As you well know, a tree is a very rare plant in the middle of the Snake River Plain! A parking area on the road in Wapi Park is the trailhead for the trail to the Pillar Butte area. The Pillar Butte area is the vent area for the Wapi Lava field, one of the largest Holocene shield volcanoes in the Snake River Plain.

Horse Butte-Cottrell's Blowout area

This area contains several unique volcanic features that are part of the Inferno Chasm rift zone of Greeley (1977). The slot-shaped vent at Horse Butte is a deep, steep-walled chasm that is quite unlike vent areas elsewhere in the Great Rift area. Cottrell's Blowout is also a long-slot-shaped vent that shows the influence of an underlying fissure on the architecture of a vent. Between Horse butte and Cottrell's Blowout is Wildhorse Corral Butte, an elongated vent that displays evidence of repeated filling, overflow, and draining of a basaltic vent. Sullivan's Cave is a skylight entrance into Sullivan's lava tube on the eastern flank of Wildhorse Corral Butte. Adjacent to Cottrell's Blowout on the west is the most perfect example of a "perched lava pond" in the Snake River Plain. In total, the volcanic features in the Horse Butte-Cottrell's Blowout area preserve a remarkable assemblage of volcanic features that are characteristic of basaltic volcanism in the eastern Snake River Plain. All of the features in the Horse Butte-Cottrell's Blowout area are easily accessible from nearby roads, meaning, of course, that they are prone to destruction and degradation by human contact.

I have enclosed a manuscript of a paper I am writing that details some of the unique volcanic features of the Great Rift area. Two areas of specific interest described in the manuscript are the Open Crack rift set on the southeast margin of the Craters of the Moon lava field and the Kings Bowl lava field.

I should point out that there are many other significant volcanic features in the Great Rift area. I have listed only a few, ones that I think are truly unique and significant. If you would like further elaboration, please contact me and I will be happy to provide whatever information you need.

With best regards,

Mel A. Kuntz
Research Geologist