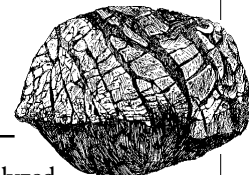




The study area at Crater's of the Moon includes ever-widening trails to popular sites such as cinder cones. The illustration depicts a once common, often collected lava feature known as a bomb. Monitoring will lead to improved protection of these resources.



GEOLOGIC FEATURES MONITORING BEGINS AT CRATERS OF THE MOON NATIONAL MONUMENT

By KATHRYN A. DIESTLER

AS RECENTLY AS 2,000 YEARS AGO, VOLCANISM along the Great Rift of the Snake River Plain in Idaho produced a spectacular landscape of cinder cones, spatter cones, lava rivers, lava tubes, and tree molds that are now preserved within Craters of the Moon National Monument. Since establishment in 1924, managers have been concerned with visitor impacts to these volcanic features. Over the years, collecting, vandalism, and offtrail hiking have led to damage in many of the high use areas. The once black, glassy crust of the lava flows now appears red and broken in many places, and *bombs* that once littered the cinder cones are now scarce (the watermark depicts a bomb). Lava Snake, a 35-foot long lava tube at Devil's Sewer, was completely destroyed by collection and vandalism. Unfortunately, only another eruption can replenish these otherwise nonrenewable resources.

In order to recognize persistent impacts and threats to the volcanic features before damage occurs, the monument initiated a geologic monitoring program in July 1994. Its purpose is to gain a better understanding of visitor impacts to the features, which will aid us in their protection in the future.

While we have not neglected monitoring the features in the past, visitation increases and time have been required to disprove a misconception that rocks are indestructible. Also, the monitoring itself ran into problems, because of the difficulty in trying to use quantitative techniques. For example, we were unsuccessful in measuring the rapid rate at which a trail leading up a cinder cones was widening (photograph). In 1985, we placed

wooden stakes on the trail; the next year, unfortunately, all of the stakes were missing, either lost within the loose cinders or taken by visitors. Staff then planted metal stakes and later used a metal detector to relocate them, but this was also unsuccessful. We realized that the predominantly loose and irregularly shaped volcanic features present a problem in designing a stationary measuring technique and also affect the accuracy of the measurements. We recognized from these experiences that we needed a more comprehensive and consistent method of monitoring impacts.

As a first step, we evaluated the volcanic features in order to determine which ones to monitor. We selected those features that met high visitor use and significance criteria. Significance was based on integrity (most of the feature still in existence), rarity, and susceptibility to damage. Next, we established photo-monitoring points and took photographs of the selected features. We plan to rephotograph the features on a periodic basis in the future to document evidence of accelerated erosion in high visitor use areas.

We selected the photo-monitoring technique for a number of reasons, one of which was strictly administrative. The resource management division at Craters of the Moon has only two permanent employees. Since both our budget and staff are small, the monitoring program needs to be simple enough that any available help can follow the procedures and produce accurate results. Additionally, a simple geologic monitoring process has a greater chance of being continued. Other reasons include universal application of the method to all the features in the program, the ease with

which the data can be analyzed and impacts identified, and its flexibility. Furthermore, we can add a variety of other components to supplement the program as it evolves over time.

We had hoped to compare these photographs with similar ones taken early in monument history so that we could assess impacts over time. Unfortunately, only a few early pictures exist depicting significant features that we can use as a baseline. In the future, when time and money allow, we will attempt to track down other early photographs from other collections that could pertain to this project. Until then, the baseline for many features will have to be current conditions.

Resources cannot be protected unless threats to them can be recognized. We believe this program will help us recognize threats and enable us to take action to protect these resources. Without such an early warning system, the opportunity to be proactive does not exist. Additionally, we can use the monitoring program to assess the effectiveness of our mitigation measures, providing us with a tool to evaluate our success in protecting our geologic resources. We realize this program will not prevent damage to these resources, but recognize that it is a step in the right direction. §

Geologist Kathryn A. Diestler developed the monitoring program for the park over a 14-week period last summer. Diestler is a graduate of Washington State University and had learned about the opportunity through the Environmental Careers Organization, a firm that places entry level professionals in environmentally oriented positions with federal, state, and local governments. Craters of the Moon hired her specifically to develop the monitoring project, because they do not have a staff geologist. Chief of Resource Management Vicki Snitzler-Neek has further details of the project and can be reached at (208) 527-3257.