

CHAPTER 1.0. INTRODUCTION

Lava tubes are used by many people for recreational purposes such as spelunking or cave exploration. Scientists use lava tubes for research of lava flow mechanisms and evolution. In the past, lava tubes have been used for dwellings and burial sites. On the other hand, lava tubes may pose a threat to roadway construction activities, long-term road stability, road maintenance, and public safety. Therefore, locating and imaging subsurface lava tubes will reduce a risk of collapse of roadways and improve lava tube preservation.

This study describes the procedures and results of recent surface geophysical surveys performed at the Lava Beds National Monument (LBNM) located in Siskiyou County, California over several known lava tubes. The main objective of this comprehensive geophysical program was to determine the most effective geophysical imaging technology for delineating voids that may pose a threat to road construction and heavy equipment working above them.

To address the requirements of this study, the Central Federal Lands Highway Division (CFLHD), Federal Highway Administration (FHWA) in coordination with Blackhawk investigated a variety of geophysical techniques at LBNM. Data were collected using Ground Penetrating Radar (GPR), Magnetics, High Resolution Shear Wave Seismic Reflection (HRSW), Electrical Resistivity and Electrical Conductivity methods.

The results of this program will support a planned road reconstruction effort in LBNM and in Hawaii as well as to support FHWA's more comprehensive initiatives concerning void detection.