

Biodiversity in High-Elevation Caves in Great Basin National Park

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Introduction

Great Basin National Park contains 43 known caves, including nearly a dozen in subalpine or alpine areas. Little was known about the biota inhabiting them. In 2007, cave biologists and park staff conducted biological surveys in seven high-elevation caves, all above 3000 m. Few cave biota were expected due to the cold temperatures of the caves, their distance from other caves, and limited nutrient inputs.

Methods

Caves were surveyed with two primary methods: pit-fall traps and direct survey. Pitfall traps were installed in caves two to seven days prior to a follow-up visit. Traps were baited with limburger cheese with antifreeze at the bottom. Direct surveys targeted the most promising habitat in each cave, with biologists using aspirators, forceps, paintbrush, and other common biological tools to collect biological specimens.

We kept records of biota found for each cave, and within each cave we separated biota by main divisions within the cave, such as entrance, twilight zone, and dark zone. A field identification was given to each specimen. Specimens removed from the cave were generally further identified to a lower taxonomic level.

Results

The seven high-elevation caves had abundant and diverse cave life. The five largest caves (Bristlecone, Broken, Cave 24, Mountain View, and Pine Cone) had between 62 and 126 specimens collected, resulting in a minimum of 12 to 37 taxa. Further taxonomic study could increase those numbers.

Findings included several species endemic to the South Snake Range such as the pseudoscorpion *Microcreagris grandis*, the millipede *Idagona lehmanensis*, and the harvestman *Cyrtobunus unguulatus unguulatus*. Additional cave biota found in some of these high-elevation caves included springtails, cave crickets, flies, spiders, mites, and diplurans. These were also found at lower-elevation caves in the park. Some species found in lower-elevation caves, such as the millipede *Nevadesmus ophipmontis* and the globular springtail *Pygmarhopalites shoshoneiensis* were absent from the high-elevation

caves. The facultatively troglonec butterfly, Milbert's Tortoiseshell *Aglais milberti*, was recorded in only two high-elevation caves. Some high-elevation caves had a number of unique taxa, largely due to accidentals found at their cave entrances (Taylor et al. 2008).

Discussion

The elevation of the cave did not appear to have a significant correlation with the number of taxa nor the number of unique taxa. The biological complexity found in these high-elevation caves alerted managers to the biodiversity found throughout the park's elevation range. The park plans to conduct additional monitoring of biota and climatic conditions to better understand these cave ecosystems.

References

Taylor, S. J., J. K. Krejca, and M. E. Slay. 2008. Cave biota of Great Basin National Park, White Pine County, Nevada. Illinois Natural History Survey, Champaign, Illinois. Center for Biodiversity Technical Report 2008 (25) 398 p.