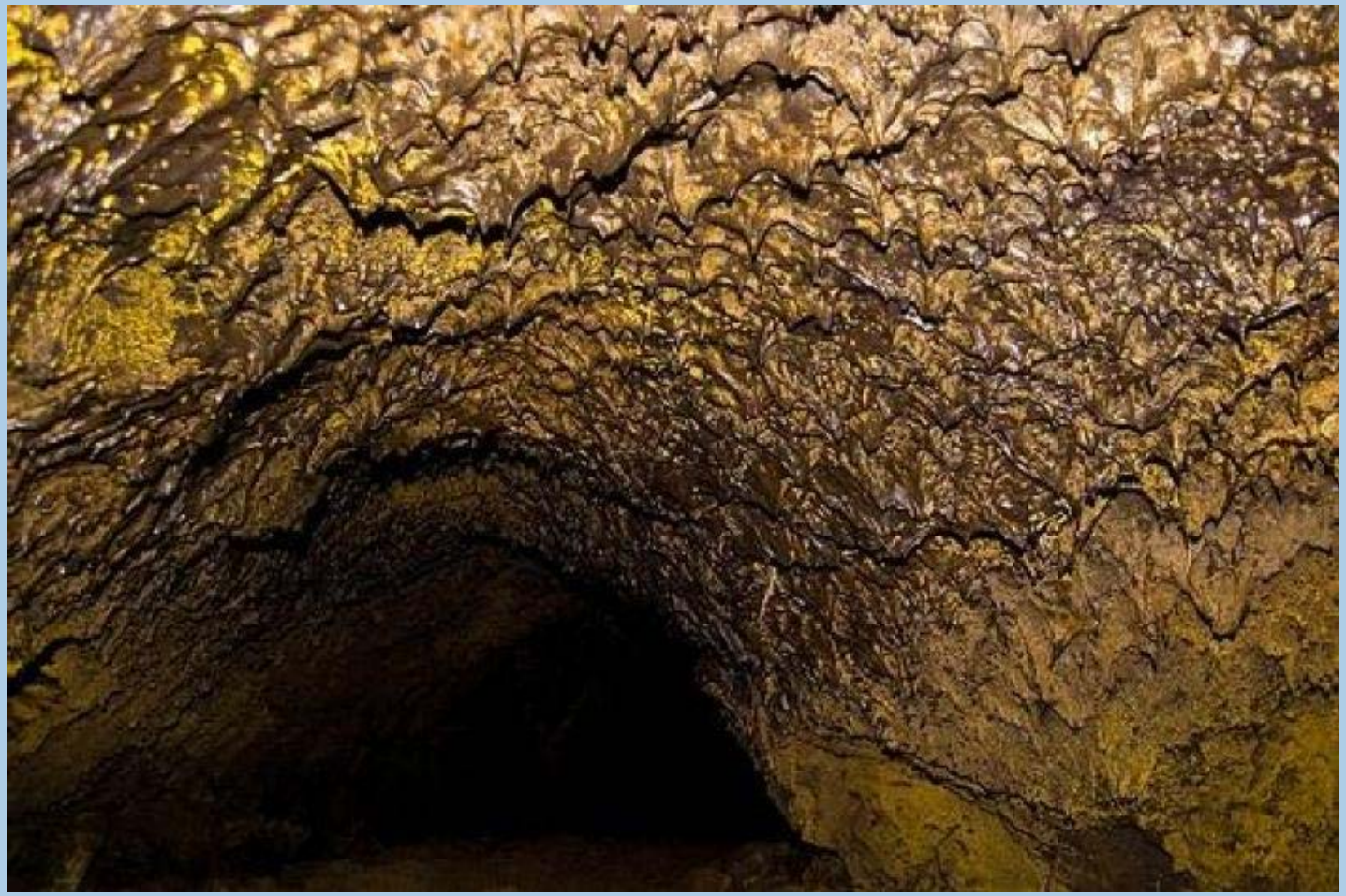
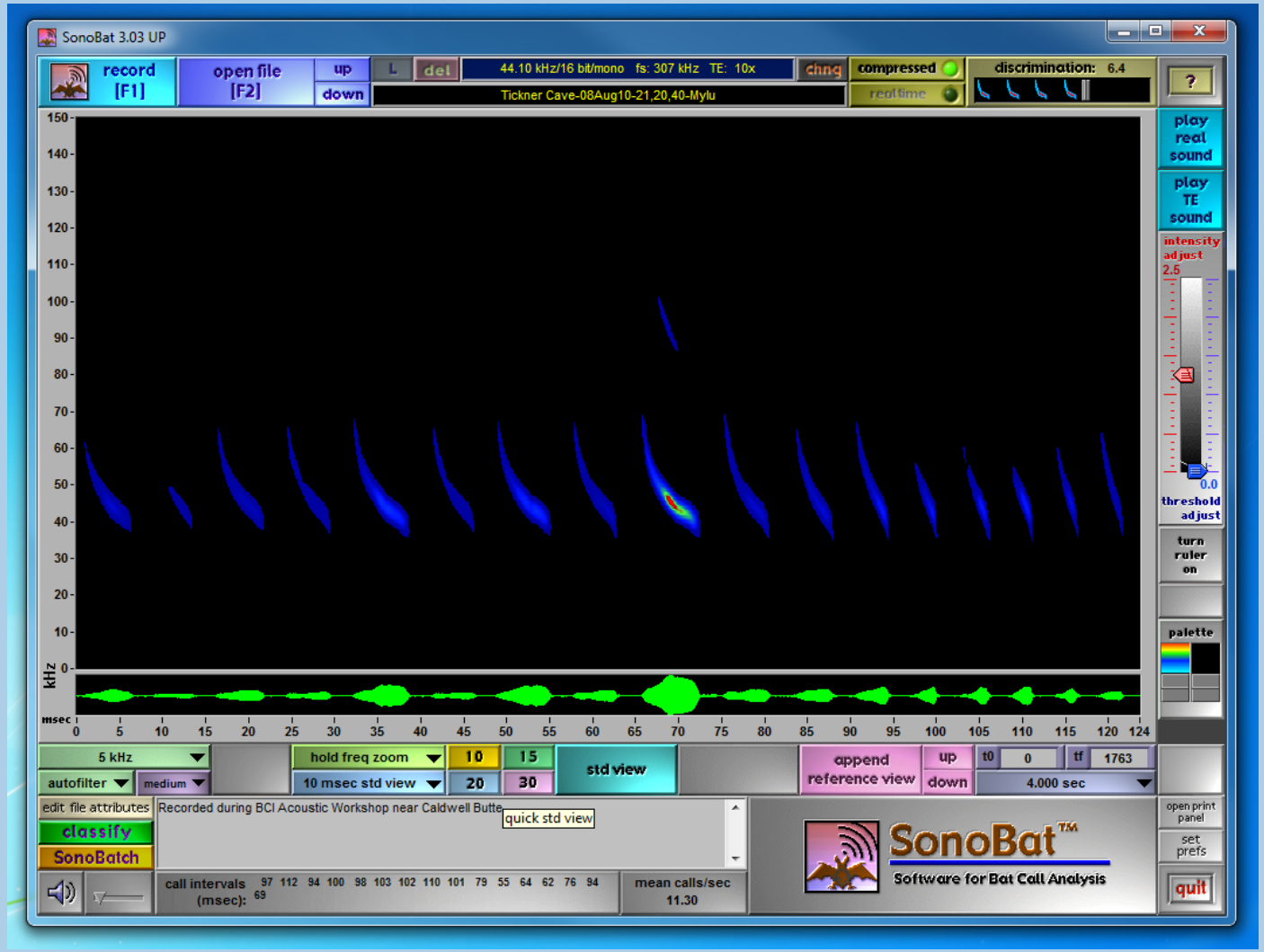
Science Communication at Lava Beds National Monument


LAVA
BEDS
NATIONAL
MONUMENT
NATIONAL PARK SERVICE



Pallid Bat


Pettersson
Pettersson


SonoBat 3.03 UP
record [F1]
open file [F2]
up
down
L
del
44.10 kHz/16 bit/mono fs: 307 kHz TE: 10x
chng
Tickner Cave-08Aug10-21,20,40-Mylu
compressed
realtime
discrimination: 6.4
?
play real sound
play TE sound
intensity adjust
2.5
0.0
threshold adjust
turn ruler on
palette
kHz
msec
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 124
5 kHz
autofilter
medium
hold freq zoom
10 msec std view
10
15
20
30
std view
append reference view
up
down
t0 0
tf 1763
4.000 sec
edit file attributes
classify
SonoBatch
Recorded during BCI Acoustic Workshop near Caldwell Butte
quick std view
call intervals (msec): 97 112 94 100 98 103 102 110 101 79 55 64 62 76 94 69
mean calls/sec 11.30
SonoBat™
Software for Bat Call Analysis
open print panel
set prefs
quit

Programs for the local community

Resources for Lava Beds staff

Summaries of Recent Studies Conducted at Lava Beds National Monument

National Park Service

Lava Beds National Monument

Natural Resources Division

Cave Dwelling Invertebrate Diversity

Compiled by Janette Perez-Jimenez, Mosaics in Science LABE Science Communications Intern (2015)

Information summarized from Taylor, Steven J. and Jean K. Krejca. (2006). A Biological Assessment of Caves in Lava Beds National Monument. Illinois Natural Survey. Center for Biodiversity Technical Report. Permit Number: LABE-2005-SCI-0004.Print.

Supplemental Diagrams sourced from http://science.howstuffworks.com/life/biology-fields/cave-biology2.htm

Background and Importance

Cave dwelling invertebrates spend their entire lives in caves, making them heavily dependent on healthy cave ecosystems. These organisms are acclimated to constant conditions and are very sensitive to slight changes in temperature, moisture, light, and pollutants (ex: litter, human waste and exotic species introductions). Caves were monitored at three different zones: entrance (area closest to the above ground environment where sunlight still persists), twilight zone (area that extends beyond the entrance where sunlight can still be seen in the distance), and the dark zone (area that extends beyond the twilight zone where no sunlight can be seen) (See Figure 1). At Lava Beds, invertebrates are particularly dependent on woodrats and bats to bring nutrients into caves in the form of feces, which is then decomposed by bacteria and fungi so that it can be easily digested by invertebrates.

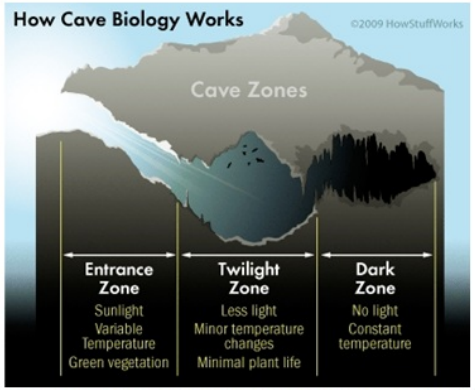


Figure 1: Cave Zone Diagram defines the three cave zones referenced in this study. Diagram sourced from http://science.howstuffworks.com/life/biology-fields/cave-biology2.htm

Where do Microbial Mats flourish?

Microbes are found on rocks in densities approaching 10 million cells/gram of rock material (Northup 2011). A possible relationship between microbial and mineral communities is suggested and awaits confirmation by scientists. Specific microbe-mineral pairings are often observed, which has led scientists to wonder if either a mutualistic or communalistic relationship is being observed. It is also speculated if microbial species can play a role in forming cave features such as stalactites and stalagmites.

How do they eat?

Most bacteria phyla found at Lava Beds National Monument are heterotrophic (cannot fix carbon) and consume organic carbon to use for growth. Bacterial communities get energy through three main mechanisms:

1. Organic carbon in the water seeps through the cave ceilings and walls.
2. Dust particles present in air are absorbed.
3. Previously dissolved ions in the basalt rock that they grow on are absorbed.

How long do they live?

An exact time frame is still unknown to scientists; however we are certain that it takes a very long time for them to recolonize an area once they are removed. In Hercules Cave there is a fingerprint smear in the shape of "'98," that suggests it takes much longer than 17 years for any type of regrowth to begin. Scientists are uncertain if the oils from our fingers are what prevent regrowth in the cave systems. It is because of this that it is very important to preserve the microbial communities that still remain in the caves.

Figure 2: Photograph of scientists recording data on microbes in Golden Dome. Photograph Credit: Kenneth Ingham, 2011.

Reaching out to the Virtual Community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ABOUT

The Lava Beds was formed by volcanic outflows from the Medicine Lake Volcano. We are the site of The Modoc War, outstanding Lava Tube caves, and...

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EEee! Hey there! The rangers are away from the computer and I thought I'd take over the facebook and introduce myself. My name is Pete, and I am a pika. Ever wanted to know something about me? Ask me anything! -Pete the Pika

(photo copyright Tom Reichner, 2014- this is what I look like when I am pondering the implications of large-scale climate change.)











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