



Beneath the Forest

Volume 9, Issue 2

Fall 2016

Beneath the Forest is a biannual newsletter published by the Forest Service of the U.S. Department of Agriculture.
Edited by Johanna L. Kovarik, Minerals and Geology Management



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CAVE AND KARST CALENDAR OF EVENTS

American Geophysical Union

December 12 - 16 2016

San Francisco, CA

<http://fallmeeting.agu.org/2016/>

Many karst sessions!

USGS Karst Interest Group

May 16 - 18 2017

San Antonio, TX

<http://water.usgs.gov/ogw/karst/kig>

National Speleological Society Convention

June 19 - 23 2017

Rio Rancho, New Mexico

<http://nss2017.caves.org/>

17th International Congress of Speleology

July 23 - 30 2017

Sydney, New South Wales, Australia

<http://speleo2017.com/>

National Cave and Karst Management Symposium

October 16 - 20 2017

Eureka Springs, Arkansas

<http://nckms.org>

Editor's Notes:

I am pleased to present our 17th issue of *Beneath the Forest*, the Forest Service cave and karst newsletter, published twice a year in the spring and in the fall. Our next issue will be the spring issue in May of 2017.

Articles for the Spring 2017 issue are due on April 1 2017 in order for the issue to be out in May 2017. We welcome contributions from stakeholders and volunteers as well as forest employees. Please encourage resource managers, cavers, karst scientists, and other speleological enthusiasts who do work on your forest to submit articles for the next exciting issue!

Cover art: Looking out of Ice Cave on the Mt Adams Ranger District, Gifford Pinchot National Forest during the winter.

Image: Ahrlin Bauman

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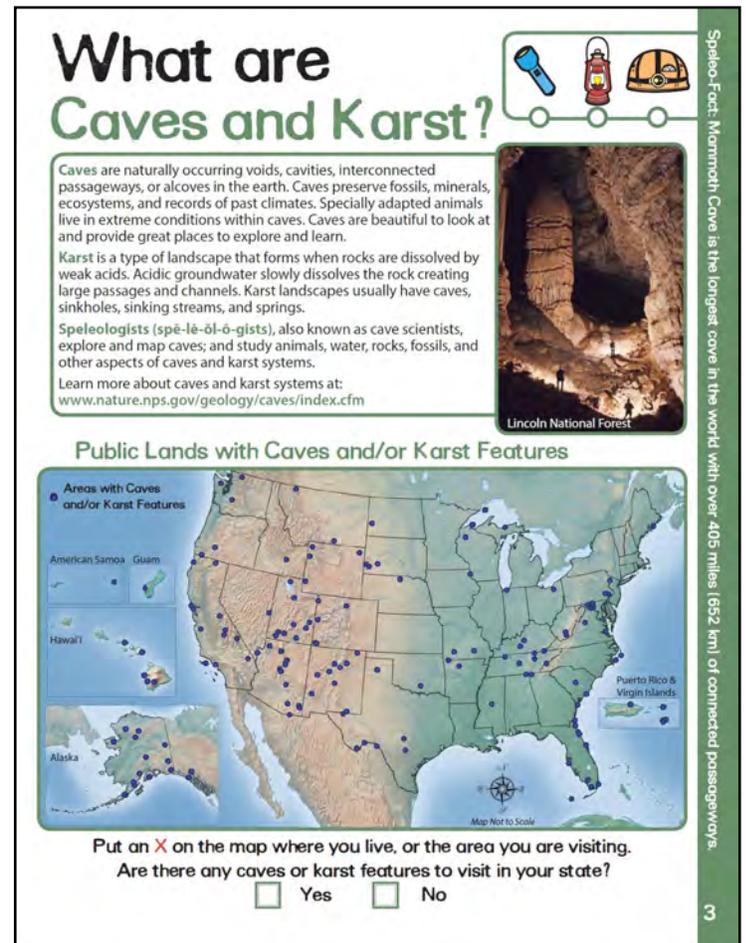
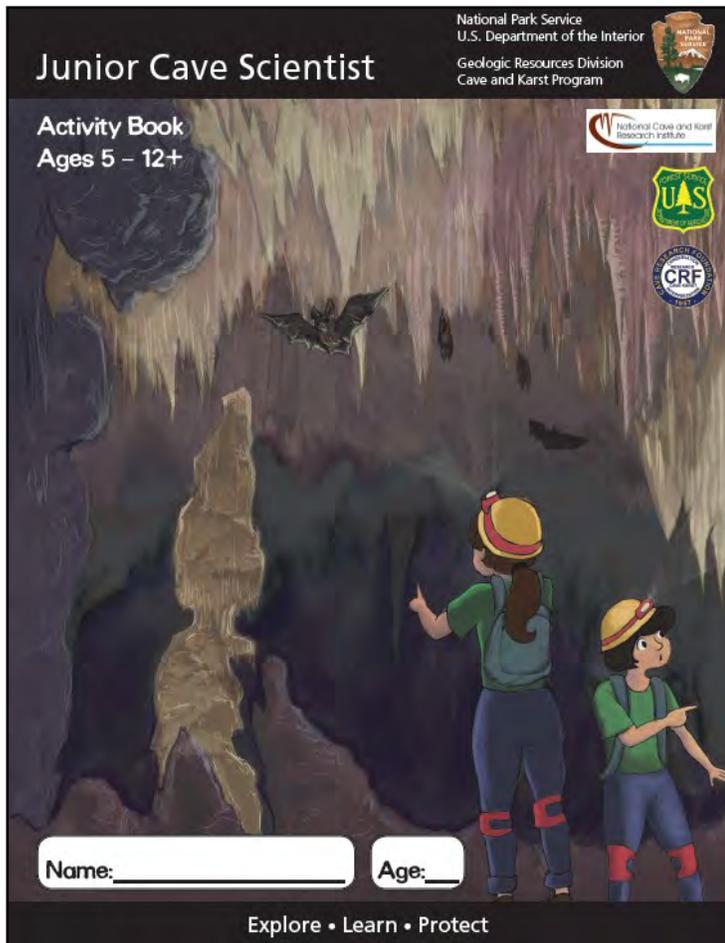
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Junior Cave Scientist Program

Dale L. Pate
National Park Service

As part of the educational Junior Ranger program within the National Park Service (NPS), the Cave & Karst Program (Geologic Resources Division) developed a Junior Cave Scientist activity booklet. Developed in 2014, the first printing of the booklets arrived for distribution in April 2015. By May 2016, all 19,500 copies had been distributed to parks, schools, other organizations, homeschoolers, scout groups, and individuals. With the need to reprint our booklet, we sought to include sponsors and partners that could help us expand our reach for this important educational program.

Left: The cover of the new Junior Cave Scientist Booklet, as adapted for use by the U.S. Forest Service.

Right: The third page of the Junior Cave Scientist Booklet, with an image from the Lincoln National Forest and locations of forests with caves and/or karst shown as blue dots.

Working with Johanna Kovarik and the U.S. Forest Service, we were able to modify our booklet slightly to be more inclusive for other agencies and organizations to use our Junior Cave Scientist activity booklets. Our 2nd printing in May 2016 of 39,000 copies shows the agency and organization logos of sponsors and partners we have added to the program including the U.S. Forest Service, National Cave and Karst Research Institute, and the Cave Research Foundation. We will continue to add agencies and organizations that are interested in this program as we reprint this very popular activity booklet. These booklets can also be downloaded at our [NPS Cave and Karst website](http://www.nps.gov/subjects/caves/junior-cave-scientist-program.htm).

(Cave Scientist continued on page 4)



New Minnetonka Cave Interpretive Plan

Cheryl Hazlitt

Rocky Mountain Region

The Montpelier Ranger District, Caribou-Targhee National Forest is undertaking a renovation of an important recreation site on the district as well as a unique land feature. Minnetonka Cave is one of a very few caves open for public tours, developed for tourism as part of the Works Progress Administration in 1939/40. Managed tours are conducted by a concessionaire during the summer and into the fall.

As part of the renovation, the district is awaiting funding to begin construction improvements to the site, and completed an interpretive plan for the site in 2016. Cave tours are given to groups of about 30 people at a time. The tours are quite popular and people can wait two to three hours in the parking lot where parking creates hazardous conditions, and the heat can be significant during summer.

This effort at improving facilities to reduce site congestion and develop a more thematic approach to messages tour guides deliver to audiences allow for providing more current issue and messages supportive of the Forest Service mission and issues. Themes for interpretation at the site will include bat health, geology and the making of a cave, what is karst, what formations reveal, cave conservation, and the specific history of developing this cave for early tourism. Funds for construction work have been requested with hopes to begin work in 2017/2018. ■



Visitors to Minnetonka Cave wait in the parking lot, sometimes for up to three hours, for a tour at the popular Forest Service site on the Caribou-Targhee National Forest. Image: C. Hazlitt

(Cave Scientist continued from page 11)

With help from the U.S. Forest Service and other sponsors, by October 1, 2016, we have distributed 35,898 Junior Cave Scientist activity booklets to 46 states, Australia, Canada, Guam, and Washington DC. One of our goals for 2017 is to publish a Spanish version of the activity booklet. We want to expand our reach even further as we seek to provide educational opportunities to teach kids and their parents about the outstanding cave and karst resources found throughout the United States and the world. ■

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BATS IN PERIL

WHITE-NOSE SYNDROME KILLS
 In 2006, a caver in New York noticed hibernating bats with an unusual white substance on their muzzles, like frost on the beard of a skier. This disease, called white-nose syndrome (WNS), is caused by a fungus (*Pseudogymnoascus destructans*) that has already killed over 6 million bats. WNS causes bats to lose their fat reserves long before the winter is over. Without these reserves—vital for surviving hibernation—they often die.

There is no known cure.

YOU CAN HELP REDUCE THE SPREAD
 White-nose syndrome is primarily spread from bat to bat. However, people can potentially spread the fungal spores among caves, mines, and other bat roost sites with contaminated clothing or equipment. Here's how you can reduce the risk:

- ✓ Avoid areas where bats may be living to limit disturbance and the potential to spread the fungus.
- ✓ Clean your footwear, clothing, and gear if you contact crevices in rock cliffs, caves, or mines.
- ✓ If you see sick or dead bats—or bats flying in winter—please contact the appropriate State Department of Natural Resources.

BAT BENEFITS
 Bats are wonderfully beneficial creatures that provide invaluable services to both nature and human economies around the world. You may not see them but they are hard at work every night.

- Bats suppress agricultural and forest pests, saving at least \$3.7 billion/year in pest control in the U.S. alone.
- A bat can eat its body weight in insects in a night—some of which carry diseases.
- Bat research has led to advancements in hearing, sonar, aerodynamics, vaccine development, blood coagulation, and more.
- Bats transport nutrients across the landscape in the form of nitrogen-rich guano.

BATS ARE INTEGRAL TO OUR ECOSYSTEMS.

Because of WNS, the Northern long-eared bat is now a protected species under the Federal Endangered Species Act (courtesy of WDNR Bat Program)

Scientists swabbing hibernating big brown bats as part of WNS research (courtesy of WDNR Bat Program)

Little brown bat with WNS (courtesy of Nancy Hoopes, NY Dept. of Environmental Education)

Little brown bat with WNS (courtesy of Ryan von Lindner)

Little brown bat catching a moth in flight (© MarkLuttrell.org)

ENFIA

learn more about WNS and decontamination methods at whitenosesyndrome.org

Chequamegon-Nicolet National Forest

U.S. Forest Service

U.S. Department of Natural Resources

An interpretive sign designed to educate the public about the importance of bats and the devastation of White-Nose Syndrome.

Forest Service Interpretive Panels Addressing Bats, White-Nose Syndrome

Lois Ziemann
Office of Sustainability and Climate Change

Cheryl Hazlitt
Rocky Mountain Region Center for
Design and Interpretation

The Center for Design and Interpretation designed interpretive panels addressing White-nose syndrome and the value of bats in our ecosystem for a variety of

locations, including the Black Hills National Forest, Beaverhead-Deerlodge National Forest, Nicolet-Chequamegon National Forest, The Pacific Northwest Region and a range of public agencies in Idaho. Most panels are 36” wide by 24” tall, designed to be installed within prefabricated frames. Other smaller panels (18” wide by 12” tall) were designed to be mounted directly to rock walls or other surfaces. The panels have been fabricated out of high-pressure laminate as well as an aluminum substrate that can be printed on both sides. These signs are used for educating the public to great success, and for contacts and information on how to use them in the field email jkovarik@fs.fed.us. There are a limited number of already-made signs available for use on western forests, for more information contact dseifert@fs.fed.us. For more information on creating signs for your forest, please contact Cheryl Hazlitt at chazlitt@fs.fed.us .▪



A WORLD APART



Little brown myotis roost here at Aztec Cave, Montana. (courtesy of Raven Devoorn)

LEAVE NO TRACE

Caves are full of mystery and allure found nowhere else. As the number of visitors grow, it is imperative that we move through these fragile wonderlands with the smallest possible impact.

- ✓ Travel in a single track to reduce trampling.
- ✓ Move carefully to avoid damaging cave features.
- ✓ Pack out all garbage and human waste.
- ✓ Never remove natural features from a cave.
- ✓ Do not disturb archaeological or paleontological artifacts.
- ✓ Do not build fires or use fireworks.

THE CAVER'S CREED

Take nothing but pictures.
Leave nothing but carefully placed footprints.
Kill nothing but time.

Townsend's big-eared bat (© Bruce Tidwell)



THE WONDER OF BATS

Bats are integral to our natural world. In the southern U.S. and tropics, they pollinate plants and disperse seeds. In the northwest they eat many insect pests that are harmful to farms and forests. You may not see them but they are hard at work every night.

BATS IN PERIL

White-nose syndrome (WNS) is a disease that is killing bats in devastating numbers. It spreads primarily from bat to bat; however, people can potentially spread the fungal spores among caves, mines, and other bat roost sites with contaminated clothes or gear. You **CAN** help reduce the spread!

- 🦇 If you see sick or dead bats, groups of bats, or bats flying in the daytime, report your observations to the appropriate State Department of Fish and Wildlife.
- 🦇 Avoid areas where bats may be living to limit disturbance and the potential to spread the fungus. (Please keep your dog out also!)
- 🦇 Clean your footwear, clothing, and gear if you come into contact with crevices in rock cliffs, talus areas, caves, or mines.



Little brown myotis with WNS (courtesy of Nancy Heald, NY Dept. of Environmental Conservation)

Little brown myotis with WNS (courtesy of Raven Devoorn)



- 🦇 A bat can eat its body weight in insects in a night.
- 🦇 Bats are not blind and most can see as well as humans. If a bat swoops toward you, it's probably after the insect hovering above your head.
- 🦇 Bats have a sonar system (echolocation) that allows them to navigate at break-neck speed in total darkness. Nothing built by humans can compare.



Harming cave resources is subject to a fine up to \$10,000 and/or imprisonment.



Learn more about WNS and decontamination methods at whitenosedsyndrome.org.



Links to forms for reporting bat observations.



WHY BATS?

Bats are wonderfully beneficial creatures that provide invaluable services to both nature and human economies around the world. Although we may not always see them, they are hard at work every night.

BAT BENEFITS

- 🦇 **They fertilize:** Bats transport nutrients in the form of nitrogen-rich guano across the landscape, particularly from stream corridors to roosts.
- 🦇 **They suppress pests:** Bats eat tons of agricultural and forest pests (such as spruce bud worm and bark beetles) saving at least \$3.7 billion per year in pest control in the U.S. alone. A bat can eat its body weight in insects in a night—some of which carry diseases.
- 🦇 **They teach us:** Bat research has led to advancements in hearing, sonar, vaccine development, blood coagulation, and more.



BATS ARE IN DECLINE

Bat populations are declining around the globe, largely as a result of human activity. Worldwide, loss of habitat remains the greatest threat. In the U.S., white-nose syndrome could possibly lead to the extinction of some bat species and the loss of their valuable contributions. A first step toward bat conservation is appreciating the role they play in a healthy planet.

MYTH BUSTERS

- 🦇 **Bats are not blind** and most can see as well as humans. If a bat swoops toward you, it's probably after the insect hovering above your head.
- 🦇 **Bats have a sonar system** (echolocation) that allows them to navigate at break-neck speed in total darkness. Nothing built by humans can compare.



Bats roost in a variety of places, including under eaves, under porches, under bridges, and in caves and mines. (Photo credit: Scott Armstrong for Conservation International)

WHITE-NOSE SYNDROME KILLS

In 2006, a caver in New York noticed hibernating bats with an unusual white substance on their muzzles, like frost on the beard of a skler. This disease, called white-nose syndrome (WNS), is caused by a fungus (*Pseudogymnosascus destructans*) that has already killed more than 6 million bats. WNS causes bats to lose their fat reserves long before the winter is over. Without these reserves—vital for surviving hibernation—they often die.

There is no known cure.



Please do not disturb hibernating bats.



Harming cave resources is subject to a fine up to \$10,000 and/or imprisonment.



If visiting caves, please clean your footwear, gear, and clothing before and after your trip. Learn more about WNS and decontamination methods at whitenosedsyndrome.org.



Report observations of groups of bats, dead or sick bats, or bats flying in the daytime.



Interpretive signs designed for educating the public on bats, White-Nose Syndrome, and protection/conservation measures.





Main photo: Jennifer Ford illuminates cave bacon to recreate historic photos in Scorpion Cave. Image: B. McGregor
Inset photo, bottom left: Cave explorer illuminates cave bacon in the same location in 1968. Image: C. Larson

Past, Present, and Future of a “Hidden Beauty”

Jennifer Ford
Klamath National Forest

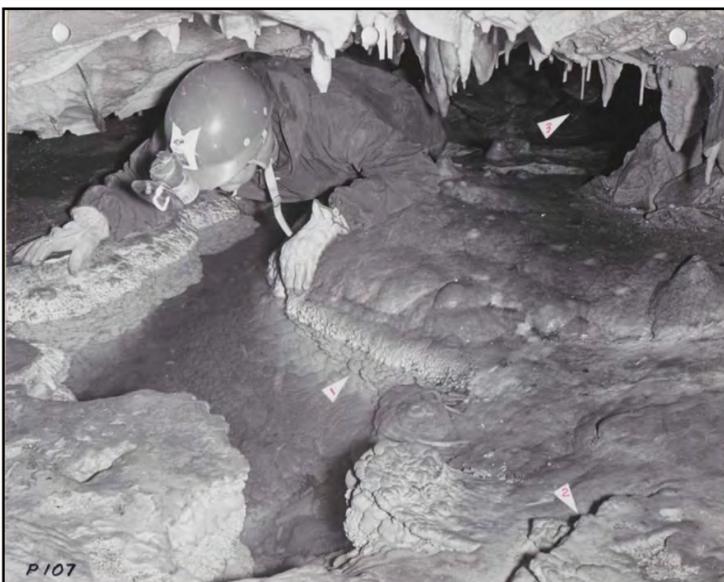
Scorpion Cave was first visited in modern times by a U.S. Forest Service smokejumper in 1966 on the Klamath National Forest (KNF). Local caver Lee Rosenberg later joined the discoverer and together they investigated the limestone outcrop and found the only known entrance.

Rosenberg originally chose the name “Hidden Beauty” but later changed his mind as he did not want to draw attention to the cave. The discovery of a scorpion near the entrance then led to the name “Scorpion Cave”.

Since discovery of the cave there has been concern with limiting traffic and avoiding publicity due to the fragile nature of speleothems and the pristine nature of the cave. Several exploratory trips to Scorpion cave occurred between 1996 and 1998. Charlie Larson photographed the cave on multiple occasions. A mineral examination was done in 1968, and the trip was made by helicopter.

(Hidden Beauty continued on page 8)

(Hidden Beauty continued from page 7)



Top photo: Jason Walls investigates a pool in the Cathedral Room. Image: B. McGregor

Bottom photo: Cave explorer investigates the Cathedral Room pool in 1968. Image: C. Larson

An Oregon Grotto expedition that took place in November of 1986 emerged from the cave after a day of exploration to find two feet of snow outside the cave. The group initially decided to try and camp in the cave, and later decided to attempt the hike out through the snow because it was too cold in the cave. Luckily no one sustained frostbite and the group made it safely home. The recent cave expedition was the first known trip to occur in over 10 years. The crew consisted of team organizer Brent McGregor, Oregon High Desert Grotto (OHDG); Neil Marchington, OHDG; Lonnie Seiders, OHDG; Jason Walz, Oregon Caves National Monument and Preserve; Bradley Wilkerson, KNF; Jennifer Ford, KNF; Steve Ramanand, KNF; and Kenneth Busby, KNF. The purpose of the expedition was to recreate photos taken during the 1960s to check for changes in the cave, both naturally occurring and human caused. In addition to the photo survey Neil collected five millipedes, one cricket, and three spiders, one of which was a Trogloraptor.

The entrance of the cave consists of a crawlway barely large enough to squeeze through. After the first few narrow crawlways the cave then opens up into larger rooms connected by smaller passageways. The biology of the cave is known to include Bushy-tailed Woodrats, bats, and various arachnid and insect species. The cave is littered with flowstone draperies known as “cave bacon”, and moonmilk. There are also a few stalactites and stalagmites. In the future there is a need to create more accurate and complete maps of the cave and continue specimen collection of potentially unique or endemic species. Photo monitoring is also an important part of continued research in the cave. The continued research of Scorpion Cave will be completed through sustainable, long-term research partnerships with the National Park Service, Oregon Grotto, and the Klamath National Forest. ■





Gifford Pinchot National Forest Cave Management

Melissa Hendrickson
Idaho Panhandle National Forests

The Gifford Pinchot National Forest contains the largest concentration of caves in the state of Washington. The caves are predominantly lava tubes formed in basaltic pahoehoe lavas flows. Many of these tubes contain delicate resources such as lava stalactites, stalagmites, cave adapted organisms, archeological sites, and bone deposits. The majority of the caves receive incidental bat use and many serve as hibernaculum for Townsend's big-eared bats as well as several *Myotis* species. Other types of caves on the forest include large shelter caves, erosional caves found beneath some of the recent basalt flows, talus caves, and caves formed where cliffs are slumping away from the mountain. There are also several locations on the forest that have tree and log molds that are highly developed and fall under the classification as caves.



Photo, top: Example of one of the bigger lava tubes that is a bat hibernaculum on the Mt. Adams Ranger District.

Image: A. Bauman

Photo, lower right: The inside of a log mold that connects to a lava tube cave. Geometric patterns are bark impressions.

Image: M. Hendrickson

In light of the detection of White-Nose Syndrome (WNS) in Washington State in March of 2016, a cave management specialist detail was filled for the Pacific Northwest Region. The following article outlines some of the cave management-related happenings on in the Gifford Pinchot National Forest (GPNF) this past year.

(Gifford Pinchot continued on page 10)



**The “meatball” formation inside Ape Cave, Mt. St. Helens National Volcanic Monument is a popular visitor attraction.
Image: J. Roppo**

(Gifford Pinchot continued from page 9)

Cave Management Strategies

A previous cave management plan had been developed in the early 1990s for the GPNF as well as one specifically for the Mount St. Helens National Volcanic Monument. Information was taken from these two documents and updated into the draft *Gifford Pinchot National Forest Cave Management Strategy 2016*. Much of the management detail remains the same from the two previous documents from the 1990s. The major update is including a WNS section and delineating decontamination zones for the GPNF. Input for the management strategy was solicited from multiple different resource areas, from different levels in the agency, other federal and state agencies, as well as from the local caving community.

Specific cave management strategies were also written for the two highly visited directed access (developed for public use) caves: Ape Cave and Ice Cave. Ape Cave is a major attraction on the Mount St. Helens National Volcanic Monument and draws upwards of 120,000 visitors a year. Recommended actions outlined in the Ape Cave Management Strategy will be used to guide the upcoming National Environmental Policy Act (NEPA) process for proposed changes in management to Ape Cave. Ice Cave is located on the Mt. Adams Ranger District and is a local novelty.

Visitor Screening, Boot Cleaning, and Education

Ape Cave is a unique opportunity to have Forest Service interaction with thousands of visitors each year.

(Gifford Pinchot continued on page 11)



Top, left: Forest Service employee Melissa Hendrickson putting up bat reporting signs at one of the bat hibernaculum caves on the Gifford Pinchot. Image: A. Bauman

Bottom, left: Boot brush stations at the entrance to Ape Cave. Image: C. Muise

Top, right: A Townsend's Big-Eared Bat (*Corynorhinus townsendii*) using one of the caves as a day roost.

to use public education to reduce the risk of introducing WNS to the forest caves. Interpreters and volunteers staff a bat education booth located at Ape Cave. Here they interact with the public, question visitors to see if they have been in other caves, if any of the items they have with them have been in other caves, and provide information about WNS and bats. Boot cleaning stations have been set up for visitors to clean dirt off their shoes before and after visiting the cave, as well as a turf section for people to walk over.

Working with Local Grottos

The local grottos have been instrumental in cave resource inventory on the Gifford Pinchot. They are a very active caving community and are constantly expanding surveys and finding new caves. Information that members are providing on bat sightings are helping the Forest Service better understand the bat usage of the caves. This fall, Grotto members helped Forest Service employees in installing bat reporting signs in the main bat hibernaculum caves on the forest. They are also conducting visitor use monitoring of some of the most popular caves and soon will be setting up and conducting repeatable in-depth cave resource inventory monitoring at Ape Cave. The conservation sections of the Grottos are also working closely with the Forest Service to expand the list of seasonal bat hibernaculum cave closures and they are instrumental in getting that information out to the caving community. ▀



SPAR Class Photo, including Forest Service participant and article author Dan Seifert (back row, far left)
Image: J. Cummins

2016 Helena Small Party Assisted Rescue Seminar

Dan Seifert
Custer-Gallatin National Forests

The National Cave Rescue Commission (NCRC) held a Small Party Assisted Rescue (SPAR) seminar in Helena, Montana in June 2016. The seminar was hosted and sponsored by the Northern Rocky Mountain Grotto (NRMG), Lewis and Clark County Search and Rescue, and the U.S. Forest Service. This was an intensive three-day introduction to cave rescue techniques that can be performed by a party of six or less persons, using minimal gear normally carried on caving trips. Due to many caves in Montana being

remote and involving multiple miles of backcountry travel as well as the likelihood of dense and technically challenging terrain, having the skills to enact a self-rescue on-site greatly benefits the chances of patients' survival as well as the overall security of the impacted caving party. Unlike some of the more densely populated karst areas in the United States, there is currently no dedicated cave rescue team or similar resource in Montana. This means that by the time communication can be established between a caving party that has had an accident and search and rescue teams, there will still be formidable obstacles to overcome in reaching the party, including long distances, rough roads, trailheads, and backcountry travel before even arriving at the cave.

Six dedicated and highly knowledgeable instructors travelled from Utah, Colorado, South Dakota, and Virginia to teach the course.

(NCRC continues on page 13)



NCRC Instructors Rene Ohms and Carl Amundson demonstrate a pick-off in the rope gym. Image: J. Cummins

Students consisted of eight NRMG members, two U.S. Forest Service employees, and five Lewis and Clark County search and rescue team members. Instructors taught students how to handle most problems that arise while caving. We worked on basic medical skills, moving patients through obstacles, helping persons who are stuck on rope, building and operating haul and lower systems, and how to prepare for and prevent problems with limited equipment and personnel.

Students were expected to study some material in advance so that the classroom sessions reinforce and elaborate on existing information. For safety and class efficiency, all students were required to demonstrate basic vertical single rope technique (SRT) skills before taking this course. [Required skills, including knots and SRT are described here:](http://caves.org/commission/ncrc/national/NCRC_Student_Area/L1_EntryPrepPkg_HO_v140308.pdf) http://caves.org/commission/ncrc/national/NCRC_Student_Area/L1_EntryPrepPkg_HO_v140308.pdf.



NRMG's Stephen Rehbein prepares to descend. NCRC instructor Mel Eady-Pumplin observes. Image: J. Cummins

Skills were practiced in a rope gym at Lewis and Clark County's Search and Rescue building and on cliffs near Helena. Several haul systems were rigged and utilized, including a 2:1, 3:1 z-rig, and diminishing loop counterbalance. We also practiced rescue scenarios on the cliffs of Mount Ascension above Helena and in a popular granite climbing area near the continental divide. The course was demanding with long days, but provided participants with valuable skills that can be used to help themselves and others when they are needed most. We enjoyed some great meals coordinated by NRMG. Thanks to Lewis and Clark County Search and Rescue for the use of their great facilities and thanks to the instructors for their dedication and time!

The ability to enact a self-rescue keeps the strain off of state and federal Search and Rescue Teams and law enforcement personnel that are not accustomed to the unique challenges posed by cave rescue situations. When accidents do inevitably occur in Montana caves, cavers trained in self-rescue skills will be better prepared to respond in a more safe and timely fashion. If you are interested in attending future trainings offered by NCRC, [please go to their website for the latest schedule:](http://ncrc.info/) <http://ncrc.info/> ▪

A New Cave Interpretation Program at Spring Cave, White River National Forest

Stephanie Bouchey
White River National Forest

Olivia Patick
White River National Forest

Victoria Houser
White River National Forest

Spring Cave, located in the Blanco Ranger District of the White River National Forest, is a popular and easily accessible wild cave. It has two large entrances that are located at an elevation of about 8000 feet along a steep but well-maintained trail that begins at the South Fork of the White River Campground. Spring Cave is popular for both cavers and non-cavers alike, as it boasts a fascinating underground river and is the fifth longest cave in Colorado. The written record of cave discovery and exploration dates back to 1891, leaving the cave with over a hundred years of unmitigated use. Spring Cave bears the scars of this use through graffiti (images, page 14), etchings, and countless broken formations.

Spring Cave is not only a popular destination for human visitors, it is also a significant swarming site and hibernaculum to at least three different species of bats: Townsend's big-eared bat (*Corynorhinus townsendii*, a rare species in Colorado), the little brown bat (*Myotis lucifugus*), and the long-legged Myotis (*Myotis volans*). Bat populations at any given



Cave interpreters Stephanie Bouchey (left) and Olivia Patick (right) in the South Fork Campground parking lot.
Image: M. Dawson

site are relatively small in Colorado. In the 1970s, Spring Cave was a hibernaculum for nearly 100 bats. Today, fewer than 20 use it during the winter, but 100 or more gather at Spring Cave during swarming season. The majority of those hibernating bats seem to be the rare Townsend's big-eared species, warranting cave protection.

As White-Nose Syndrome (WNS) spreads across North America, leaving devastated bat populations in its wake, the Colorado Forest Service has adopted a variety of methods to keep our bats safe for as long as possible. White-Nose Syndrome is caused by the fungus *Pseudogymnoascus destructans*, formerly *Geomyces destructans*, which is prone to attack hibernating bats' skin and membranes around the nose, ears, wings, and tail. It thrives in cold, moist conditions that are often found in winter hibernacula. While WNS is likely predominantly transferred from bat-to-bat, we cannot rule out the potential transfer of the fungus by careless human visitors who may carry spores on their clothing, shoes, or gear. Some significant caves in Colorado are closed year-round to protect bat roosts from the spread of WNS.

(Spring Cave continued on page 15)



Graffiti removal attempts at Spring Cave by cave interpreters Stephanie Bouchey and Olivia Patick
Images: S. Bouchey and O. Patick

(Spring Cave continued from page 14)

Others, like Spring Cave, are only closed during certain times of the year and protected through decontamination procedures while the cave is open to the public. Since 2013, the Forest Service enacted seasonal closures for Spring Cave from August 15 to April 15 (during bat swarming and hibernation). Yet, sensors placed at the cave to detect bat activity during the winter have identified winter use of the cave by human visitors. Thus, the Forest Service decided to gate the cave after receiving mitigation funds from another project. The purpose of the gate (images, page 15) is to ensure compliance with seasonal closures of Spring Cave in order to protect the bats from the potential human-aided spread of WNS, as well as to protect the bats from being awakened during hibernation. Visitor disturbance can arouse bats and cause them to deplete their fat reserves prematurely, which could lead to starvation. It is our hope that the gate will also encourage the hibernating bat population at Spring Cave to increase by making the environment more bat-friendly and secure.

In the summer of 2016, the Blanco Ranger District hired two cave interpreters, Stephanie Bouchey and Olivia Patick, through the Geological Society of America's GeoCorps America program to interface with and educate the public about bats, WNS, decontamination, and the gating project at Spring Cave (image, page 16). The position was initially intended to cover the construction of the gate, during which time we would address the inquiries, fears, and complaints about the gate. We were also to serve as liaisons between the Forest Service, the public, and the SWIFT (correctional facility) crew that built the gate, provided trail maintenance, and removed graffiti in the cave. We not only met these responsibilities, but we also expanded the position.

Our original public education goals expanded in focus after working with the many visitors at the South Fork campground. We noticed that many people were not adequately prepared for the unique challenges that underground exploration presents

(Spring Cave continued on page 16)



Gate at Spring Cave. a) Non-opening barrier at the east entrance, b) west entrance gate open, c) west entrance gate closed on August 15, 2016. Images: O. Patick and S. Bouchey

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(for example, most visitors did not have helmets, headlamps, extra sources of light and batteries, gloves, or other protective equipment). Visitors often had many questions about decontamination procedures, as well. In order to interface most efficiently with the public, we decided to give informal tours of the cave, which would allow us to talk about decontamination and cave and bat conservation in a friendlier environment. Along the tours, we often found that the steep hike up the Spring Cave Trail necessitated a slow hike or one with breaks. Because Olivia’s background

is in geology, she was easily able to incorporate a “tour though geologic time” into our hike up to Spring Cave. I took advantage of my caving background to lead the short tours through the entrance passages of Spring Cave in order to provide visitors with a safe and informative first-hand look at the beautiful underground realm of caves. The intent of the tour was to lead visitors through the safest area of the cave, while giving them some background on caving etiquette and safety, the bats that use Spring Cave, and the purpose of the gate.

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Cave Work on the Shasta-Trinity National Forest

Joel Despain

Pacific Southwest Region/ Mendocino National Forest

Paul Paul Gibson Cave is the longest cave on the Shasta-Trinity National Forest and is located in the Trinity Alps Wilderness. The map of the cave, completed in the 1970s, was incomplete and lacked detail and key resource information. In addition, spatial survey data from the original cave survey was no longer available. Good quality and detailed cave maps provide an inventory of caves and their contents. Not only is the spatial extent of the cave recorded, maps also provide an inventory of potential cave habitats, hydrologic information, paleontological resources, unusual minerals and many other cave features. Thus, a project to re-map the cave has been started. The cave is a long, hard hike to reach and difficult to find. For project work over the Columbus Day Holiday, Southwest Region staff recruited experienced cave mappers from the Shasta Area Grotto, Klamath Mountains Cave Conservation Task Force, and the Mother Lode Grotto. Five participants hiked out to the cave and were onsite from Thursday through Monday. Cavers often are willing to work on caves projects, which is of great benefit to the Forest Service. The cave team completed survey work in the cave totaling 1499 feet of cave survey; completed another 750 feet of survey on the surface between the cave entrances and the cave spring. The cave is now surveyed to a length of 3430 feet or just over a kilometer while the earlier map included 3181 feet. There is much more to map in the cave. A few disarticulated bones buried in sediment and of an unknown origin and age were noted near a tight squeeze and also in two locations in the '75 Passage. ■

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Cave interpreter Olivia Patick speaking with a family.

Image: T. Houser

While we still had some issues with cave safety, the presence of two specially-designated cave interpreters was advantageous. We increased awareness of cave regulations to at least 450 people through documented cave registration and decontamination information, which further provided a record on cave use that may not have otherwise been available. Of these 450 people, we provided informative tours to 220 of them, and talked to countless others who were casually recreating at the South Fork Campground. Our interactions with the public were not limited to South Fork. We also provided public seminars at the Meeker Public Library for both children and adults, as well as class visits to the Meeker High School. Overall, the position has proven to be highly successful and a beneficial investment, such that our supervisor Tory Houser has secured another year and is seeking funding for at least five more years for this position. We look forward to seeing this position, and the good it is doing for Colorado bats and caves, grow in the future. ■

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