

APRIL 2017

NSS NEWS

Annual Cave Conservation Issue



CALENDAR

USA

May 12-14, 2017—Western Region Speleo-Educational Seminar at Sequoia_Kings Canyon National Park.

May 19-21, 2017 –SERA Cave Carnival, held this year at Trials Training Center near Sequatchie, TN. Location is in prime cave country near the heart of TAG. Hosted by Smoky Mountain Grotto. For information see our web site at <http://sera2017.subworks.com/> and our 2017 SERA Cave Carnival Facebook page

May 26-29, 2017—The Louisville Grotto will be hosting Speleofest 2017, on Memorial Day Weekend, at The Lonestar Preserve, in Hart County Kentucky. Early arrival on Wednesday and Thursday available, and you can stay until Monday. Howdy Party on Friday night with live music by Robby Cox. Cave Central opens on Friday night with cave trip sign ups for the weekend. A Banquet on Saturday night with guest speaker and door prizes. Plenty of camping spots, port o potty's, and hot showers. Breakfast will be available on Saturday and Sunday mornings. Gear Vendors will be onsite. Vendors and Inquires, Contact David McClintock, Speleofest Chairman, @ 502-643-4590, or dmcauto@hotmail.com. Visit our website for more info and preregistration links. <http://louisville.caves.org/>

June 2-3, 2017—Middle Mississippi Valley Grotto 60th Reunion, Meramec State Park, Shelter #1. 6/3-fellowship, commercial/wild caves, hiking, canoeing, 6:30 PM pot luck. Information-ejhackerman@gmail.com

June 2-4, 2017—Spring NRO/MAR Caving Event and Philadelphia Grotto's 70th Anniversary at Indian Lookout Country Club, Pattersonville, NY. More information to be posted at: ctcavers.org/NRO-MAR-2017.htm

June 17-24, 2017—National Cave Rescue Commission 8 day seminar, Bend Oregon. Information or registration, see www.ncrc.info

June 19-23, 2017—2017 NSS Convention in Rio Rancho, New Mexico. Official Web site: <http://nss2017.caves.org/> On Facebook search 2017 NSS Convention.

July 20-23 2017—Greater Cincinnati Grotto is hosting Karst-O-Rama at the Great Saltpeter Cave Preserve, in Mt Vernon Ky. Cave trips on Friday, Saturday and Sunday. There will be cave vendors, children's activities, cave box for the flexible, climbing contest, and more. Howdy party on Friday night and a live band on Saturday night. Theme for the party is a Togo Party. Dress accordingly. This year Tee shirts are being ordered on Pre- Registration only, so be sure to check the web site for the tee shirt design.

Preregistration discount available. Visit us on <http://karstorama.com/kor16form.html> and like us on Facebook for updates! Any questions Email Don Brandner Karst-O-Rama chair Sodastraw2002@yahoo.com

October 12-15, 2017 - 39th Annual Texas Cavers Reunion - at Paradise Canyon Campground in Rio Medina, Texas. More information on the website at: <https://cavetexas.org/events/TCR/>.

July 28-August 4, 2018—2018 NSS Convention in Helena, Montana

International

July 23-29, 2017—17th International Congress of Speleology, Sydney, Australia. Facebook page: <https://www.facebook.com/Speleo2017>. Official site: <https://www.speleo2017.com/> Contact speleo2017@caves.org.au

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Front cover:

Stal line, by Ed McCarthy, won an Honorable Mention in the 2016 Photo Salon. It features caver Stephanie Petri in Yellow Jacket Pit in Tennessee.

Back cover:

Right: Trails delineated with cord in the Toca de Boa Vista in Brazil. Photo by Luciana Alt.
Left: Bryce Maxell (MTNHP) examines a bat in Lick Creek Cave. Photographer Ronan Donovan, courtesy Montana Natural Heritage Program.

Bottom: Emily Dillon in the Forest Room of New River Cave, Virginia, one of our more recently acquired NSS Cave preserves. Photo by Ed McCarthy.

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www.caves.org/pub/nssnews/style.html

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Deadline: Ads, articles, and announcements should be sent to the editor by the 1st of the month, 1 month before the month of issue (e.g., material for the March issue needs to be in by Feb. 1).

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NSS NEWS

April 2017
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Stewardship is to Explore, Study, Conserve

Val Hildreth-Werker, NSS News Conservation Editor

The Annual NSS News Conservation Issue presents the opportunity to emphasize that all caving and all exploration activity is ultimately about conservation.

Stewardship starts with discovery and first entry. Explorers and mappers take the first steps in conservation. It goes on from there, for better or worse. Responsible conservation is an integral part of every good caving activity. As we learn ever more about spelean environments, we translate that knowledge into better ways to save cave resources. For cavers, it's always been about protect and conserve.

The NSS is the umbrella organization of cave stewardship. We protect. We advocate. We explore. We study. We conserve. We do it all—stewardship is about everything we do as cavers. Good caving is integrated conservation.

For some, it's easy to forget that conservation is about so much more than cleanup and restoration. The pages of this issue reinforce how conservation goes first and extends far beyond restoration. Bottom line, it's up to us—cavers are the stewards, the keepers of the caves.

Cave safe ... cave soft ... cave clean!

Contact us with ideas, questions, comments or to offer assistance: Val Hildreth-Werker & Jim C. Werker, NSS Conservation Division Chiefs werks@cunacueva.com 575-895-5050



Val Hildreth-Werker

Phyllis Hamer standing strong in the Chandelier Ballroom, Lechuguilla Cave



Val Hildreth-Werker

Phyllis Hamer looking into the Red Lake Passage in Lechuguilla Cave

We dedicate this Conservation issue to the loving memory of Phyllis Hamer, NSS #36908. Her sure-footed ability and reliability as a caver, a cave caregiver, and a restorationist stand as a model of consistent dedication to cave stewardship and conservation. Phyllis spent countless hours over many years working in the caves of Arizona and within the chambers of Lechuguilla, on missions of exploration and mapping, science support, and conservation.

Phyllis O'Sullivan Hamer (1948-2014) was a favorite among cavers. She was quiet, reserved, confident. We dedicate this NSS Annual Conservation Issue in Memorial Celebration of Phyllis Hamer, who made our caves and trips and times together a better and brighter place.

A first-grade teacher in Tucson, Arizona, she managed to get away from the classroom and show up for a surprising number of week-long trips in Lechuguilla. Many cavers across the country remember Phyllis with her husband Dave Hamer on trips in Mexico, and leading hundreds of Arizona cave trips, especially conservation trips into SP and climbing trips into Onyx.

Many did not know, but Phyllis and Dave faced a ten-year battle, hand-in-hand

against an unexplained degenerative neurological condition that slowly and completely destroyed her motor skills. Despite the diminished condition of her physical body, her mind remained strong, sharp, solid to the very end.

Cavers and family gathered for a Memorial Life Celebration at their Tucson home. Here we record some of the beautiful sentiments describing Phyllis as we gathered 'round the campfire before spreading her ashes throughout the half-mile of cactus gardens that Dave lovingly built for Phyllis and her wheelchair, so she could be out there in the Arizona sunshine alongside Dave and his heart-driven tasks.

Quoting Dennis Hoburg. My first thought was, she's finally free. But the truth is she left us with a void the size of Lechuguilla Cave.

Quoting Jim Werker. Phyllis was subtle. All of us, trying to sleep in Lechuguilla, were awakened by Dave's roaring snore. Phyllis, with quiet spider-finger-tips, reached over him squiggling her nails up his torso. Dave woke up—screaming! We all exploded in laughter. This was a typical Phyllis moment of gentle love and joy.

Quoting their daughter Alex Hamer. I didn't appreciate her until we lost her. I was closer to her than I knew—you don't know how good you have it until you lose it. I wish I had told her.

Quoting Dave Hamer. I couldn't ever have hoped for a better partner. She was strong. She was able. She was solid. She kept up with me on my crazy push drives, hikes, and caving trips. She dug holes, hauled rocks, hefted concrete blocks right beside me. She loved me for who I am, right along with all the wrinkly, butt-headed stuff I get hell-bent on doing. She got in my face when I was out of line. Phyllis got me. And she helped me learn to take care of her, right to the end, she helped me. I love how she loved me. I love her. I miss her.

Phyllis embodied the essence of caving. Her caving family request that memorial gifts be made to the NSS Save-the-Caves Fund in honor of Phyllis Hamer NSS#36908.

<https://caves.org/nssapps/donate.shtml>

Exploring Your NSS Preserves: Do the Tour d’NSS

Tom Griffin, NSS 24333, NSS Preserve Chairman and Curt Harler, NSS 22735, NSS EVP

There are many of us that took caving for granted when we were younger with the attitude of, “Let’s see how many caves we can visit in a weekend.” Or, as a new member perhaps you returned to the same cave repeatedly, which results in a phenomena known as, “Loving a cave to death,” thus impacting the cave’s fragile ecosystem due to excessive visitation.

And while many cavers and spelunkers think they can just wander onto private, state, or federal land without fear, this is not always the case. Public access to lands has decreased over the years as lands are developed.

Help Landowners Plan for Future Cave Stewardship

Landowners have become more concerned about liability. Sinkholes are filled in due to safety concerns. And cavers do things they should not do, adversely affecting landowner relations. In addition, as landowners grow older, few ponder the question, “What should I do with my cave after I move on in life?”

Cavers recently lost access to Mystic Cave in West Virginia, due to the passing of Mrs. Phyllis Teter, a landowner who loved cavers, but never made plans for access to the cave after her passing. Thus, to promote cave conservation and perpetual access, NSS members should contemplate, “What’s going to happen to this cave when this landowner passes?”

Cavers can partner with the NSS Landowner Relations Network Committee to approach landowners about perpetual access to their caves to ensure we all have caves to visit.

Where to Cave?

As a grotto member, how many times has a new caver asked you, “Where can I go caving?” As you think back on your early days of locating caves, you think of how access has changed. You want to help this new member and teach them about responsible caving and encourage them to join the NSS. But, where can responsible cavers go? Here’s a suggestion for caving trips for newbies and old timers, alike that was initially suggested to members of the Cleveland Grotto.

Do the Tour d’NSS!

In short, the Tour d’NSS is a visit to all of the NSS Preserves—or, as many as possible.

The NSS currently has **16 Preserves** that we own or manage. As an NSS member, all of these caves are your Society’s caves—

your caves. Visit them! They are valuable resources to the NSS membership and the public.

Although there are exceptions like bat closures (and Kingston Saltpeter is closed to sport caving), most welcome visitors year-round. You can find info on the status and location of NSS caves at <https://caves.org/preserves/>, but here is a brief description of a few of your NSS Preserves.

Until recently, the New River Cave Nature Preserve in Virginia was the newest. We now have Sims Sink Nature Preserve in Suwannee, Florida. And although this newest preserve is only open for science there are many more Preserves within striking distance of home depending on where you live.

Since conventions are in different areas of the country each year, possibly on your bucket list would be to visit an NSS Preserve that may be in the area. You can take a mulligan on Mill Creek Sink since it is completely under water and can only be visited by divers. And while Great X is remote and difficult, you still can’t count it unless you’ve been there.

Some may consider a run to the NSS’s John Guilday Preserve. Older members likely have been to the three major caves there (all with good parking and easy access). Unfortunately, those who have been caving for 10 years or less are unlikely to have enjoyed these caves because of WNS shut-downs. That situation has changed. New Trout Cave and Hamilton Cave are open for visiting (while Trout Cave remains closed for bats).

There are a few NSS Preserves in New York, including Schoharie, McFail’s, and Gage Karst Preserve. If you have been to Buckner Cave in Indiana, you have visited the NSS Richard Blenz Nature Preserve. If you haven’t been, go.

You may want to visit NSS Wells Cave Preserve in Kentucky. There is another NSS Preserve in the works in Kentucky.

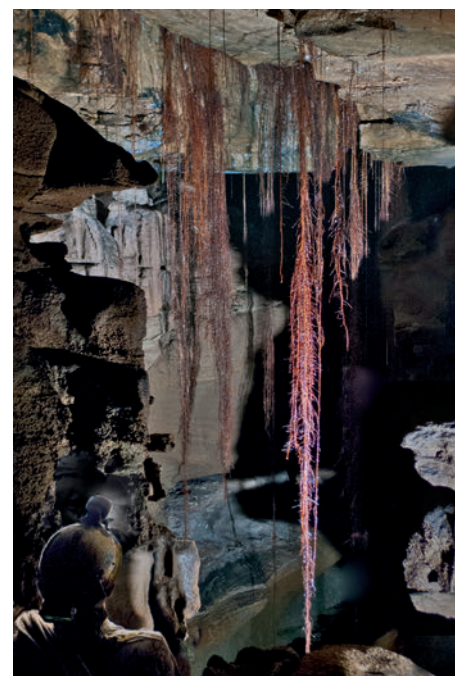
Tytoona, in Pennsylvania, should be on any Grotto member’s tick list. It can be part of a drive-by on any trip through central Pennsylvania. It is not a huge cave but has an impressive spring, making it best visited in dry years—otherwise the trip will be really short.

The Stephenson Nature Preserve is on the site of the new NSS Headquarters at 6001 Pulaski Pike—uphill from the buildings on Drake Mountain. There are several small caves there. Shelta Cave Preserve is about two miles from the new NSS Headquarters (at the site of the old HQ). Both preserves are

in the heart of Huntsville, Alabama. Shelta has a gaping opening that is reminiscent of Hidden River Cave.

As an NSS member, all of these caves are your Society’s caves—your caves. It is well worth the time and effort to visit all of the NSS Preserves. We hope to feature NSS Preserves in future issues of the *NSS News*, including photos. But to help you plan your Tour D’NSS, here’s a checklist. How many have you hit so far?

- McFail’s Cave Nature Preserve (NY)
- Shelta Cave Nature Preserve (AL)
- John Guilday Caves Nature Preserve (WV)
- Kingston Saltpeter Cave Nature Preserve (GA)
- James Gage Karst Preserve (NY)
- Warren Cave Nature Preserve (FL)
- Donald R. Russell Nature Preserve (OK)
- Schoharie Caverns Nature Preserve (NY)
- Mill Creek Sink Nature Preserve (FL) (aka Alachua Sinks)
- Tytoona Cave Nature Preserve (PA)
- Wells Cave Nature Preserve (KY)
- Great Expectations Cave Nature Preserve (WY)
- Richard Blenz Nature Preserve (IN)
- New River Cave Nature Preserve (VA)
- William J. Stephenson Nature Preserve (AL)
- Sims Sink Nature Preserve (FL)



Amy Hinkle

Tree Root Cave in the William J. Stephenson Nature Preserve (AL)



Ed McCarthy

New River Cave, Virginia



Dave Bunnell

McFails Cave, New York



Dave Bunnell

Schoharie Cave, New York



Curt Harler

Wells Cave, Kentucky



Curt Harler

NSS EVP Curt Harler with information kiosk at the New River Nature Preserve in Virginia



Derek Wolfe

Great X Cave, Wyoming



Dave Bunnell

Large rimstone dams in Shelta Cave, Alabama



Dave Bunnell

Tytoona Cave, Pennsylvania

NSS Sims Sink Nature Preserve

Buford Pruitt, Jr.

The two-acre Sims Sink Nature Preserve in Suwannee County, Florida, is the newest of the NSS nature preserves. I bought the property in 1984 and donated it to The Nature Conservancy (TNC) in 1987. In 2014, I was finally able to convince TNC that they did not have adequate resources to manage the property and to donate the preserve to the NSS. It has taken almost another three years to accomplish the transfer due to liability concerns associated with the recent CDS litigation. The BOG unanimously voted to accept the property in late 2016 and subsequently appointed me as chairman of the preserve's management committee.

Extraordinary Crayfish Habitat

Sims Sink Cave is a small cave consisting of a single room that is almost totally underwater. It is an interesting habitat unit that supports two species of cave crayfishes, two species of aquatic amphipods, and one species of aquatic isopod (*Caecidotea hobbsi*). All are stygomorphic and the crayfish are considered troglobites (obligate cavernicoles). Florida has more species of cave crayfishes than any similarly-sized area in the world, with Sim's Sink Cave being the type locality of one of them, the Santa Fe Cave Crayfish (*Procambarus erythroptus*). The latter is considered a Threatened Species by the State of Florida and is classified by the Florida Natural Areas Inventory as G1/S1 (critically imperiled globally and in the State of Florida).

The Santa Fe cave crayfish is found in a very restricted range. It has been historically observed in fewer than a dozen caves, is believed to be extirpated from several of them, and is currently known from only five sites. Sims Sink Cave contains a megapopulation of *P. erythroptus*; that is, it contains the largest known population of the species and that population is very large, being over 500 individuals at last count several decades ago. The other species of crayfish found in Sims is McLane's Cave Crayfish (*Troglocambarus maclanei*), which is recognized as the most cave-adapted crayfish in North America. As a consequence of its extraordinary biological resources, recreational cave diving is not allowed in Sims Sink Cave.

Mitigation Goals

A work event is scheduled for the weekend of February 18, 2017, with two major goals in mind. The most important goal is to remove a dilapidated platform that was constructed over the sinkhole's throat sometime before 1930. This platform was

built out of coal-tar creosoted wood. Coal-tar creosote is very toxic to crayfish, amphipods, and isopods; indeed, the few toxicity studies that have been done on its impacts to crustaceans killed all test animals regardless of how low the coal tar concentration was. Furthermore, the platform has rotted to the point that it could collapse at any time, preventing important biological research in the cave.

The accompanying photograph illustrates that the platform is coated with several inches of an organic sandy sediment, which is infused with tree roots and creosote. In addition to the platform being in danger of collapsing, it has for decades acted as a dam preventing most large food items (e.g., acorns, wild grapes, and insects) from falling into the cave and becoming forage for cave crayfish.

The second February goal is to move the double-gate of the surrounding chain-link fence from its existing location on the south side to a better spot on the west side. The double-gate was placed in the worst possible location, such that it is impossible to drive a vehicle or tractor into the property. The new location will allow preserve management vehicles and trailers to access from the adjacent local road.

Research Objectives

Several research biologists are lined up to perform studies in Sims Sink Cave. Former CDS Chairman Kelly Jessup intends to document its background water quality and continue monitoring the water over a period of years.

Dr. Jesse Breinholt, a University of Florida post-doc, wants to use genomics to estimate *P. erythroptus*' population size and

sequence its gut DNA to ascertain what it is eating in the cave.

Dr. Thomas Sawicki, another University of Florida post-doc, has been conducting morphological and genetic research on the amphipod *Crangonyx hobbsi*, collected by Paul Moler from Sims. Sawicki wants to add *Crangonyx grandimanus* and other crustaceans from Sims to his research plus conduct a mark-recapture census estimate on the cave's amphipods. We know of no one who has done such a study on stygomorphic amphipods within an aquifer.

The biggest mystery is why there are so many cave crayfish in Sims Sink Cave. My own theory is that the site once harbored a bat colony that was driven away by human activity and the platform. We plan to test that hypothesis by looking for guano and bat remains in the cave's sediments after the platform is removed.

Other future actions planned for the preserve include habitat restoration by removing invasive vegetation and replacing it with a diversity of native plants. Also, we want to find someone to perform a sedimentation assessment and accretion monitoring program at the sink. I also own the 16-acre tract that surrounds the preserve on three sides, which I maintain in an undeveloped forested state for the benefit of the preserve's biological resources.

After watching this wonderful resource languish over the past 28 years, I am truly excited at the prospects of finding out how its crayfish have fared all these years, ensuring that it continues to be superior habitat for its threatened species, using it to conduct important cave research, and restoring its epigeal mixed upland forest community.



The Sims Sink platform. Photo by the author.

The Northeastern Cave Conservancy at John Boyd Thacher State Park

Thom Engel, NSS 13832, NCC trustee

John Boyd Thacher State Park is located about 13 miles west of Albany, New York. The park is about 2500 acres in size, of which about half is karst. Caves, sinks, and springs are found in the Lower Helderberg (Manlius and Coeymans limestones), the Becraft limestone, and the Onondaga limestones. The longest known cave in the park is Hailes Cave with a current mapped length of about 4400 feet. (Hailes was also a significant bat hibernaculum prior to the advent of White Nose Syndrome.)

Cavers have long known there were a number of caves and other karst features in the park. However, since 1970 there have been regulatory restrictions on cave access. In 2013 members of the Northeastern Cave Conservancy (NCC) assisted Jim Kennedy and the State in gating Hailes Cave.

The decision to gate Hailes came out of a new master plan for the park. During this process the NCC offered to inventory and survey the caves in the park. So, the same year the bat gate was installed the NCC received a research permit from the NYS Office of Parks, Recreation, and Historic Preservation (OPRHP) to start the survey project.

Since initiating inventory the NCC has mapped or continued mapping twelve caves. We are also using LIDAR to identify karst features and then visit them. LIDAR stands for Light Detection And Ranging.

The LIDAR process uses lasers to generate data that have the effect of seeming to strip the vegetation from the land. This allows one to see the ground surface despite tree cover. Features like sinks, grikes, and stone walls are readily visible. Most of these have proven to be simple sinks, but one sink



Thom Engel,

The Visitor Center from the cliffs

was found that descends over 25 feet, though it is very tight. This inventory will continue and we are hoping to visit every feature of interest identified on the LIDAR.

The Master Plan also called for making more of the park's resources available for a greater variety of recreation such as caving. Thus, the goal of the cave inventory is, ultimately, to allow cave access throughout the park. Additionally, the plan called for a number of infrastructure upgrades and changes in the park including a visitor center, which the park has never had.

The new Visitor Center will have two karst-related exhibits: a Kids Cave and a model that shows how a karst aquifer works. The Kids Cave will be small, but will be big enough for adults to enter. It will seem bigger as flat-screen monitors will be used to show more cave beyond a tight squeeze. The NCC did a special fundraising to help pay for the Kids Cave and donated \$11,000 toward its construction. (The balance of the money

was donated by the Friends of Thacher Park.) This donation not only supports the Park's efforts to educate visitors about karst resources, but furthers the Conservancy's own educational efforts and raises the Conservancy's profile and gives us potential access to tens of thousands of visitors to the park each year.

The karst model will be roughly a sculpted cube with inset flat-panel screens that will have coordinated animations that will together show the operation of a karst aquifer. The NCC has had considerable input in the creation of both the karst model and the Kids Cave.

Cave mapping will continue as of May 1, when the caves open after being closed for bat hibernation. At this time, OPRHP permits only NCC members to do the mapping under the permit they've issued to the Conservancy. The Visitor Center is expected to open in late spring or early summer.



Ryan Von Linden



Ryan Von Linden

Left: gate construction and above, the finished gate

Appalachian Cave Conservancy 2016 Conservation Activities

Buford Pruitt, Jr.

The Appalachian Cave Conservancy (ACC) is the second-oldest cave conservancy in the US, being founded in 1978. The ACC owns or manages a total of eleven caves in southwest Virginia and eastern Tennessee. Gilley Cave is the sole cave owned by the organization, Daniel Boone and Perkins Caves are owned by ACC members, and the remaining eight caves are owned by friends of and are managed by ACC members (www.acave.us). Most ACC caves are open to all responsible cavers, only two being restricted to supervised visitation usually involving conservation, science, and management.

Gilley Cave in Lee County, Virginia, was the site of most of the ACC work during 2016. The greater part of a bat-friendly gate was constructed at Gilley's entrance over a two-year period ending in November 2010, and finished early during 2016. Designed by Tony McGee, it is believed to be among the strongest cave gates anywhere. The Gilley gate is constructed of \$6000 worth of 6x6-inch angle corrosion resistant steel and another \$350 in concrete. An estimated 4200 man-hours of volunteer labor were involved!

While many people worked on the Gilley gate, the majority of the work was done by six old-timers who worked at least six of the seven major work weekends and on other prefabrication and site improvement projects: Don Feathers, Gary Fielden, Bill James, John Matthews, Tony McGee, and Joel Stevenson. Others who helped included Jon Rossi, Joshua Garrett, Cody Blevins, and Ellen Hoffer.

The cave entrance is on the side of a steep hill with no road access, requiring all materials, tools, and equipment to be carried to the site by human porters with a little help from a Polaris all-wheel drive. These workers faced incredible adversity, including floods, surprise rain storms, vandals, and equipment failure.



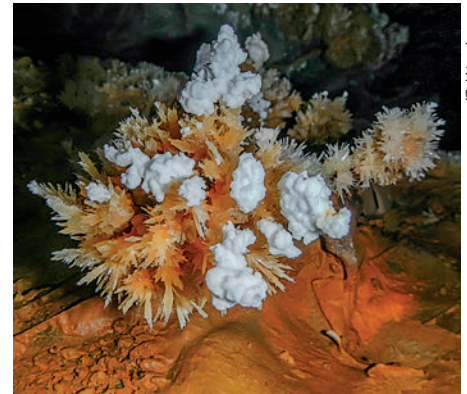
Gilley Cave gate and designer, Tony McGee

An interpretive kiosk to be erected on the trail to Gilley Cave is currently being constructed by Dan Henry and daughter Annabelle in their home workshop and will be put up on site by ACC members. The kiosk will have a locked Plexiglas-covered board with various informational maps and literature and will be protected by an asphalt-shingled roof. The kiosk will also have attached or adjacent fencing to serve as dressing screens in order to shield sensitive neighbors from the horror of mud-caked cavers changing clothes.

Next-door neighbor Daniel Crabtree graciously mows the Gilley parking area for us at no charge and indicates that he will mow around the kiosk and dressing area once the facilities are in place.

Eight ACC members and friends descended on the Gilley Cave Preserve on January 14, 2017, to clear the briars, brush, and trash from the proposed kiosk site. Trash was also collected from the wooded slope around the cave entrance. Afterward, the group toured part of the cave and brought out still more trash upon exiting. Altogether, four plastic yard bags of trash were collected by the group and hauled away by Josh Garrett and Cody Blevins. Other participants were Janet and Lydia Manning, Ellen Hoffer, Pete Kirchner, Terri Brown, and Buford Pruitt, Jr.

A general cleanup, poison ivy roundup, and surveying trip at the Perkins Cave Preserve in Washington County, Virginia, was organized by Terri Brown and done on June 25, 2016. Brush and briars were removed and poison ivy was killed around the cave entrance, field house, and entry road, and

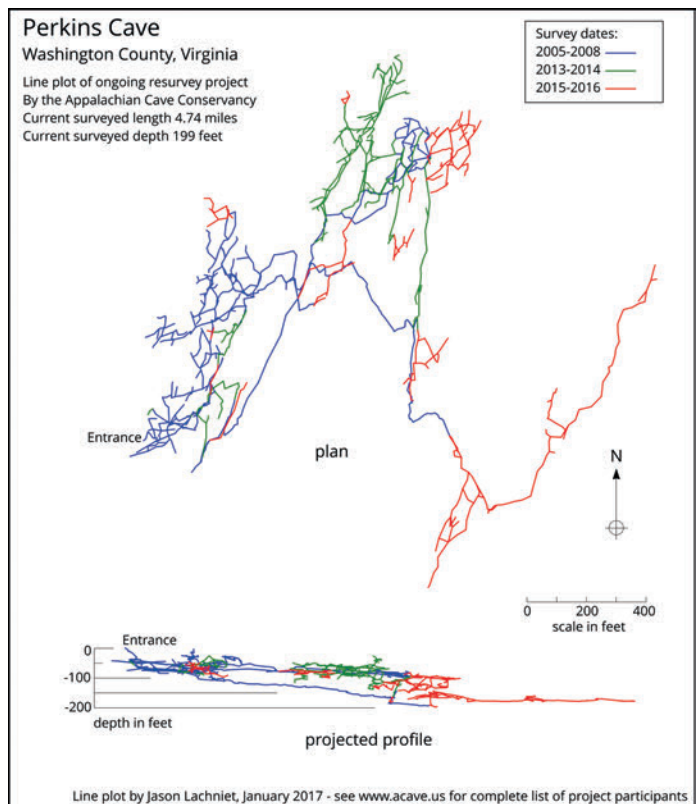


Formations (aragonite?) in Gilley Cave

trash was removed from around the cave entrance sinkhole.

Jason Lachniet, Carlin Kartchner, and Ken Walsh continued the ongoing survey of the cave, netting 1,049 feet to bring the resurvey total to 25,040 feet. Ellen Hoffer brought chilled drinks and Bill James brought chips and grilled hamburgers for the group. Other participants were Pete Kirchner, Janet Manning, Steve Bowers, Cindy Baubach, Jason Lachniet, Buzz Rudderow, and Buford Pruitt, Jr.

In March, 2017, a group plans to return to Perkins Cave to do more resurvey, restoration, and perhaps extend path-identifying markers in this heavily decorated cave in order to minimize elephant tracks.



P Kirchner

Ellen Hoffer

Texas' Oldest Cave Conservancy Acquires New Preserve in Suburban Austin Area

Jay Jorden

Looking back, 2016 was a great year for Texas cavers for a lot of reasons – plenty of great trips along with big-time exploration and mapping. Also, the [Texas Cave Management Association \(TCMA\)](#) has been successful in acquiring caves for Texas cavers, including our latest acquisition: the Wilcox Cave Preserve in Williamson County.

This deal, completed in December, follows TCMA's acquisition of Avery Ranch Cave in late 2015. The new preserves are both in far north Austin. They help ensure that unique cave resources in Central Texas will continue to be protected.

TCMA, the state's oldest non-profit cave stewardship organization, is an all-volunteer group dedicated to the study and management of Texas cave resources. It depends on donations for funding acquisition efforts. TCMA closed on the Wilcox property following negotiations that began earlier this year.

"After months of negotiations, we received the Wilcox Preserve, which includes at least three caves. These exceptional resources may also be habitats for endangered species," said John P. Brooks, TCMA president of Dallas, adding the final settlement in the property closing was reached early in December. "This real estate came as a donation from the development company that had owned it."

Covering more than four acres in the North Austin suburb of Cedar Park, the cave preserve was once part of a large ranch that had been subdivided over the last 40 or more years. Until two years ago, the property served as the headquarters of the Texas Cave Conservancy (TCC), another cave-focused conservation organization which has since been dissolved.

Known as the Wilcox tract, the new site was originally developed by Mrs. Bertha

Wilcox in the 1970s and later acquired by Fox River Austin Properties LP for use in endangered species mitigation. Fox River worked with the TCC from 2003 to 2014 to protect and preserve the caves on the property. The TCC consulted with U.S. Fish & Wildlife Service (USFWS) in conservation activities, including the protection of caves on the property and performing fire ant removal to ensure the endangered species' viability. This spring, Fox River approached the TCMA with a proposal to donate the property.

Shout-outs for Amazing Work

The TCMA gratefully acknowledges the efforts of Drew Thompson and Rich Zarria, who were instrumental in the Wilcox acquisition. They represented TCMA at a conference of conservancies and land trusts and worked behind the scenes to make the deal possible. The TCMA Acquisitions Committee has also been of tremendous help.

Additionally, TCMA would like to thank Austin Realtor Bradley Pounds, who assisted with preparing contracts on a pro bono basis. He has been a great friend of the TCMA and an excellent resource in dealing with the recent acquisition efforts.

These efforts also included acquiring Avery Ranch Cave in far North Austin. Discovered in 2001 by contractors excavating a sewer line with a rock trencher at a housing subdivision, the cave had no existing entrance and was in pristine condition when cavers entered it for the first time. Avery Ranch Cave was originally acquired by the TCC, which worked with landowners, state regulators and the USFWS to gate the entrance and protect the resource. The preserve was also fenced to manage access.



Wilcox Cave, gated

Annually, the cave was opened to the public for "Cave Day," which proved very popular.

Hundreds of residents in surrounding neighborhoods have visited the cave over the years. TCMA plans to continue and accelerate this community outreach.

Founded in 1986 as a 501(c)3 organization, TCMA was the first organization in Texas dedicated to the preservation of caves and our underground resources. TCMA owns nine cave preserves across Central and Southwest Texas, including Robber Baron Cave in San Antonio; Ezells Cave, San Marcos; and the Deep and Punkin Cave Preserve, Edwards County.

TCMA is one of 34 land trusts in Texas directly involved in protecting land for its natural, recreational, scenic, historical, or productive value. Statewide, TCMA is affiliated with the Texas Land Trust Council, Texas Speleological Association, and Texas Speleological Survey. Nationally, TCMA is affiliated with the Land Trust Alliance, National Speleological Society, and Bat Conservation International.



Left and above: Avery Ranch Cave

SRT Kids Camp Makes Learning Cave Conservation Fun

Dave Jackson

Let's travel back in time to high school or college. Think about your favorite teacher or professor. What did they do to earn your admiration? I'm guessing that they made their subject enjoyable; their enthusiasm made you want to learn.

Now think about how you learned about cave conservation. If you're like most of us, you learned about the importance of protecting caves from a more experienced caver while you had the thrill of exploring a cave. It seems unlikely that someone sat you down for a dry lecture before you ever set foot underground.

As cavers, our cave conservation projects often include at least some element of education. In addition to taking on herculean cleanup projects, we put up signs to try to educate the public to keep the problem from recurring. Posting signs is an important step, but teaching people to love caves for their own sake is also crucial.

Cave Sim in Colorado Springs Climbing Gym

I'm guilty of not having participated in a large-scale cleanup, but I spend a lot of my time teaching kids and adults to love (and protect) caves. To this end, I've started using my new CaveSim™ system in Colorado Springs to run vertical caving camps during school holidays.

Over this past Thanksgiving and Christmas, boys and girls ages 8-12 learned Single Rope Techniques in the highly-realistic 40-foot pit entrance to my CaveSim system in CityROCK Climbing Center. The kids learned to use a rack, Frog system, Prusik, and of course they learned about safety and proper gear. And I think it's fair to say that they had so much fun that they didn't even realize how much they were learning about cave conservation.

One girl was afraid to go in the horizontal part of the cave after she heard about the fake invertebrates. By the end of camp, she wanted to take the fake insects home

with her to take care of them (yes, we talked about the problem with that too – ahh, to be 8 years old again!)

Like our mobile CaveSim system, our cave at CityROCK is filled with artificial formations, each one electronically sensed to give visitors instant feedback about how carefully they are caving. At the end of their trip, visitors use a computer to review which formations they hit, and to see their overall score. During camp, the kids were encouraged to work together to get a low "cave damage" score.

They also practiced cave rescue using a Sked in the 225-foot artificial cave. What better way to learn about being a careful explorer than to practice rescue!

Honest Fun and Learning!

Kids can be wonderfully honest. One mother told me that she signed her daughter up for only the first day of camp because of their busy schedule. During camp, the daughter said, "Well, I only signed up for one day because I wasn't sure if this camp would be cool enough." Apparently it was, because she signed up for the next day, and ultimately attended every day of camp. She also ended up being far more careful in CaveSim than many adults I've seen!

By making the cave conservation lesson irresistibly fun, we're making it stick. With CaveSim camps, we're overcoming the pain and boredom of learning that Winston Churchill was referring to when he said, "Personally I'm always ready to learn, although I do not always like being taught."

Cave Sim Mobile and Onsite

If you're ever in Colorado Springs, be sure to visit CaveSim at CityROCK Climbing Center (I think the Socky's, Bob Montgomery, Teresa Johnson, and other cavers will tell you it's well worth the trip). Of course, not everyone can get to Colorado Springs, so we're still doing many programs with our mobile CaveSim system.

Most recently, we were at Kartchner Caverns in Arizona for CaveFest, which was attended by many hundreds of people from the general public. Cavers from several Arizona grottos also showed up to help teach cave conservation, and to help run CaveSim (thanks to Teresa and Hanna Johnson, who helped at Kartchner and with the Colorado Springs camps).

Over the past year, our



Dan O'Sullivan

mobile CaveSim system has been used for 30 days of conservation education events, including a very popular pre-Convention event for the townspeople of Ely, Nevada (a big thanks to Matt Bowers for making this possible, and to sponsors: National Endowment for the Humanities, Nevada Humanities, Great Basin Heritage Area Partnership, and many grottos and individuals). If you haven't explored CaveSim yet, or just want to take a look from the outside, be sure to stop by during Convention in New Mexico.

We're also booking lots of trips around the country, so if you have a regional event or school program that you'd like us to attend, just ask! Email me at jacksondmit@cavesim.com.

More Milestones

Other milestones from this past year include the issuance of a second patent protecting the CaveSim concept, the purchase of new manufacturing equipment for CaveSim, and the creation of new sensors (the Colorado Springs cave takes away a damage point if you pick up trash in the cave).

This past summer I emailed a college professor of mine from MIT to tell him how much I appreciate his enthusiastic and effective teaching style, even 15 years later. I certainly don't expect any emails in 15 years from my vertical caving campers, but I am hopeful that the bright young people in my camps and programs will carry on the work of cave conservation that you are doing today. Here's to making learning fun with a little SRT!



Dan O'Sullivan

Trail Delineation in the Biggest Brazilian Caves: Toca da Boa Vista and Toca da Barriguda

Luciana Alt and Vitor Moura

Grupo Bambuí de Pesquisas Espeleológicas (Bambuí Speleological Research Group)
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To protect highly fragile sites in the longest Brazilian caves, Toca da Boa Vista (TBV) and Toca da Barriguda (TBR), respectively with 114 and 35 kilometers mapped, the Bambuí Speleological Research Group (GBPE) carefully delineates trails.

Context and History

The complex labyrinthine network is a striking feature of Toca da Boa Vista and Toca da Barriguda, whose genesis and morphology are related to hypogenic processes (Klimchouk et al., 2016). Only 800 meters separate the two caves, however future connections are a remote possibility. Both caves have remarkable chemical and clastic deposits, and present great scientific potential for international research in speleogenesis (Auler et al., 2009), paleoclimate data (Wang et al., 2004), and paleontology (Hartwig and Cartelle, 1996).

Exploration and mapping activities in these two caves have been coordinated by the GBPE since 1987. Annual mapping expeditions bring together speleologists from different Brazilian cave clubs and from abroad.

Both TBV and TBR have relatively small entrances. TBV has three nearby pit entrances and a horizontal entrance. TBR has a pit entrance and a slope entrance, in the same doline. Considering the horizontal projection of each cave, the entrances are close to each other, which tends to limit the inner air flow. Both caves are predominantly dry, with few active speleothems, punctually localized. At TBV, a few small pools were discovered in remote areas.

Cave use by troglonexes is relatively minor and generates low trophic resources, which contributes to the scarce and minimally diversified subterranean fauna (Galan, 2001). By these characteristics TBV and TBR are considered low-energy and low-resilience environments (Gillieson, 1996).

These caves are located in Brazil's

Northeastern Region, in Bahia state, about 100 kilometers from important regional centers, such as Petrolina, Juazeiro, and Campo Formoso. The climate is semiarid, with prevailing high temperatures and long drought periods. The mean temperature of the caves is about 29°C with relative humidity greater than 90%.

Speleothems and vast fossiliferous deposits, formed during environmental conditions that no longer exist, are highly vulnerable to the impacts of uncontrolled visitation.

Climatic conditions and minimal government investment tag this region with the lowest human-development index in the country. The small villages surrounding the large caves lack basic sanitation, people have limited access to water resources, and few job opportunities exist at the local level.

Cave Use, Access, and Impacts

Being the largest Brazilian caves, their beauty and scientific importance are widely disseminated in the national media. TBV and TBR attract more and more visitors as well as possible income and leisure opportunities for the local community.

However, the caves are not prepared to receive tourism. No Management Plans were carried out. There is no training to empower the local population to safely guide visitors and protect their existing environmental resources. A Protected Area comprising the caves has not yet been created.

And the most serious concern: there are no mechanisms in place to control access to the caves, such as gates, surveillance infrastructure, or warning signs. The entrances are located near a dirt road and their coordinates are available on the Internet, which leaves the caves even more vulnerable.

Access to highly fragile cave sites, such as densely ornamented chambers and areas with fossil deposits, is relatively easy. To access the most visited areas, no vertical

equipment is required; however, along some routes, there are steep slopes or high ledges, some more than four meters high, thus presenting a safety risk for casual visitors.

The complex labyrinth network is still the major physical limitation and greatest risk factor for visitors. In this dry, hot environment, less than two days without water could lead to dehydration and death.

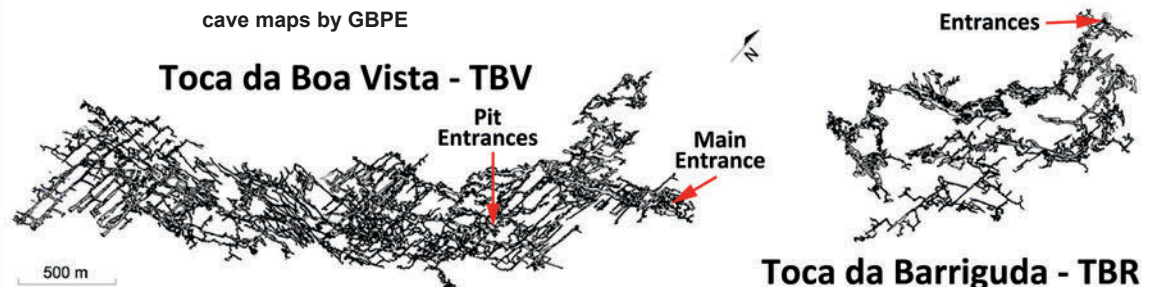
Rescue would cause extensive damage to the chemical and clastic deposits of the cave system. Transporting a rescue litter would require trail enlargement and other probable impacts. A rescue would also require complex logistics by trained speleologists who reside more than 1500 kilometers from these caves.

Educational activities in the caves are currently conducted by different cave clubs or by individual speleologists. Incipient tourism, organized by the local cave club and by local inhabitants, is on the verge of exponential expansion. No limits of acceptable change or ecologically sustainable carrying capacity for visitation is yet established. No uniform protocols for caving ethics and conservation are enforced.

In addition, almost every year new mapping expeditions add new kilometers to the caves. Many photography and filming expeditions have also occurred, generally guided by members of caving clubs.

Since the cave coordinates are available through social media, it is assumed that other types of sporadic visits are also occurring. All these activities can potentially cause permanent negative impacts in these exceptionally sensitive, low-resilience environments if people do not follow minimum-impact protocols (Hildreth-Werker et al., 2006).

In general, the conservation status of both caves is good at present. Popular passages and chambers that typically receive visitation are begging to be photomonitoring. The main irreversible damages we observe are caused by trampling over chemical and





Luciana Alt

Broken "Flying Saucer" formation (70cm diameter)



Luciana Alt

Broken shelfstone



Luciana Alt

Broken flowstone over bat fossil deposit

clastic deposits. Examples of these damages include: breakage of rare speleothems; destruction of fragile or friable speleothems (for example small cones, formed by raft deposition); speleothem surface wear by abrasion; breaks in rimstone dam borders; and clay tracked over speleothems.

In some clastic deposits, the most serious damage is the disturbance or destruction of fossiliferous deposits. In addition, the widespread trampling stirs fine particulate matter to become suspended in the air and re-deposited elsewhere on cave surfaces. The darkening of speleothems is already notable along TBV main passages, caused by deposition of dark-brown-colored fine particulate material.

Other types of damage common to touristic caves, such as graffiti, intentional breaking of speleothems, and littering are fortunately rare in TBV and TBR. However, in the last three years we have documented intensification of impacts in both caves.

Trail Delineation

Since the beginning of TBV and TBR exploration, the GBPE has adopted minimal impact practices. We select less fragile places, or more durable surfaces as pathways through virgin areas. In each area, we avoid making multiple tracks.

We use stones from nearby within the cave, non-biodegradable surveyors flagging tape, or small-diameter cord to protect small areas of greater fragility, such as exposed fossils, isolated speleothems, and guano pools.

In both caves the floor is mainly composed of a powdery layer 20- to 100-centimeters thick. Raft deposits are present in some large TBV zones.

When the trampling is concentrated in a trail, this pathway becomes clearly visible to an attentive speleologist with good lighting. However, even an experienced speleologist is subject to weariness, inattention, and doubt about the best route to follow in a cave filled with mazes.

Obviously, in some cave passages and chambers, where no trails are delineated with

flagging tape, thin cord, or other materials, multiple tracks appear and vast areas are trampled. In the last three years, as cave visitation has increased, trampling damage seems to have intensified.

Access routes to the main exploration areas deeper in the caves are located at increasing distances from entrances. To speed up the mapping teams' efficiency and to avoid trampling over wrong passages, trails to the main exploration areas were demarcated early on, around the year 2000, using galvanized steel plates with reflective tape. Since the cave is dry, most of the galvanized steel signs remain in good shape, showing no signs of corrosion. Only at specific points of higher humidity did some plates show corrosion. As demonstrated by Werker (2006), galvanized steel is not a suitable material for some cave environments. For the future, it would prove better if replaced by stainless steel.

However, to reach the main exploration sites, it was necessary to cross extremely fragile areas of the cave, such as Caatinga Passage in Toca da Barriguda. In these most vulnerable places, we delineated trails, making them about 60 centimeters wide, and created enlarged areas for rest or to take photos. (Hildreth-Werker et al., 2006)

The trail was defined with slim polypropylene rope installed along both sides of the track and fixed (secured) with small cave rocks. For educational and conservation reasons, we avoided using speleothems or their pieces for securing the thin cord along the trail. Some speleothems are extremely friable and would have their surface damaged if laced by ropes; some stalagmites are consolidated over a thin calcite layer and could even be uprooted if laced.

In the most visited and photographed cave halls, we used a slim polypro rope, with an average diameter of 4 millimeters, in white or yellow colors for visibility and to avoid unsightly interference in photographs. The first trails were thus delimited about 15 years ago. Since then, these polypropylene ropes have not undergone any type of apparent degradation. It seems to be a stable and

safe material for use in these caves.

For the trails delineated about three years ago, we used polyethylene thin rope rather than polypropylene. Neither material has shown any apparent degradation to date. Currently there are about 3 kilometers of delineated trails in TBV and TBR. All these trails were voluntarily demarcated, and the material expenses were divided among the mapping expedition members.

The main problem related to the use of thin polypropylene or polyethylene ropes is their low visibility in low-light situations. As the caves are beginning to receive tourism, quite possibly some visitors will carry low-luminance lanterns or will not carry any type of individual lighting. Therefore, we foresee future problems related to this type of trail demarcation and we have initiated systematic photographic monitoring of strategic points.

Through the photomonitoring, we registered impacts on the Flying Saucer Hall, one of the most visited rooms in Toca da Boa Vista. The flying saucers are rare speleothems in a national context, formed by raft deposits around columns or stalagmites. After the trail delineation, in January 2015, two flying saucers located off the trail were broken. Written warning signs, explaining about the room fragility and asking people to stay on the trail, were also removed. These actions indicate the trail is not being respected. With the current trend toward increased visitation, this is a foretaste of future major cave conservation problems.



Lucas Godinho

Galvanized steel signs altered by corrosion

Challenges and Possibilities

The creation of a nationally or internationally recognized protected natural area is one of the main challenges for the stewardship of Toca da Boa Vista and Toca da Barriguda. This protected area should cover at least the entire horizontal projection of both caves, and ideally, the cave's influence area. The most appropriate management categories for this effort, according to IUCN Protected Areas Categories System would be: II - National Park or III - Natural Monument or Feature. The GBPE has been working to stimulate and support the creation of these protected areas for almost two decades. But for this hope to be realized, it will be necessary to involve the state and federal governments.

Currently there is demand from Campo Formoso Municipality for controlled visitation in some parts of these caves. This is due to: (I) repercussions of international media coverage that result in giving locals and all Brazilians the hope of visiting this beautiful regional heritage site; (II) the lack of recreational facilities in the region; and (III) the demand for activities that may generate direct and indirect income for local populations. To organize safe visitation and to prevent impacts in the caves, it is fundamental to create and carry out a strong Speleological Management Plan.

It will only be possible to properly manage Toca da Boa Vista and Toca da Barriguda with the involvement of the local community and the local speleological groups. Proper management involves close contact with the natural assets. Therefore, the greatest challenges are: (I) to involve the local community; (II) to transmit the knowledge acquired through years of research in the caves; (III) to raise awareness about the fragility and importance of this heritage; and (IV) to train guides to act safely and transmit quality information to each visitor.

We believe that a cave conservation course will be an important step toward building positive cooperative relationships in the region. We dream of caves without gates, hoping that education and out-reach activities will teach visitors to avoid making negative impacts in cave environments. In the real world of tourism and economics, it is tragic to risk losing such a fragile and important heritage.

For stewardship of these resources, it is urgent to control access to these caves. For sustainability of the cave systems, it is recommended: (I) prohibit unauthorized visits in the caves and install warning signs near the cave entrances; (II) assess the feasibility, planning, and execution of physical closures to secure entrances, according to current best practices; and (III) install remote systems to monitor the cave entrances through "photo-



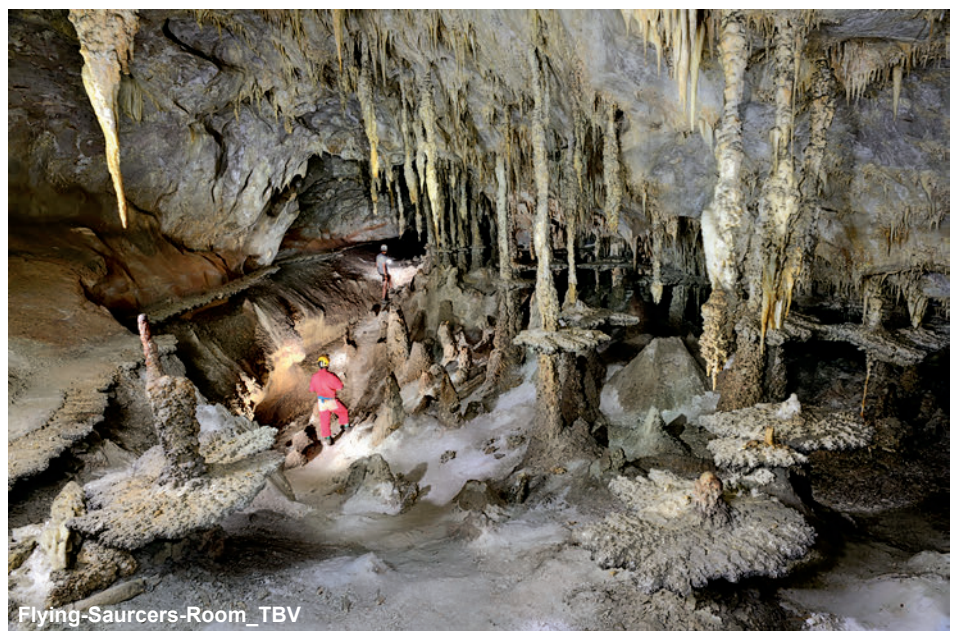
Trail through the raft cones, TBV

Luciana Alt



Trail in the Uvas, TBV

Luciana Alt



Flying-Saurcers-Room_TBV

Luciana Alt

graphic trapping”.

As the caves are extremely vulnerable in the present timeframe, several actions are necessary to protect their irreplaceable environmental significance and patrimony. Trail delineation is a vitally important step in this direction. Trail marking provides physical protection for fragile sites and lays the groundwork for educational progress to advance sustainable, decisive actions in the conservation story of this important cave region in Brazil.

Acknowledgements

Our very deep gratitude to Val Hildreth-Werker and Jim Werker for their paper revision and valued contributions. We thank all the speleologists who helped us mark the trails in TBV and TBR and who contributed to materials support for the activity. We extend a very special thanks in memory of Fabio Domeniconi, who made the trail marking days of 2015 more fun with his energetic sense of humor.

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Carrosel-Room_TBV

Luciana Alt



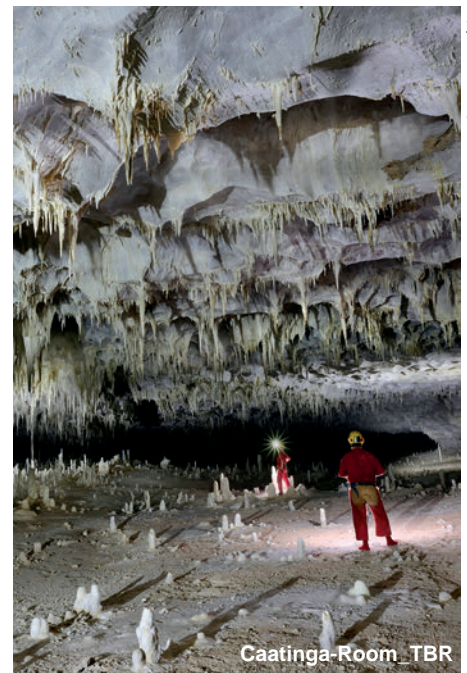
Acungui-Room_TBV

Luciana Alt



Trail in TBV

Luciana Alt



Caatinga-Room_TBR

Luciana Alt

Puerto Rico's Cave Conservation Chronicles

Angel Vega, Puerto Rico Speleological Society;

Photos Courtesy of Project Participants

Cave conservation might not be the first priority of weekend cavers that thrive on the adrenaline rush that comes from exploring rarely seen underground formations, or abseiling down pitch dark shafts—until they find a passage blocked by vehicle tires, or see themselves stretching over a pile of garbage to reach the climbing rope. That's the moment when someone says: "We have to do something about this, if we want to return here!"

From that moment on, expedition packs have space for a few plastic bags, and each time they emerge from a cave with bags full of trash, a new sense of accomplishment fills their souls. These cavers are slowly transforming into conservationists and will positively influence anyone who accompanies them to visit "the mysterious underground."

New Conservation Actions in Puerto Rico

This story marks the beginning of recent cave conservation efforts in Puerto Rico. The satisfaction gained from helping to restore a cave's natural beauty is what inspired Carlos Artiguez (everyone calls him Bro), a member of the Puerto Rico Speleological Society (SEPRI in Spanish), to raise his voice in favor of cave conservation awareness.

From the start, he realized this was not a one-man job—teamwork in the form of a conservation committee was necessary. After several ongoing conservation attempts, 2016 finally brought allies in a young couple of new SEPRI members (Tamara Gonzalez and Manuel Güivas) who were inspired to help with conservation efforts.

Their goal was to promote collaboration between the organization's active committees to coordinate the cleanup of Mantilla Cave, a cave they had explored with Geology



Hauling rig at Golondrina Cave for removing trash

Professor Tom Miller and seventy-five of his students. Their trips included initiating partial trash cleanups on three different visits to the cave.

To attract cavers, especially those who had not participated in cave cleanups before, this project needed to offer a combination of work, practice, and adventure for those involved, including new members with limited experience.

Collaboration promoted the practice of vertical skills by members of the Immersion Committee who graduated from the Cave Safety Certification course. They rappelled into one of the cave's entrances, which immediately exposed them to cave conservation by helping to clean up litter from the cave's interior.

The stage was set for the Safety and Rescue Committee with NCRS-trained members to practice rigging a hauling system for vertical extraction of garbage bags

through the cave's roof openings. This was the Conservation Committee's first official use of mechanical-advantage techniques to remove garbage from a Puerto Rican cave. The Safety and Rescue Committee rigged and managed anchors, access, safety and hauling.

The Conservation Committee coordinated the solid waste clean-up with members collecting trash and moving bags through the cave using a human chain relay, then the bags were hauled using a handmade net (created by Albert Miranda) that proved to be a great asset.

Joining Forces for Collaborative Conservation

All groups joined forces to achieve a common goal: to restore the cave's natural state of beauty. The assisting 32 volunteers managed to collect 15 garbage bags that were later taken to the nearest solid waste



Hauling party at Golondrina Cave



Hauling tires at Golondrina Cave



Bonita Cave before and after cleanup



Bonita cleanup crew waiting for pickup along with the removed trash

repository. This first official 2016 clean-up event, with Tamara’s excellent coordination and the hauling system arranged by Anthony Castro, set the standard for upcoming conservation efforts.

Soon afterwards, attention was focused on another cave in need of rescue. Bro was contacted by Michael Martin, from a group of young environmentalists who called themselves “*La Tribu Contribuye*” (The Tribe Contributes). The goal was to remove old junk and trash from the bottom of a wide vertical entrance in Bonita Cave, the home of thousands of bats.

This collaboration included the participation of the local Municipal Government, which gladly provided a dump truck to collect and properly dispose of all the extracted material, and included arrangements for newspaper coverage of the event.

Cavers were strategically assigned to the bottom of the cave to gather and prepare garbage for extraction and Ronald Richards assumed safety for the team, while others were assigned to manage the hauling system. Many non-caving volunteers and

community members were dispersed to clean the surrounding areas. This volunteer assignment worked beautifully, because the nearby road was the culprit of all new trash runoff into the cave.

The hauling system similar to the one set up in Mantilla Cave had to be modified to handle the heavier garbage; instead, a traverse highline was rigged by Pedro Dones and William Gerena. The rig was later modified with an idea from Hexan Gonzalez to create a two-to-one crane-like dropper line that provided efficient vertical removal of many tires, dozens of garbage bags, and enough metal to rebuild a car—metal that was recovered and sent for recycling. The group outside the cave filled nearly 30 garbage bags and left the curb nice and clean.

The biggest surprise was to see that the job extended beyond initial expectations by joining caver forces with the community. The overwhelming feeling of accomplishment went beyond cave conservation when an abandoned female dog was rescued. William and Maria Quintero named her Bonita, of course, and took upon themselves the cost of preparing her for adoption to a Puerto Rican family living in Boston.

That day everyone was so pumped up with enthusiasm and excitement, anything seemed possible.

Soon afterwards, Bro brought back an article from *NSS News*, September 2015, where Golondrina Cave was mentioned as a dump site for tires and old garbage. Experienced teams from the previous clean-ups/rescues quickly jumped in and initiated a complex collaboration effort.

This time, colossal powers were summoned to work cooperatively. The Mayor of the municipal town where the cave is located, was formally addressed to support the garbage disposal. Emergency management teams were contacted for back up. The local Environmental Quality agency (Junta de Calidad Ambiental in Spanish, or JCA, which is a local EPA) and three different caving organizations joined forces, experi-

ence, and equipment to rid the cave of tires and remove any sanitary uncertainty that would contribute to local Zika, Dengue, and Chikungunya outbreaks.

Pedro Dones, a mechanical engineer and SEPRI member, accepted the task of partnering with Jose Luis “Chino” Gomez to design a wire cable diagonal traverse and hauling system to transport dozens of tires 200 feet up a 50-degree slope, to the surface.

SEPRI’s Vice President, Julio Rodriguez, used his extensive experience in the role of Operations Director to station a command post from where food, water, and anchoring materials were supplied for the operation.

Carlos Acevedo provided 500 feet of wire cable for the traverse and was part of the expert team to set it up.

The Municipality donated the services of a dump truck and a digger to scrape the road and remove garbage; JCA donated the service of a specialized truck with a mechanized arm to collect tires and trash; Quebrada Rescue Unit had an ambulance available and four paramedics working the 20-foot Z-rig, which was constantly under the watchful eye of NCRC instructor, Carlos Laó.

Many cavers provided the needed muscle to cut the grass and shrubs, collect and bag all the trash, and work the hauling system. This outstanding collaborative effort yielded 50 tires, a few hundred pounds of trash, and new alliances that left everyone



Gathering trash in Bonita Cave



Opening the Jaguar Cave entrance by clearing trash

proud of the cave conservation result that was accomplished by well-coordinated teamwork.

We were also honored by an unexpected visit by Norman Veve, who despite his ailing health, wanted to share this moment with us. Norman is considered by the local Caving community to be the “Father of Speleology” in Puerto Rico, due to his leadership in pioneering the organized cave exploration on the Island. Sadly he passed away a few months later, after visiting with us. We were thrilled to hear about the first time he explored Golondrinas Cave many years ago.

Collaboration Begets More Partners!

Social media networks began to fill with photos, “likes,” and supportive comments in recognition of SEPRI’s steps toward conservation ... and the inevitable happened: Bro was called by the president of another caving organization, The Foundation of Speleological Investigations of Puerto Rican Karst (FIEKP in Spanish). A new idea was taking shape and the Conservation Committee was summoned to help by providing input from their coordinated cleanups experience.

The president, Miguel Babilonia, had submitted a proposal at work to direct employee environmental voluntary work efforts toward cave conservation, as part of an existing program for ‘making the difference’ in the community. Bro accepted the challenge and brought the Committee on board.

A well-organized effort was orchestrated. The employer supported with funds, while the employees provided “working hands”, and the two caving organizations joined forces to rescue Jaguar Cave from being a clandestine garbage dump site.

Jaguar Cave had developed an awful reputation after a 2010 report in a blog called the *Kruse Khronicles*, because of the large amount of garbage found on the entrance to the cave. This joint venture was called “*Haciendo la Diferencia en Cueva Jaguar*” (Making the Difference at Jaguar Cave).

Planning was launched—resources were gathered—volunteer work recruited, and tasks assigned. On October 29, the weather forecast was bad but hopes were sky-high.

Additional cavers from FIEKP and SEPRI joined in. Employees showed up to demonstrate they did not have soft hands. Professor Angel Acosta brought students from a scientific cave investigation university course—they had the opportunity to show their commitment to conservation by participating in this cleanup adventure.

The sponsoring company provided money for transportation and supplies; local



Left to right..Manuel Güivas, his wife Tamara Gonzalez, Jorge Acevedo, Norman Veve, Carlos “Bro”Artiguez, (next to him a local resident who just arrived wanting to help)...And Jose “Chino” Gomez at Golondrina Cave.

Cueva Golondrinas was one of the first caves that Norman Veve explored many years ago in a life filled with caving adventures. He collaborated with Russell Gurnee in the exploration of the Rio Camuy Cave system not far from Golondrinas. Norman gave us a series of talks about the history speleology in Puerto Rico during SEPRI’S 40th anniversary last year in 2016. His voice was strong and vibrant and it was fascinating to hear him speak. It was amazing how he remembered so many details. Norman pioneered the use of life vests in underground river exploration that we still use here. This was his last visit to a cave entrance, as a few months later he passed away. Norman Veve (Jan.4 1933-Nov.4 2016)

municipality sent a mechanical-arm dump truck to collect and properly dispose of all collected household garbage (i.g. chairs, couches, mattresses, tables, etc.).

The cave entrance was relieved of obstruction, and the road uphill, plus two nearby small caves, were successfully cleared out of trash. This initiative also helped prevent the garbage from ending up in the adjacent river during heavy rainfall. As part of the dramatic conclusion caused by heavy rain, Carmelo Agosto led the installation of a wire fence to detain further littering from the road, by blocking the dumping spot.

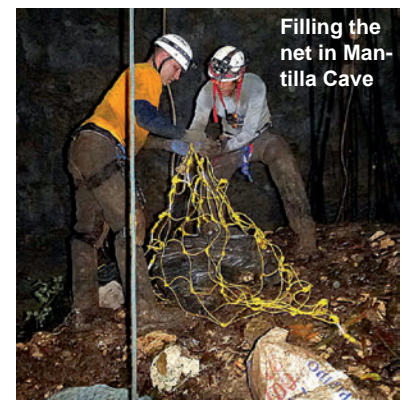
The employees would later be rewarded with a trip to two caves, led by the team of students and Professor Acosta. The entire operation had an approximate volunteer value of \$3,500 (calculated using NSS Volunteer Value forms), excluding employer contribution and cost of trash removal.

These efforts are proof that independent work takes too long to yield meaningful results. The future of cave conservation is in cross-sector, cross-functional, multi-purpose coordinations that maximize the use of expert volunteers that may be dedicated to specific meaningful tasks, based on participants expertise or higher education. As well, non-caver environmental friendly organizations are becoming key contributors in cleanup efforts in areas surrounding the caves and river tributaries.

The Cave Conservation Committee of the Puerto Rico Speleological Society is currently enjoying the rewards of collaborative work while experiencing the growing impact of positive response.

Nevertheless, the only downside to this new exciting conservation journey is that personal safety equipment is being stressed by dirt, friction, and sharp edges of garbage and junk. The next step is toward heavy industrial equipment better suited for the dead loads of cave conservation hauling. In doing so, we will protect and preserve our dear personal equipment—from which our lives hang and keep us thriving—for novel Conservation adventures.

Many thanks to the two bright souls behind this Committee, Carlos “Bro” Artiguez and Albert Miranda.



Cleaning and Restoring National Park Service Caves: Examples from Sequoia and Kings Canyon National Parks, Timpanogos Cave National Monument, and Great Basin National Park

Katie Wightman, Bonny Armstrong, and Gretchen Baker

There is evidence of humans using and exploring caves for millions of years. As humans, we have used caves as shelter from the wind, rain, cold, and heat. We have also sought them out as safe havens when wars have raged all around. We have drawn on cave walls not just to tell our stories, but to keep them preserved for future generations. And, as Tolkien put it, through our exploration and discovery we have started to reveal what is crawling and living in the “deep places of the world.”

When a visitor takes their first steps into the underground wilderness of a National Park Service cave, their senses become overwhelmed by what is being revealed in the darkness. The temperature lowers and their eyes slowly adjust as the lights along the trail pierce the darkness of the cave’s mysterious environment. The deeper they travel, the more they learn about what has been hidden in the darkness for thousands of years.

As they continue to walk through the cave, pausing to look at crystalline white stalactites frozen in time, they learn that the preservation and protection of the cave is not just about what they can see. It is also about preserving and protecting the process which forms these underground landscapes that they cannot directly observe. Visitors come with the expectation to see one of nature’s hidden treasures, but we hope they leave ready to support us in the ongoing journey and struggle to protect and preserve these incredible places that lie hidden beneath our feet.

The visitor experience plays a huge role in the national parks. Our goal is to engage all visitors on multiple platforms in hopes that they leave the parks feeling connected and inspired by their public lands. Now, while we are concerned about what experience the visitor leaves with, we also have to ask ourselves the question: what does the visitor leave behind?

Each person may have a hair or two fall out during the tour, some dirt come off the bottom of their shoes, and a few particles come off their clothing, called lint. Some also have trash that falls out of their pockets. Quantifying the amount of detritus that each person leaves behind is difficult, but one estimate is that each person leaves a belly-button’s worth of waste in the cave. Multiply that by the number of visitors each



Lint contest at Crystal Cave, November 2016, to see who could get the most lint that morning-

year, and you end up with a huge need to clean the cave.

Human impact is an inevitable reality in commercial caves. In order to allow people to pass through a cave, paths must be paved and lights need to be installed. As a result, formations are touched and sometimes tragically broken. There is algae growth due to the lights, and lint accumulates. This is the direct negative impact of opening up these places for human travel. However, let us look at the direct positive impact. Have you ever heard a 50-year-old adult gasp when they see complete darkness for the first time? Have you ever seen a child grab their parent by their sleeve eagerly trying to point out the “sparkles that look like snow?” Have you ever had someone come up to you, teary-eyed, and state “you made this place real for me?”

Yes, the negatives are a harsh reality, but the positives help us to try to avoid and mitigate those negatives to the best of our ability. The best thing about lint accumulation inside of a cave is that lint can be taken out with the help of dedicated staff and volunteers. We have

started to do just that in Crystal Cave in Sequoia and Kings Canyon National Parks, Timpanogos Cave in Timpanogos Cave National Monument, and Lehman Caves in Great Basin National Park.

Crystal Cave in Sequoia and Kings Canyon National Parks

In 2016, the National Park Service and the Sequoia Parks Conservancy welcomed over 65,000 visitors to Crystal Cave in California from the months of May thru November. Through reading different inspiring articles about lint camps in Carlsbad Caverns and Lehman Caves, and with the encouragement of friends to start a Lint Camp at Crystal Cave, I (Katie Wightman)



Cleaning lint during the Crystal Cave Lint Camp

NPS Photo by G. Baker

NPS Photo by G. Baker

set off to Great Basin's Lehman Caves Lint Camp in January of 2016. I was shocked at how much was accomplished over just three days with a small and dedicated group of people. I knew within hours of starting the Lint Camp at Lehman Caves that we could host a Lint Camp at Crystal Cave.

The planning began when I returned to Sequoia and Kings Canyon National Park (SEKI). With the help and support of the National Park Service (NPS), the Sequoia Parks Conservancy (SPC), former SEKI Cave Specialist Don Seale, and Gretchen Baker and Ben Roberts from Great Basin National Park (GRBA), Crystal Cave hosted its first ever lint camp in November 2016. In just three days, a group of 23 people comprised of volunteers, SPC staff, and NPS staff, gathered up their paint brushes, tweezers, and buckets and removed over 1,325 pounds of lint and debris from Crystal Cave!

We concentrated on the four main sections of the half mile trail that extends inside of Crystal Cave: the Ephemeral Pools trail section, the Dome Room, Marble Hall, and the Fault Room. These rooms see large impacts as they are the main stopping points for tours. The Ephemeral Pools trail section was particularly heavy with lint due to the narrow passageway and strong air. In some sections the lint was so heavy that volunteers were able to create distinct lines between cleaned sections and dirty sections.

Lint Camp is also a great time to do restoration along the cave trails. Restoration is defined as "returning something to a former condition." Every year the cave is open for visitors, we learn something new that helps us manage the cave resource more effectively. For one season in 1957, the National Park Service was having trouble funding enough park rangers to lead tours in Crystal Cave. As an experiment, the Park started self-guided tours, allowing visitors to walk unsupervised throughout the cave. As a result, many formations were broken and precious rimstone dams trampled. There was one section of rimstone dams that had been walked on so frequently that they had become full of dirt and had lost all their defining characteristics.

What a perfect place to do some restoration! During two days using paint brushes and tweezers and exercising a lot of patience and care, we were able to dig out these same rimstone dams and microgours. Through the concentrated effort of staff and volunteers we were able to reveal this characteristic of the cave that had not been seen for over 50 years!

Work like this can only be completed through the help of volunteers and staff who are dedicated and passionate about the preservation and protection of the cave environment. The SPC staff at Crystal Cave

and NPS staff are some of Crystal Cave's most dedicated advocates. I have literally had to peel my staff away from lint cleaning and restoration to go home at the end of the day! Through their work in educational tours, resource management, restoration, and lint clean-up efforts, the future of Crystal Cave is bright. However, as dedicated as we are as a staff, we still need the passion and help of park volunteers to get large amounts of work done.

This November Crystal Cave welcomed back many volunteers and trustees that had participated in restoration efforts in the past under the leadership of Joel Despain. One of the best aspects of this first Lint Camp in Crystal Cave was welcoming back these amazing people who have given long-term dedication to Crystal Cave's future. We were honored by their presence and willingness to join us in these restoration efforts. The best "thank you" that we could think of was fresh coffee and treats every morning, evening caving trips, and sitting around the campfire sharing stories. We cannot wait to host these seasoned volunteers along with new volunteers in the future.

While our first Lint Camp was a huge success, we only scratched the surface of lint removal inside of Crystal Cave. Crystal Cave has been open to visitors since 1940 and has hosted over a million visitors. That is a lot of lint accumulation. The importance of continuing to host Lint Camps in caves throughout the National Park Service and United States is paramount. Lint will continue to accumulate and there will always be a need to remove it. So, we invite you to get out your work pants, gloves, helmets, and paint brushes and come and join us in the ongoing effort to preserve and protect the wilderness hidden in darkness below our feet.

Timpanogos Cave National Monument Restoration Camps

Visitors are not likely to soon forget a trip to Timpanogos Cave National Monument (TICA) in Utah. The Timpanogos Cave system consists of three natural caves connected by two man-made tunnels, and is famous for its unusual mineralogy and prolific displays of helictites. While its hypogenic speleogenesis and abundance of formations will delight geologists and non-geologists alike, it is often the hike to the caves which makes the biggest impression on visitors. The caves' location also presents some of the biggest challenges to restoration projects.

Located in the steep and rugged American Fork Canyon in Utah's Wasatch Mountains, a trip to the caves requires visitors (and staff) to hike a mile and a half while ascending 1,100 feet in elevation. The views from the trail are spectacular and well worth the effort even when temperatures soar

above 90°F. In the winter, frigid temperatures, ice, deep snow, and serious threat of avalanches make the caves nearly inaccessible. For this reason, cave tours operate from May through October.

To handle the accumulation of lint and impact from nearly 70,000 visitors per year, regularly scheduled restoration projects began in the early 2000s. TICA's Division of Science and Resource Management (RM) recruited local cavers, staff, and a handful of volunteers to attend evening events where lint was removed and formations were cleaned along the tour trail. So as not to disrupt tours, work began after the last tour was halfway through the cave, usually after 6:00 p.m. By this time, most staff and volunteers had already worked a full day, so every attempt was made to have everyone down the mountain by 10:00 p.m. When hiking times are included, this left little time to accomplish much work in the caves. The RM team found that to accomplish a season's restoration goals, at least three restoration nights were required each summer. Over the years, volunteer attendance became sporadic, and on more than one occasion, the small RM team was accompanied by only one or two volunteers.

In 2014, TICA decided to try a different approach to restoration projects. Instead of three nights spread over a season, a Restoration Camp was planned immediately following the end of the tour season. Scheduled over three days, work could be performed during the day, and volunteers were offered free in-park housing or camping. This enhanced restoration projects in many ways. It increased the amount of time spent actually working in the caves. Tools and supplies only had to be carried up and brought down once. Condensing the projects into three consecutive days attracted out-of-state volunteers who enjoyed staying in the park and touring the area, and local volunteers found the Thursday through Saturday schedule easier for logistics.

TICA chose to use the name Restoration Camp, as opposed to Lint Camp, to convey the idea that volunteers would be doing more than picking lint and cleaning formations. Other projects volunteers have assisted with during the last three camps include speleothem repair, dismantling and cleaning bridges on the tour route, a cave lake restoration project, removal of concrete that was used to hide an old lighting system, maintenance of data loggers and roost loggers, and more. Volunteers experienced in vertical caving helped with projects that required climbing and rappelling rope, and staff who volunteered their time had the opportunity to work in a few off-trail sites they normally don't get to see. Because the Timpanogos Cave system is relatively small (more than



NPS Photo

Stalactite repairing supplies at TICA, 2014



NPS Photo

TICA employee Blase LaSala Installing stainless steel wire supports



NPS Photo

Surfaces cleaned and epoxy reapplied

half of the system can be seen from tour routes) TICA can't entice volunteers with special cave trips like other cave parks can. But volunteers do receive a special geology-focused tour from the park's cave specialist, free lodging, a group dinner, a special caving presentation, the opportunity to visit a remarkably beautiful part of the country, and the satisfaction of helping to preserve one of America's premier show caves.

Lehman Caves Lint and Restoration Camps at Great Basin National Park

Lehman Caves in Nevada has been open to the public since 1885. Over 30,000 visitors visit each year to see the numerous cave shields and other speleothems in close proximity to the cave trail. Over time, the cave lost its vibrance as a gray sheen covered many of the cave walls and speleothems.

The first Lint Camp held at Lehman Caves in Great Basin National Park (GRBA) was in 1998, and since then, over a dozen have been held, with restoration becoming more integrated in the camp. Participants typically spend part of a day brushing lint from cave walls, picking lint off formations with tweezers, and removing hairballs and trash from staircases and along the edges of the trail. Sometimes they even find historical objects, such as old candy wrappers, lightbulbs, or coins. For the restoration part, they remove old trail and blasting debris to uncover rimstone dams and flowstone that have been buried for decades.

Although this might not seem like very glamorous work, the Lint and Restoration Camps have many repeat attendees, and in 2015 and 2017, two lint camps were held because of so much interest. Thirty people registered for one lint camp in just two days, filling it to capacity. The amount of supplies and oversight limits the number of people that can successfully be hosted. The Lint and Restoration Camps are held in winter so that the park dormitory is available to some participants. In addition, GRBA likes to provide attendees with special trips to off-trail areas, like the Talus Room, and sometimes to nearby caves.

One thing that makes the Lehman Caves Lint and Restoration Camps stand apart from some others is that the public is invited. Typically about half the participants are non-cavers. They heard about the event on their cave tour or on social media. Having the mix of cavers and non-cavers provides for lots of entertainment, and everyone learns something. Some non-cavers even join grottos. Families are also encouraged to come, and there are no age limits. Kids often do really well, as they are so close to the ground!

You know you have a successful Lint



NPS Photo by G. Baker

Lint on stalactites in Lehman Cave



NPS Photo

Rachel Keske cleaning in Timpanogos



NPS Photo

Sarah Frye cleaning in Timpanogos

and Restoration Camp when someone tells you, "Don't let anyone else clean that spot. It's mine. I'll be back."

To Help Out

The future is bright for Lint and Restoration Camps and is looking even brighter as we continue to uncover the beautiful cave features in National Park Service caves.

Lint and restoration projects welcome volunteers! No experience necessary! Many of the projects have a limited amount of space.

For Crystal Cave, contact Katie Wightman at katiem@sequoiaparks.org

For Timpanogos Cave, contact Andy Armstrong at andy_armstrong@nps.gov

For Lehman Caves, contact Gretchen Baker at gretchen_baker@nps.gov



NPS Photo

Using a sprayer to clean in Timpanogos

A New Cave Interpretation Program at Spring Cave, White River NF

Stephanie Bouchey, Olivia Patick, Victoria Houser (Blanco Ranger District)

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, 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, 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 for 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 site are relatively small in Colorado. In the 1970s, Spring Cave was a hibernaculum for nearly 100 bats. Today, less than 20 individuals are present 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, 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. Others, like Spring Cave, are only closed during certain times of the year and promote thorough 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).

However, 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 is to ensure compliance with seasonal closures of Spring Cave to protect the bats from potential human-aided spread of WNS, and to protect bats from being awakened during hibernation. Visitor disturbance can arouse bats and cause them to deplete their fat reserves prematurely, which can lead to starvation. The gate may also encourage the hibernating bat population of 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 (the author) 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. The position was initially intended to cover the construction of the gate, during which time we would address 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. While fulfilling these responsibilities, we were able to extend our objectives.

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 (most visitors did not have helmets, headlamps, extra sources of light and batteries, gloves, or other protective equipment). As well, visitors often had many questions about decontamination procedures.

In order to interface most efficiently with the public, we decided to give informal tours of the cave, which allowed 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 and breaks along the way. Because Olivia's background is in geology, she was easily able to incorporate a "tour through geologic time" with the hike up to Spring Cave.



Gates 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.

Unterstein: A Conservation Story

text and photos by Amy Hinkle



Graffiti removal attempts at Spring Cave by cave interpreters Stephanie Bouchey and Olivia Patick

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 spelean realm. The intent 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.

The presence of two specially designated cave interpreters was advantageous. At least 450 people, documented through cave registrations and decontamination information, received outreach and increased awareness about bats and caves. 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 at least five more years of funding for the position. We look forward to seeing this position, and the benefits for Colorado bats and caves, grow in the future.

Acknowledgements:

S.B. and O.P. wish to acknowledge the Geological Society of America and the GeoCorps program for providing us with this wonderful opportunity. We also thank the Blanco Ranger District and Tory Houser for initiating this position.

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Pristine mud flowstone floors. Beauty in crazy formations. Delicate crystals. Pearls. Coming up out of that drop, Troy said to us, "We have a huge conservation problem on our hands." How right he was.

We went about Unterstein the way of Blue Spring Cave and Lechuguilla, designating pathways to maintain as much unmarred beauty as possible. The plan was to train cave trip leaders before putting coordinates into the Alabama Cave Survey database—cavers who could then lead others and mentor the routes for safety and conservation.

This is a case study of how our method worked in TAG. The cave was virgin—thus, monitoring the passages within a few months of traffic (61 visitors, according to the logbook) provided an interesting look at the impacts cavers can make.

Conservation is more than not breaking formations, not spray-painting, and not treating open air pits and sinkholes as trash dumps. It's the little things people drop or touch, because the little things add up.

Within the first three months of people outside of our project group going to Unterstein, we pulled out gloves, hair ties, watches, food wrappers, and broken flash bulbs. While it is sad that trash gets left behind, this does provide good news—cavers police themselves; we pick up after each other when something is lost or forgotten.

While it is disheartening to see trash gather so quickly in such a new cave, it is being removed by cavers conscious of stewardship, so the overall trash impact is minimal. However, may this remind us to be extra observant of ourselves and others in our cave party—we need to keep track of items we bring into the cave.

Within the first five months, two pools of cave pearls were so full of mud we could not see the pearls. The pristine mud-flow floor, clearly marked off by tape—someone walked out across it, and then back, obviously ignoring the path. Unlike bits of trash, these things

cannot be fixed. They are forever damaged.

In the end, despite our best attempts, we have both accidental damage and blatant damage. In the release article for Unterstein (*NSS News*, September 2016), we wrote that we assumed the competent vertical caver who would visit Unterstein would also be conservation minded. But, it takes only one person to walk across pristine floors, forever marring the surface. All it takes is one person to not watch their step with muddy boots. All it takes ...

All it takes is every single one of us being dutiful in our respect to these amazing environments we have the privilege of visiting in our short time on this earth, a mere microsecond in the geological time scale of these wonderful spelean resources.

We cannot conserve what we cannot preserve. We cannot preserve what we cannot protect. We cannot protect what we do not know exists.

Unterstein will be protected from the construction we mentioned in the release article. Our data was well-received and appropriate alterations were made in the construction plans. Had we never found Unterstein, it may well have been lost to the ages of man. Thus, we strive to keep exploring, in spite of a careless handful, so that we may protect, preserve, and conserve for generations to come.



Mud on what had been pristine cave pearls



Footprints on mud floors appeared outside the taped path...



A formerly pristine pool area now filled with mud

Restoring The Trophy Room in Fort Stanton Cave

Lynda A. Sánchez, Public Outreach Liaison, FSCSP

Deep within the twists and turns of Fort Stanton Cave, now considered a world-class cave and containing over 31 miles of known cave passage, is a section called The Trophy Room. It is located in the older part of the cave and has received much visitation by curious and interested travelers over several decades. There are numerous and beautiful formations within this part of the resource located under BLM-managed public lands near Fort Stanton, New Mexico.

According to long time caver, Lee Skinner: "The Trophy Room had other names historically like the Gallery of Wonders, as named by members of the 1891 Great Divide Expedition. It was also referred to as the Crystal Room for its velvet textured flowstone. The preferred name today is The Trophy Room (named by cavers Heinz Schwinge and Chuck Carrara) owing to its numerous tall and striking stalagmites resembling the contents of a trophy cabinet." Lee is also known as Mr. Fort Stanton and has been caving for more than fifty years.

It is easy to forget that once humans enter such a space, the deterioration begins. Unless vandals break or destroy with hammer and tong, this steady decline is often not visible, but over decades the build-up creates problems like mud being left behind as people repeatedly walk over an area. Even their breath, lint, and sometimes trash or food crumbs, carelessly left behind and forgotten, must be carried out later. These all pose a threat to a fragile and beautiful world beneath our feet.

Cavers have an outstanding conservation ethic so when the science-based research organization Fort Stanton Cave Study Project (FSCSP) conducted their latest expedition, restoration was part of their scope of conservation work. Much of this protection, like curating in museums, requires patience, dedication and hours and hours of sometimes tedious effort. The results, however, can be astounding!

Trophy Room Restoration

This recent hands-on effort occurred during the October 2016, ten-day expedition of exploration, mapping, and photo documentation. While it is great adventure to find new and exciting sections, the other parts in a cave often languish and as each decade passes some beautiful and sparkling formations and flowstone seem to call out for their past glory.

The dulling effect of mud is obvious in the photos. But mud is not the only problem that needs to be addressed. Lint and even the simple act of breathing, temperature

change, or placing a human hand on a wall for support can often leave behind spores that will attack delicate formations or begin the coating of a once pristine surface. Light can cause algae to grow, and airflow can create other problems.

Walls within a cave also provide habitat for microbiology that can easily be damaged. Humans simply tend to disturb things as they move, explore, and record. Cultural remains are another item that can be destroyed by lack of understanding of a cave's proper usage.

The special volunteers came prepared with water, gloves, sponges, plastic spoons, and other gentle cleaning tools. The dedicated members of this FSCSP team, led by Jennifer Foote (our cave restoration specialist), included Evelyn (ET) Townsend, Bruce Daily, and Kevin Strong. Entering this once spectacular room, they understood what needed to be done.

Carefully they began the time consuming process of cleaning from early in the morning to late afternoon. By the end of their scheduled work time, over 40 square feet of flowstone were restored and no doubt "grateful" for being allowed to show the world how beautiful these formations really are. Several more areas were designated for future cleaning.

ET commented afterwards, "At my age I am grateful for the opportunity to continue caving and see natural cave wonders... Caving isn't just for the young as you can see by this team, where the age span was

47 years!"

Photo documenting the work helps display for the general public the importance and the difference such efforts make, and emphasizes for everyone, even cavers, that one should be precise and careful with the underground world of grace, beauty, and incredible speleothems. These Trophy Room formations now dazzle and impress with a clear array of colors that were hidden from view in areas where humans traversed the site. The delicate and living formations will long outlive our human life span.

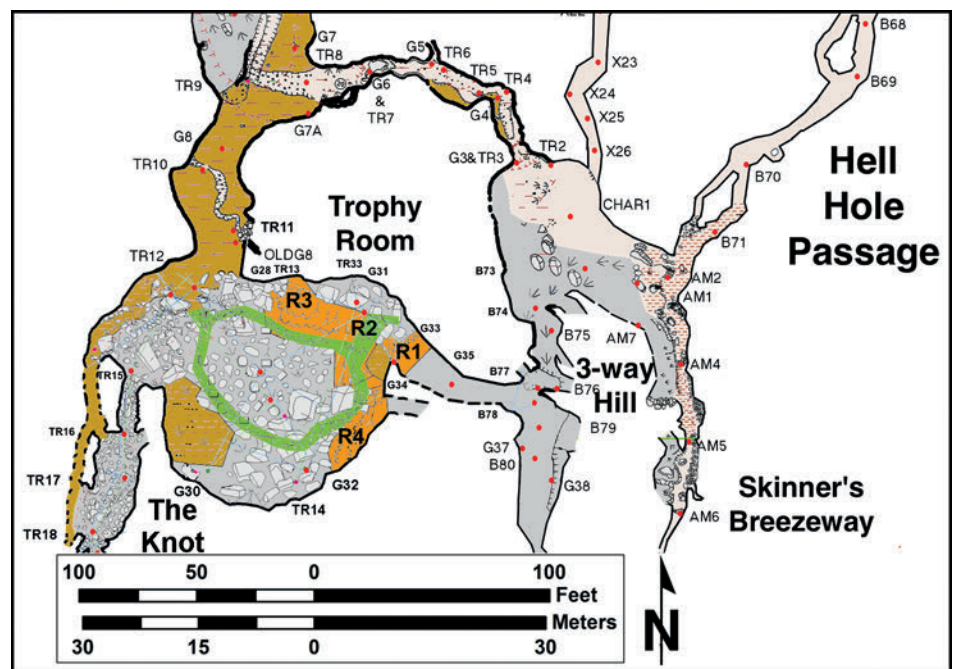
The team departed that day proud of their accomplishments, realizing that all of this restoration and conservation work is an integral part of caving, of cave discovery and exploration.

Decon System for WNS

The FSCSP has also developed, with their BLM partners, a state-of-the-art decon system, which was deployed at the 2016 NSS Convention and will continue to be used for decon against WNS in the future.

Exploration Encompasses Conservation

As Val Hildreth-Werker stated, "The bottom line is: cavers are the stewards. First entry explorers and mappers provide the first line of stewardship... conservation starts at the beginning and continues far beyond restoration. Exploration through the Fort Stanton Cave Study Project is an outstanding example."





Jennifer Foote

Evelyn Townsend at work on some muddy cave velvet



Jennifer Foote

The same general wall area after cleaning



Jennifer Foote

Kevin Strong cleaning floor area



Jennifer Foote

Bruce Daily cleaning in the same area as photo on the left. Note the area at the top has been cleaned but the slope below in the foreground has not been cleaned.

FSCSP caver and Board member Pete Lindsley explains it this way: “Conservation is the basis of the whole FSCSP operation. We have worked with the BLM closely for many years, assisted with design and installation of a number of gates for decades, waited patiently on the government paperwork while EAs (Environmental Assessments) were written, worked with the New Mexico and Federal governments to establish the NCA to protect the resource, and cleaned up after other public caving trips.”

“The FSCSP has developed a process for conservation of the delicate Snowy River passage including training and careful selection of teams for these areas, and has monitored the process and updated it where required, including restoration trips to remedy damage caused by heavy travel in some locations.” continued Lindsley.

Currently the New Mexico BLM Cave

Management Team has limited visitation in Ft Stanton to a maximum of only 120 “tickets” per year. The cave is closed for half of the year to allow for the protection of the hibernating bats.

The Project submits a series of proposals for individual trips annually, with the top 120 entries ranked and chosen by the BLM to coincide with their most important goals. The most important goal listed is conservation of the resource. (FSCSP’s upcoming book, *12 Miles From Daylight*, will include many examples of cave conservation activities and images of this world-class cave.)

Thus, cave conservation is certainly an important aspect of this exciting web of relationships that create a beautiful mosaic of form and splendor. The Trophy Room is but one example of many projects that will no doubt unfold in the near future for Fort Stanton Cave and its 31-plus miles of cave

passage, including the spectacular Snowy River formation.

Author Lynda Sánchez is a retired educator and historian living in Lincoln County, close to Fort Stanton Cave. She has served on the FSCSP Board of Directors for eight years.

Photos are courtesy of BLM, FSCSP or the USFS. Photo credit lines as noted. Also view: <http://FSCSP.org/> or http://blm.gov/nm/st/en/prog/NLCS/FSSRC_NCA.html

The work illustrated here is a great example of the BLM and the FSCSP working together on this 5th-generation design. Fabrication and testing focused on protecting the bats from WNS in accordance with Fish and Wildlife regulations. Of course, we owe a great deal of thanks to Knutt Peterson (BLM Cave Specialist) who hauled the AD5K unit up to Ely and back to New Mexico. He also worked side by side with other volunteers at the convention as they assisted and trained the cavers in protocol for using the equipment. To learn more about the 2016 Special Decontaminator Project from New Mexico see: <http://FSCSP.org/AD5K>



Knutt Petersen shows the hinged cover of the 2 x 6 foot decon tank. The black tubing recirculates the hot water through the propane heater and sends it back with a thermal boost through the white tube.



The 5th generation hot water decon system was used at the 2016 Ely Convention.

Beer Bottles, Bats, and Building Cooperative Programs: Update on Montana's Lick Creek Cave

by Ellen Whittle, Ian Chechet, and Taylor Woods

During prohibition, illegal bars were termed speakeasies because their patrons were said to “speak easy,” or talk quietly, about them. Today, we no longer need to protect the location and contents of our bars, but we do need to protect our caves.

Montana cavers guard the locations of caves from the general public, and will typically guide newcomers to them rather than reveal cave GPS locations. This has been tradition for many years—however, in spite of this practice, a few caves have become popular and well-known destinations in our state.

Lick Creek Cave shows the impact that typically results when a cave's location becomes public knowledge. A short drive from one of Montana's larger cities and a half-mile hike from a road, the cave has been known by locals for decades. The relatively easy access results in 600-1,000 visitors per year. Lick Creek Cave is mostly horizontal and contains the largest known chamber in Montana, the football field-sized Cathedral Room, making the cave attractive to both cavers and non-cavers. Over the years, the cave accumulated candy wrappers, broken beer bottles, fishing line, and spent fireworks—and, sadly, the cave has been plastered with graffiti tags.

More Bats Than Expected in 2013

With about 400 caves throughout Montana, each with unique and specific conservation needs, cave management can be a consuming task for agencies like the US Forest Service or BLM. Lick Creek Cave was an eyesore to local managers, but it remained on the back burner until January of 2013. Northern Rocky Mountain Grotto (NRMG) member James Cummins agreed to lead a group of bat biologists, including zoologist

Bryce Maxell (Montana Natural Heritage Program; or MTNHP), into Lick Creek Cave for a winter bat count. The cave is a known hibernaculum, but it had not been fully surveyed for winter bat population in decades. Advances in LED light technology, along with small and portable super-zoom cameras, made it possible to spot tiny bats roosting in crevices on the high ceilings and walls in the cave's Cathedral Room. Prior to this survey, Lick Creek Cave was previously reported to host about 40 hibernating bats every winter; this time the team counted over 150 bats, placing the cave in the top 10 most populated roosts in the state.

Gating Controversy Leads to Cooperative Management

By November 2014, in a meeting between the USFS Region 1, bat biologists, resource managers, and NRMG executive officers, the possible gating of Lick Creek Cave was a contentious topic. At the time, groups like the Center for Biological Diversity were threatening large-scale lawsuits against the USFS for keeping their caves open in Region 1, with the claim that un-gated caves have a higher risk of spreading the fungus that causes White-nose Syndrome (WNS). While bat mortality has risen to over 6 million in the eastern half of the United States, the disease continues to spread among bats. Responsible cavers who comply with decontamination procedures felt that they should have a voice in the debates on gating caves, especially since some of the caves are not used by bats. In some areas, agencies don't have the personnel resources to monitor remote and vertical caves. Often, only the cavers have the skills and time to collect data from these caves.

By the end of the meeting, USFS and NRMG folks came to an informal agreement

regarding Lick Creek and other caves on public lands:

A. Grotto members agree to submit trip reports, monitoring and documenting any changes to caves they visit.

B. Agencies document actual numbers of visitors to caves, using cave registers and game cameras.

C. Agencies set out bat roost loggers, which monitor bat activity throughout the winter, in order to look for increases in activity following human visitation.

D. Grotto members install informative bat signs at or near the entrances of caves (modeled on a similar successful program in Washington State.)

E. NRMG assists agencies with an annual cave cleanup at Lick Creek Cave (or other similarly vandalized caves).

Since 2015, the game cameras, roost loggers, and cave registers have provided substantive data regarding cave visitation and bat activity. The game camera has recorded nearly 1,000 individuals visiting the cave during one year; the first real numbers that agencies can use to establish visitation numbers. The game cameras have also recorded mountain lions, bobcats, bears, deer, elk, and rabbits, sometimes following in the footsteps of the human visitors.

The game camera photos reveal that most usage of Lick Creek comes from the general public. Many people walk by without helmets or headlamps, wearing impractical shoes such as flip-flops. Others, more serious about their explorations, wear hard hats with flashlights taped on. And occasionally, there is an NRMG member with a cave pack, cave suit, and three sources of light mounted on their helmet—and they are usually carrying a full trash bag on their way out.



USFS employee Dan Siefert uses water pumps and wire brushes on graffiti. Photo by Dave Bobbitt.



Wildlife technicians Carrie Voss and Macy Dugan scrub graffiti. Photo by Ellen Whittle.



Interpretive sign installed at the cave entrance on a rock wall



The Cathedral Room is the largest underground room in Montana Photo by Ronan Donovan, courtesy Montana Natural Heritage Program.

Continuing Partnerships The NRMG's official cleanup, mapping, and resource monitoring efforts began in 2015. The Lick Creek Cave Restoration Project was organized by NRMG member Taylor Woods, and was sponsored by REI and Lolo Peak Brewing Company. For that event, the NRMG, Bigfork High School Cave Club, and University of Montana Cave Club partnered with the US Forest Service to spend an entire day scrubbing graffiti and removing trash from the cave. By the end of the day, volunteers picked up 100 pounds of garbage, installed interpretive signs, and scrubbed 50-70 graffiti tags with wire brushes. The high school cave club, led by Hans Bodenhamer, did a cartographic survey, which was transformed into a complete map of the cave's passages. The 2015 event was reported in the 2016 April Conservation Issue of the *NSS News*.

While we continue to "speak easy" about locations of most caves in Montana, we now proudly encourage all to help in the stewardship of Lick Creek Cave.

Successful Outcomes and Increasing Stewardship In 2016, a second annual cleanup project was organized to focus on biological and geological monitoring of the cave. Perhaps due to the informative signs or publicity of the previous clean-up, there was less trash to carry out, and most of the volunteers' time was spent scrubbing graffiti, which will likely never be fully removed. Since then, cavers have encountered local visitors carrying trash out of the cave, saying that they are worried that the cave will be closed unless the locals take care of it. Using the trip reporting system, Grotto members have begun to report seeing less new trash and new graffiti in the cave. The decision to gate the cave, at one time viewed as inevitable, has been postponed due to these positive results.

Lick Creek Cave is valued by many people, cavers and spelunkers alike. Hundreds of families visit the cave each summer, including many parents who visited the cave in their youth and now want to share the experience with their children. Public

outreach and interpretive signs seem to have helped well-meaning visitors to understand the fragile nature of Lick Creek Cave. While, in the past, some have pointed to Lick Creek Cave as a "sacrificial" cave, it should instead be seen as a valuable opportunity to educate the public about the preservation of our wild caves.



Lick Creek sign outside cave entrance



Bryce Maxell returns a bat to its roost. Photo by Ronan Donovan, courtesy Montana Natural Heritage Program.



Cleanup crew in 2015, Photo by Ellen Whittle.

A Revelation Regarding the Federal Cave Resources Protection Act of 1988

Steve Knutson

In the 1980s some prominent cavers got an act submitted to congress in an effort to protect caves on federal lands. This act seemed to be a cave conservation milestone, possibly similar to the Environmental Protection Act's effect on the environment. This was passed in 1988 and was generally welcomed by cavers. The initial statement of the Act is as follows:

a) FINDINGS—The Congress finds and declares that—(1) significant caves on Federal lands are an invaluable and irreplaceable part of the Nation's natural heritage; and (2) in some instances, these significant caves are threatened due to improper use, increased recreational demand, urban spread, and a lack of specific statutory protection.

(b) PURPOSES—The purposes of this Act are—(1) to secure, protect, and preserve significant caves on Federal lands for the perpetual use, enjoyment, and benefit of all people; and (2) to foster increased cooperation and exchange of information between governmental authorities and those who utilize caves located on Federal lands for scientific, education, or recreational purposes.

(c) POLICY—It is the policy of the United States that Federal lands be managed in a manner which protects and maintains, to the extent practical, significant caves.

The FCRPA of 1988 was encouraging to cavers, especially to those of us in the west, where most of the caves are on public lands, usually federal—BLM, USFS, or NPS land managing agencies. It really looked like a new era of federal cave management and agency cooperation was dawning. But the passage of time has shown otherwise.

As of this writing, I am involved with caves located in national forests that have no finalized cave management plan. The Marble Mountain Wilderness Area of northern California, with some 32 miles of mapped cave in an area only about 1.5 miles square, is surely the greatest concentration of solution caves west of the Rockies. But it has no management plan. It is now almost 30 years since the FCRPA was passed.

Clearly, one must have patience. Continue to talk to the agencies. The Marbles caves at least have natural protection; they are 5 miles or more from the nearest road and entrances almost always lead to vertical drops or protracted crawlways. They are not well known except to the sparsely populated locals around the wilderness area.

Last winter I learned of the Ape Cave situation. Ape Cave is a lava cave now in the Mount St. Helens National

Volcanic Monument. It is somewhat famous, for a long time being the longest and deepest lava cave in the US. I had been concentrating on the Klamath Mountains of southern Oregon and northern California, and deliberately keeping ignorant of other NW problems.

I was amazed. The USFS (St Helens is a National Monumnet of the USDA-FS) reported Ape Cave receives 150,000 visitors per year, and that "year" is only April to November, due to snow closure in the winter. The agency was looking to modify its recreational area plan (which includes Ape Cave) to try to restrict this visitation, and called for a meeting with local grottos and the entrepreneurs that might be affected. The cave was apparently suffering such accumulation of trash and graffiti that the agency felt the visitor experience was suffering. What? What about the cave itself?

I was fairly blown away by this situation. I started looking into it.

Ape had been declared significant not long after the FCRPA passed. In 1984 Dr. Clyde Senger, a speleobiologist, did a bio survey of Ape and adjacent caves. The survey found numerous cave-adapted species, mostly invertebrates, and he found the cave severely degraded by visitation. At that time it was just a few tens-of-thousands of visitors a year. By 1992 it was estimated at 120,000. This apparently has slowly increased to today's 150,000.

I admit I was a bit outraged. Ape Cave hadn't seen an ounce of protection from the hordes visiting it annually. There was no daily or occasional agency presence at the cave at all, even at the booth for buying a parking permit. It was automated. Some years ago, when FS parking was overtaxed by the Fee Demo Program, they didn't use that as an easy way to limit cave visitation, but rather, expanded the parking lot. What happened to the FCRPA? What happened to "secure, protect, and preserve significant caves"? I was due to find out.

On two prior occasions, some years before, I had become similarly outraged, and in despair had sought legal help for cave protection. I knew it was going to cost me, but I was mad and determined. I learned much. Both of those cases involved agencies ignoring NEPA, the National Environmental Protection Act. I talked to them first, of course, to no avail. Both were determined to proceed without NEPA.

My initial legal contact was one of our grotto members who was a lawyer. He granted me some pro bono time, and we

discussed the situation. He considered filing an injunction against the NEPA-less action, in this case being by the NPS at Oregon Caves NM. But he advised me to seek an environmental lawyer, who would know better what route to take.

I contacted the Sierra Club legal arm, and was told they were far too busy. They recommended CRAG, the Cascade Resources Advocacy Group, then working out of Tacoma, Washington. They asked for the details, and when they got them, said they would take the case, half price.

In for a penny, in for a pound ... and I was still mad. Apparently, there was confusion regarding agency obligation to NEPA. The interesting thing was, as soon as legal proceedings started, Oregon Caves suddenly announced they would do an EA on the proposed action. Whoa! That was a surprise to me at least—probably not to the lawyers. I had won, at little cost. The agency had no embarrassment since there were no court proceedings.

I had learned a big lesson—you can go with proposed court action but as soon as you do, the agency, knowing it is in violation and will lose, reverses course.

I applied what I learned to my second action against the USFS, which wanted to fill a vertical entrance dig with polyurethane foam—thus, putting toxic material into a karst aquifer. I explained the situation to the district ranger but he only reversed course after I set a local environmental lawyer on it. I was 2-0!

The blatant trashing of Ape Cave, for decades, also made me mad. So I went the same route. CRAG was busy and recommended the Western Environmental Law Group, in Portland. I gave them the details, and that the FCRPA would be the applicable law. My contact seemed enthusiastic about it. But a week later, I was dismayed to get a call from her, telling me to forget it because the FCRPA was useless in such an action! What? Not usable to protect a significant cave from such abuse?! That's right—of no use.

Refusing to be satisfied, I sought a second opinion. That was the Center for Bio Diversity. They have a reputation of being rabid dogs in pursuing environmental action against federal agencies. This is the group that a while back entered a petition to start action to close all federal caves for the purpose of stopping WNS spread. That failed, but since then they had contacted me, and presumably other cavers, for knowledge of any violations of the FCRPA. This was for the purpose, they said, of putting "teeth"

into that law. I didn't really know what that meant, obviously legal action, but the specter of cave closures loomed and everyone I talked to said in essence; don't trust the CBD, so I gave them nothing.

When I contacted them, they also said, forget it. The FCRPA, they had already come to realize, was useless.

What this all says, is that the FCRPA

doesn't actually REQUIRE an agency to do any cave management or protection. I can't say how disappointing this is. I can't recall how many times I have said such-and-such agency is required by law to do cave management and protection. I have heard other cavers say the same thing. I have seen no evidence that this is correct.

So we come to the purpose of this piece. The business of talking to, trying to cooperate with, and cajoling an agency into cave management action is the ONLY course one can pursue. We are back to square one. We need laws that actually work in our real world to protect and conserve caves and their contents.



NSS Conservation Task Forces

NSS CTFs make a difference in karst areas around the United States. Since passing of the Federal Cave Resources Protection Act of 1988, many CTFs are recognized by public lands agencies as primary representatives of the caving community on conservation issues in their areas. A Conservation Task Force (CTF) is a great way to gather like-minded people and make good things happen in cave and karst conservation.

Some CTFs have a specific project that may take a year or two to complete. Or it may be an ongoing project that continues and maintains conservation for many years. A CTF may tackle a significant cave vandalism problem, or it may work alongside private landowners and civic leaders to clean up a groundwater pollution source. Any cave/karst conservation or protection concern fits.

Due to the ongoing efforts of CTFs, caves are mapped and inventoried. Management plans are implemented. Members of CTFs are helping to manage caves on behalf of public and private landowners. Restoration and cleanups happen—cave habitats are restored. In some areas more caves are being restored than are being vandalized. Cave locations revealed on the Internet and through Social Media are disappearing because cavers are catching it and addressing it and getting it offline—Conservation is gaining!

The newest NSS CTF, Washington Cascades Bat Conservation Task Force (WCBatCTF), addresses bat conservation and research, especially in the Northwestern states. WCBatCTF is well underway, recently organized by long-time caver and NSS member for over five decades, William R. Halliday, MD, with the support of renowned bat expert Merlin Tuttle.

Check out Merlin Tuttle's 2017 Blogs posted on <http://www.merlintuttle.com> where he strives to teach the world "to understand and appreciate the vital contributions bats make to human beings and the world we live in." **How Disturbance**

Harms Hibernating Bats <http://www.merlintuttle.com/resources-2/disturbance-harms-hibernating-bats/> and **Bat Flash!** <http://www.merlintuttle.com/news-blog/>

Join an existing CTF <http://caves.org/committee/conservation/CTFS.shtml>

Establish a New CTF Create an NSS Conservation Task Force to focus on local, regional, national, or international cave and karst conservation issues. If your work would benefit from CTF designation, contact the NSS Conservation Division, Val Hildreth-Werker: werks@cunacueva.com

Bat Ball Trip Report

The idea of a New Year's member appreciation dinner / fundraiser / party at NSS HQ was spawned at Cavefest in a late night fireside chat between Leigh Dudrow, Maureen Handler, and me. A week later I was talking with Bill Jackson (fundraising chair of the NSS). When I asked Bill if we could throw a party for members, showcase the new HQ, and maybe make some money to pay off the mortgage, his immediate reply was: "of course we can Fenn, we are the NSS."

And we were off. Most of you reading this already know what it takes to plan a party for cavers. It's like a cave trip. You don't want to leave anything out so you try to prepare as much as possible for the type of cave you are going to visit. We started from the beginning with the idea to keep it simple, it's our first one.

My brother Tyler Newton and I arrived on Wednesday before the party to prepare the place for arrival of our friends. We set up our camp and started to work. By Thursday we were set and by Friday morning the trip began. People stated rolling in, campers, tents, smiling happy faces everywhere and then the cool things started happening. Trees were rigged for vertical practice, a firepit was placed near the entrance to HQ and people gathered. After dark some started watching the Friday night movie. *As Above so Below*. Whew, scary!

On Saturday almost everybody went caving, whether vertical or horizontal.

This is where things got surreal for me

because there were so many things to get done and the many people who had told me that they would do them started showing up. A few brave souls stayed behind to get the ballroom ready for the evening's festivities. All of a sudden the place was set up and decorated and the caterer was pulling up. My boiled peanuts were three hours from being done, I had been boiling five pounds for four hours already. There were five gallons of home brew brought by Mr. Birthday, Sydney B. Grindle. Not only did he bring the brew, he bartended on his own birthday. True Bad Assery! The caterers set up feeding stations and hungry cavers ate from 6 to 8 and then the lights went down and my lips are sealed on the details of the rest of the night and (unless you were watching on the web cam) we celebrated the New Year of 2017 in a civilized cavers' style!

On Sunday there was breakfast and vertical practice in the out building. Some headed home and others wandered into the caves on the property.

Results

- 70 happy party goers
- 2 new regular NSS members signed up
- 1 family membership signed up
- \$ raised to help pay off mortgage

Fennigan T. Spencer
NSS #66177

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NSS Conservation Announcements

Submit Abstracts for Conservation Tuesday at 2017 NSS Convention in Rio Rancho, New Mexico June 19-23

Calling for presentations, PowerPoints, workshops, or panel discussions to fill our NSS Conservation Tuesday. Please send Val Hildreth-Werker a quick e-mail now of your intent to present: werks@cunacueva.com

We invite abstract submissions for any Cave or Karst Conservation talks addressing stewardship, cave management, or restoration. Send abstracts by April 1, 2017 to werks@cunacueva.com

Limit abstracts to 250 words or less. Include title of your presentation and the authors' names, professional affiliations, mailing addresses, and e-mail addresses. For later publication in the *Journal of Cave and Karst Studies*, abstracts must draw a conclusion or explain the upshot of your study or project in a concluding sentence.

Equipment will be available for PowerPoint presentations. Please make special arrangements with us for any other media-viewing equipment. For online details about sessions and abstracts, visit the NSS Convention Web site: nss2017.caves.org/

Cave Conservancy Roundtable at NSS Convention

The Twentieth Annual Cave Conservancy Roundtable is scheduled at the 2017 NSS Convention on 23 June 2017, Friday starting at 1:00 PM. The theme is "Working to inspire future conservancy leaders to acquire the knowledge and skills needed to serve and to meet future challenges; to motivate cavers and environmentalists to participate in the conservancy's work; to build infrastructures of support in relevant communities." The Roundtable is usually on Friday, followed by the meeting of NSS Nature Preserves, with Tom Griffin presiding. Every caver who is a member of a cave conservancy is invited to participate in the Roundtable. All NSS members are invited to participate in the Nature Preserves meeting. Check NSS Convention Website updates for exact time and place: nss2017.caves.org/

Group and Grotto Cave/Karst Conservation Awards

Now accepting nominations for Grottos or Groups in recognition of conservation activities.

The NSS Conservation Division offers two annual awards recognizing conservation efforts of Groups and Grottos. Winners will be announced at Convention, receive a certificate, and have their names posted on a permanent plaque displayed at NSS Headquarters.

Candidates for the Group conservation award may be any of the following: an NSS Conservation Task Force, NSS commission, committee, subcommittee of a committee, division, conservancy, expedition, project, region, section, survey, taskforce, affinity group, institutional member, or a subunit of any of the above. An Internal Organization IO, Group, or Grotto to be nominated for these awards should be in good standing with the NSS. For more info, see the NSS Conservation Web pages <http://caves.org/committee/conservation/conservation-awards.shtml>

For consideration for either of the two 2017 awards, please send a letter of application or nomination summarizing your contributions to cave or karst conservation, along with supporting documentation and letters of support.

Please send nominations to the Conservation Committee Awards Chair, Kathy Lavoie by May 31, 2017. lavoiekh@plattsburgh.edu

Victor A. Schmidt Conservation Award

The annual Victor A. Schmidt Conservation Award recognizes one NSS member who, over time, has demonstrated outstanding dedication to the conservation of caves. Nominations for candidates are solicited by the NSS Awards Committee. The recipient will be approved by the Board of Governors upon recommendation of the Awards Committee.

The recipient must have been a member in good standing of the Society for at least two years immediately prior to his/her name being submitted as a candidate. The Awards Committee shall give preference to candidates who have not received the Outstanding Service Award or Honorary Membership.

To nominate a caver for a the Victor A. Schmidt Conservation Award, please send complete resume and nomination letters describing the caver's contributions to cave/karst conservation over many years. Send nominations by November 15 each year to:

Bob Vandeventer
vandeventerbob@netzero.net
317-888-4501
525 Lawndale Drive
Greenwood IN 46142-3904

Save-the-Caves Conservation Grant

The Conservation Committee is authorized to award up to \$5,000 annually from the Save-the-Caves Fund to make grants of up to \$1000 to Internal Organizations, Conservation Task Forces, Conservancies, or to individual NSS members for specific projects that involve cave or karst conservation, restoration, cleanup, or outreach.

The Conservation Committee is responsible for establishing the application, review, and award process. Recipients of these grants shall submit written reports to the Society as stipulated by the Chairman of the Conservation Committee. To be considered for a grant award, applications must include adequate description of one or more of the following:

- scientific investigation of cave or karst conservation problems;
- speleological research that will directly contribute to cave or karst conservation;
- remediation of ecological problems in cave, karst, or pseudokarst areas;
- hands-on, in-cave efforts to restore cave passages to a former ecological state;
- equipment and supplies for conservation or restoration projects that include hands-on participation from cavers;
- or public outreach to inform and raise awareness of cave and karst values.

Conservation Grants are awarded throughout the year, subject to availability of funds and number of applications received.

Save-the-Caves Conservation Grant Application Process

Awards are based on the nature of the project and available funds. For relatively uncomplicated grants to NSS members and activities, send an e-mail application that includes the following points. Institutions and foundations should submit the more formal NSS grants application (insert link). Priority is sometimes given to conservation projects that provide quantitative research data. Please specify in your application:

- who the applicant is (name, address, telephone number and other contact information)
- who the official grant recipient is to be (name or organization, title, address, etc.)
- what, specifically, the project and/or research will entail
- what benefits are expected

- when the work is to be done
- dollar amount being requested from the NSS, including how that money will be used
- a statement assuring the NSS that an article for publication, video, powerpoint, presentation, and/or other comparable account of the completed project or research will be provided in a form accessible to the membership to account for expenditure of NSS funds

Please call or e-mail the Conservation Grants contact person if you need more information.

Val Hildreth-Werker
P.O. Box 207
Hillsboro, NM 88042
(575) 895-5050
werks@cunacueva.com

NSS Conservation Web Pages and Cave Conservation Facebook Group

All things caving encompass conservation. The NSS Conservation Pages are online at caves.org/committee/conservation/

We welcome input. Send to Val Hildreth-Werker werks@cunacueva.com

Through the efforts of John Durall and John Wilson, we also have a Cave Conservation Facebook Group for cavers across the speleo spectrum! It's a broad, quick, all-in-one, easy spot on Facebook to serve the global caving and cave-interest communities! Join us, add members, repost, and share the site.

<https://www.facebook.com/groups/257740784385806/>

Caving is about deliberate conservation choices!

Every trip we take

Every station we set

Every step we place

Every speleo detail we learn

Whether well-intentioned faux pas ...

Or state-of-art-and-state-of-science

Every cave or karst decision ... good, bad, or ignorant ...

For better or for worse ... it's all about conservation!

Stewardship choices always kick in along the way. All of caving is about choices and acts of conserving! So let's make this Facebook Open Group Space work for us all!

Support Cave Conservation: Donate to Save-the-Caves Fund

The caves, cavers, and the NSS appreciate your financial support!

Contributions are tax deductible, of course!

Please specify Save the Caves—find fourth item in list after you click on blue link Donate via our online donation

form: <https://caves.org/nssapps/donate.shtml>

Donate via a PDF that can be completed online and mailed or emailed in.

<https://caves.org/donate/Donate.pdf>

Use the comment area provided in links above to include a special note.

Make a special tribute to a friend or loved one with your Save-the-Caves Donation in Honor or in Memory. Your gift could look like this:

The National Speleological Society

has received a gift in memory of

C.K.Void and in honor of

our friend **Karsten Caver**

With this gift, caves of our Earth will

receive

conservation, restoration, and

protection.

Save The Caves!

Your name

Your address

Mailing address:

The National Speleological Society

6001 Pulaski Pike

Huntsville, AL 35810-1122 USA

(256) 852-1300

nss@caves.org

NSS Conservation Network

The **NSS Conservation Network**

is an e-mail resource expressly developed (at the request of Val and Jim) to quickly disseminate important and often 'short-fused' conservation-related updates to IOs and interested individuals. Send info bursts to werks@cunacueva.com and stevensmith@usa.net

Notices are sent out on an 'as needed' basis, with often with months between send-outs to IO Conservation Chairs (or overall Chair if the IO doesn't have a Conservation Chair), and to any individual caver who asks to be on the Conservation Network addressee list.

NSS Internal Organizations! Please keep me informed of new personnel or e-mail addresses.

Send me a note if you want to keep a finger on the pulse of important conservation issues that affect us all. Steve Smith, Coordinator—NSS Conservation Network stevensmith@usa.net

NSS Conservation Regular and Conservation Life Memberships

Gift the caves and yourself ... or gift the caves and honor a friend or relative with an NSS Gift Membership! Any type of Membership can be gifted. Find all NSS Member categories at <http://caves.org/info/membertypes.shtml>

Regular Gift Membership – 18 years and over; full membership privileges, including an **electronic** subscription to the NSS News for a total of \$35.00

Conservation Regular – combines a Regular NSS membership with **electronic** NSS News, plus a donation to cave conservation, to total \$135.00

Conservation Life – goes to endowed funds for Life Membership in the NSS (\$900) plus a \$1,000 donation to cave conservation, totaling \$1900.00



Life and Conservation Life members receive this pin.

Send an Article for the Next Annual Conservation Issue of the NSSNews!

Submit articles for our Annual Conservation Issue each year before New Year's Eve!

Please send a note NOW to werks@cunacueva.com if you plan to submit.

The annual conservation-focused issue of the NSS News accepts articles and photos, protection concerns, editorials, updates, cave/karst conservation activities, conservation opportunities, and appreciation/kudo pieces highlighting individuals and groups.

The Conservation Issue provides an overview of worldwide conservation research, projects, outreach, evolving current best practices, and networking efforts. Val Hildreth-Werker serves as Conservation Editor for the NSS News. Send submissions to Val at werks@cunacueva.com by January 15, 2018 (Drop-dead-line!)

- We include conservation pieces from one paragraph to several pages.
- Please do not exceed 2500 words (or a 15,000 characters+spaces count).
- Send only text in Word docs. Include captions and bylines, but no photos in Word doc.
- DO NOT embed or place images into Word documents!! Send as separate files.
- Send images as tiff or jpeg files to werks@cunacueva.com AND davebunnell@comcast.net
- Send maps and illustrations in PDF format.
- Please follow the NSSNews Submission Guidelines and Style Sheet <http://caves.org/pub/nssnews/style.html>

AVP Corner

Katherine L. Crispin, Ph.D.

In what I hope becomes a semi-regular feature of the *NSS News*, welcome to my corner of the organization, Department of the Administrative Vice President. It is altogether fitting that I use this issue for my inaugural column. Those unfamiliar with the NSS internal organization chart may not realize that Conservation is one of the Divisions that falls in the AVP Department. AVP also is responsible for three other Divisions: Cave Management, Education, and Convention.

Today I'm going to give a brief overview of the Department, the four Divisions, key personnel, and introduce myself. I also will be sharing my vision for this Department and the Society in general. Future columns will share success stories, ways in which your involvement in the organization (volunteer and/or financial) has advanced NSS outreach to the greater world, both on the local scale all the way up to international.

The Administrative Vice President Department oversees dozens of committees, commissions, conservancies, projects, and conservation task forces. Dedicated, hard-working volunteers serve in all of these roles.

The Society is a very diverse machine with many moving parts and none of the work would get done without you. Thank you for all you do.

The *NSS News* issue that you hold in your hands is edited by Val Hildreth-Werker, the Division Chief for the Conservation Division. Val and her husband, Jim Werker, have served my predecessors very capably over many years—I am grateful that they agreed to remain in this role to provide a knowledgeable resource and keep the Conservation Division running smoothly. Thank you Val and Jim.

I have benefitted from three other Division Chiefs with vast institutional knowledge. John Wilson serves the Cave Management Division. Key areas under John are Landowner Relations, chaired by Julie Schenck-Brown, and the NSS Nature Preserves (see article on page 5), chaired by Tom Griffin.

Carol Tideman serves the Convention Division—much work goes on behind the scenes to bring the NSS Convention to life each year and Carol does a lot of work.

New to the Education Division is Mike Hood. Many of you may recognize Mike's name as a past NSS President. I am extremely grateful that he agreed to serve to help bring cave education once again to the

forefront. Thanks to all of you for all you do in serving the NSS.

When I was first approached about taking on the role of Administrative Vice President, I was hesitant. I knew that it would involve a huge commitment of both time and effort, and to a lesser extent, money (we are volunteers, after all). If I was to commit to serving in this position, it had to fit my passions and I needed to spell out my vision as to what I see as the function of the Society and how I could facilitate that vision being accomplished. I also knew that if I was going to commit, it would be for the long haul.

The passion was easy—I care about science, I care about conservation, I care about education (and outreach), and I care about protecting cave resources for future generations. The AVP Department fits each of these. I agreed to put my name forward for AVP and the Board of Governors confirmed my appointment.

But who am I? Few on the Board of Governors knew me personally before my name was submitted. I know that most readers of the *NSS News* also have never met me. So, here is a brief introduction. Growing up in NE Ohio, there are few true caves. I spent much time crawling into various holes, or “mini-caves” in Cuyahoga Valley National Park. My parents also took me to various federal caves. Wind Cave, Jewel Cave and Mammoth Cave occupied my mind—I wanted to wander “off trail” but was not permitted to go on the wild tours. I spent many, many nights watching bats fly through our large backyard and went to college with a mind to study wildlife management with a focus on bats.

Fast forward quite a few years to Allentown, PA. In the mid-90s, I stumbled on Greater Allentown Grotto, who were more than happy to show me the ropes and take me underground. Although a late-comer to caving, I whole-heartedly embraced it and also joined the NSS (#51841), got involved in project digs, Mid-Atlantic Karst Conservancy, speleohistory, and cave science through the Geological Society of America. I have a Ph.D. in Geology, focused on mineralogy, diffusion studies, and micro-analysis. Currently, I am a Staff Scientist at Penn State where I interface with researchers across more than 70 departments.

Over the years, I have found myself getting more involved in cave organizations. I belong to several grottos, regions, and conservancies. I am a life member of MAKC. I am extremely involved in The Robertson Association (TRA) and Old Timer's Reunion (OTR). I am an elected Trustee of TRA

and co-chair of registration for OTR. I am the TRA Ombudsman, which involves me trying to help people who have complaints with TRA or OTR,



usually involving problems getting memberships approved or questions about how or why something is currently set up. I serve on the Grants Committee of the TRA. I am the Outreach and Growth Coordinator for TRA, which is head of a committee I created two years ago to reach out to potential new members and interface with the growing presence of online discussions.

I am passionate about reaching out to potential new members of both TRA and NSS in order to increase our membership base so that we are vibrant and healthy organizations for years to come. I visit college caving clubs, which are usually not NSS-affiliated, and try to get them in touch with area grottos and encourage them to attend OTR, where they can meet a bunch of cavers who can help them become more responsible cavers themselves.

How do my passions fit the NSS, and especially the AVP Department?

Let's start with Conservation and Management, which often go hand-in-hand. If we do not take an active, very strong position on conservation of caves, these unique, beautiful realms will cease to exist. We need to be forward-thinking in preserving and protecting these environments for generations to come. We also need to work closely with landowners to foster good relations. Landowners of caves not directly under NSS or other cave conservancy protection should be able to approach the NSS for assistance with access and conservation policies. The NSS should work closely with scientists and organizations working on bat research and conservation. Too many of our bat friends are becoming endangered, both due to WNS and other factors. Exciting research is coming to the forefront in combatting WNS and the NSS should help support this research where possible.

Education is a huge priority—if we do not spend time, money, and effort on educating the next generation of cavers, we will find ourselves not only part of a dying organization, but at the mercy of the greater world who do not see or know the importance of karst environments. Not only should we be

educating youth to be responsible cavers, through great efforts such as the JSS, but we need to spend a lot of effort educating the public regarding caves, karst, and bats. Co-sponsoring public lectures or publishing education materials is something we need to continue pursuing as a high priority. The Luminary Talks are an excellent example of a fantastic outreach in which the NSS accomplishes this—not only do other cavers learn from the “superstars,” they are also accessible to the public so that interested parties can learn about science and exploration of cave environments. Continuing to develop the educational programs that can be distributed to school children is another area where we can reach out to youth of today to help make them into responsible cavers and/or scientists of tomorrow. Maintaining and developing education content accessible from our website needs to be added and polished. We should be the “go-to” authority on all things cave-related.

Working with commissions such as NCRC and Vandalism Deterrence is also critical to education, conservation, and outreach. The NCRC interfaces on local, state, and national levels with the public entities responsible for situations requiring rescues. The Vandalism Deterrence Commission plays a critical role in conservation as they pursue those actively destroying irreplaceable cave resources. These commissions elevate NSS in public presence and perception.

The NSS Convention is where our members (and non-members) can interface in all the various areas relating to speleology. It doesn't matter whether your passion is exploration, hydrology, geology, history, biology, or any of dozens of areas relating to caves—you can find it at Convention. We, as a membership, get together once per year to see what has been going on in all the various disciplines. Members also get a chance to show off their creative side in the salon section or exercise their competitiveness in the contests. And, of course, it's a great time to socialize with your fellow cavers.

My vision for the AVP Department and the NSS as a whole:

1. BE THE NUMBER ONE SOURCE FOR INFORMATION ON CAVE CONSERVATION TO THE PUBLIC. When somebody googles “cave conservation”, our website should be the first result (it is). We should have a wealth of information available covering a multitude of resources. It should also be easy for someone to reach a “real person” via email if they have questions.
2. BE THE NUMBER ONE EDUCATIONAL RESOURCE FOR CAVES AND THEIR ENVIRONS. We need to revamp the website to make it easy for educators or the

simply curious to find basic information on “what is a cave”, “what lives in caves”, etc. We should not be linking everything to outside sources, but become the source. [Ed. *Check out the links under Caving 101 on the NSS home page*].

3. BE THE “SMILING FACE” FOR LANDOWNERS OF CAVES. Multitudes of caves are accessible only through private owners. If we maintain good relations, our access should remain intact. It takes very little effort to shake the owner's hand and say “thank you”; take a few seconds to send the owner a picture taken in their cave; send a Christmas card; sit on their porch and have a beer after the trip. Above all, ask permission before entering the cave, even if “they don't require it” has been the unwritten policy. These little gestures mean so very much. We need to recognize our good landowner relations where we can. As such, there are now two official NSS awards for this very thing and a Landowner Relations Network Committee is now in place for interfacing between the NSS parent organization and grottos, conservancies, and/or individual landowners.
4. BE THE ULTIMATE RESOURCE FOR PROTECTING CAVES. Whether this means aiding a landowner in addressing concerns about access or helping a local township on developing an access policy or assisting regional conservancies on purchasing new caves, the NSS needs to put into practice the words on the front page of our website: “We Explore. We Study. We Protect.” In

some cases, the NSS may consider purchasing caves to add to our growing list of Preserves. In other cases, it may be contributing \$5000 in grants towards the purchase of a cave by a conservancy or buying supplies to help a grotto with a study of a local cave.

5. BE THE STRONG HELPING HAND FOR TIMES OF CRISIS IN CAVES. The NCRC needs to be the face shown to the world for cave rescues, which often result in media coverage either locally or nationally. Volunteers put in countless hours to “bring them home” when the worst has happened. This is when the NSS shines in the spotlight. During cases of vandalism in any cave—the reward available through the Vandalism Deterrence Reward Commission might be the nudge that is needed to find the perpetrator.
6. BE A LARGER RESOURCE FOR SCIENTIFIC STUDIES OF CAVES, KARST, AND CAVE BIOTA. We should strive to give more grants for studies relating to caves, especially for those outside the membership. For example, there are a number of studies that have been recently published on WNS, for which we could have provided funds to aid the research. But we need to actively publicize our available grants to the greater community, not just our own members. After all, we are a non-profit scientific organization.

Stay tuned, folks. I plan to be here a while to see us blossom into an even better version of ourselves. Comments, thoughts, suggestions, donations, volunteers are always welcome. Contact me at avp@caves.org

Convention Bids Sought

The NSS Convention Division is looking for groups/grottoes/regions to host NSS Conventions for 2021 and beyond. You don't have to create the event from scratch. There is guidance in the form of the *Convention Manual* (available on the NSS website) and the Division has a staff of subject matter experts available to assist you with those functions that are not already handled by other groups. We do invite you to put your own local flair on the event. Select which caves you are willing to make available to convention attendees. Show off your local attractions. Invite members of your extended caving family to visit a new area.

Many Conventions are hosted by cavers from all over. Go-to meeting and web conferences and e-mail allow virtual meetings and instant communications. No longer does all the staff need to be local to the site. Small grottoes can get staff

from their region or from other parts of the country.

If you are interested or want more information, please contact Carol Tideman ctider@ymail.com or call 410-72-0742 in the Eastern Time Zone.

Help the NSS Find New Officers

The NSS Executive Search Committee is currently looking for a few connected cavers to join the committee. The committee searches for qualified candidates to run for NSS officer positions. The NSS directorate then interviews and elects from those running. We need committee members from across the country.

If you know a lot of people, regularly go to caver events or are in contact via social media with people you believe would make great leaders of the NSS, please consider becoming part of the committee. To join or for more info, please contact Carol Tideman ctider@ymail.com

2017 National Cave Rescue Commission Seminar, Redmond, Oregon

June 17 – 24, 2017

Eddy Cartaya

The Seminar

The National Cave Rescue Commission (NCRC) is a charter of the National Speleological Society. Its primary function is to develop curriculum and deliver intensive seminars in cave rescue techniques. Each year, the NCRC hosts a national seminar, where all levels of training are offered during the same week. This year, the Pacific Northwest Region of the NCRC is hosting the national seminar in the spectacular Bend / Redmond area of central Oregon. Nestled at the feet of the Cascades Mountain range and bordering the alpine desert, Redmond is a unique playground for all things outdoors, be it caving, climbing, mountain biking, kayaking, hiking, etc.

The national seminar is a true immersion into cave rescue training. You get about 100 hours of the best training in the country packed into seven and a half days. The courses cover all aspects of cave rescue, from cave environment, cave hazards, medical, patient packaging, litter movement, rigging, vertical problems, cave communications, incident command system, leadership, etc. Level 1 prepares students to serve as a team member in a cave rescue incident. Level 2 prepares students to serve as task force leaders and tackle intermediate rigging problems. Level 3 trains students to manage cave incidents and solve highly technical problems from high lines, minimal gear rigging, and water problems. Team Operations and Field Exercises (TOFE) is a special opportunity to

spend virtually every day in the field doing nothing but solving problems in cave rescue. At the end of the week, all four levels come together and participate in a super realistic cave rescue scenario that goes the entire day.

So who should take these classes? These courses were originally developed for cavers by cavers. Even if you never plan to serve on an organized rescue team, these courses make you a safer caver, and offer techniques that you may be able to use to get your own team out of trouble, without ever needing to call for a rescue team in the first place. Of course if you *are* on a team, or want to make yourself available to help out at a cave incident in your area, this is the best way to get the standardized training to make you an even more valuable resource.

Course Costs and Logistics

The seminar costs \$675.00. This covers eight days of training, all your meals (served on site), and your camping area. The course is being held at the Deschutes County fairgrounds, at the Expo Center. Check out this link to see more about it: www.expo.deschutes.org Camping is on a grass field next to the rope gym, and is in walking range of modern bathrooms and showers. All classroom sessions will be inside the huge climate-controlled building. All meals will be served here as well.

The Redmond Airport (RDM) is virtually next door to the venue, so this is where you want to land if you plan to fly here. The Oregon High Desert Grotto will arrange transportation shuttles to ferry students to the site. The closest major airport is Portland (PDX). It is about a three-hour drive to Redmond from there. Transport from Portland will be at your own expense. See registration page at www.NCRC.info for information on shuttles and other options.

Tents are available for rent. Also, there are RV sites next door to the venue. For those wanting more plush accommodations, several hotels are right outside the gate to the fairgrounds. Grocery stores, Walmart, and restaurants of all kinds are also just a few minutes' drive outside the gate. See registration site for all the details and links.

Plan for an average high of mid to upper 70s degrees and an average low of mid to upper 40s. That said, June is kind of a wild card month. It can hit 90 degrees for a day or two, or go down to the upper 30s, depending on fronts. Relative humidities are low. The air is very dry. Plan to have lots of water with you.



2017 Logo by Rick Speact

Depending on the winter snowpack, there *could* be small patches of snow near some of the higher caves we may use. The caves are higher in elevation than Redmond, so expect cooler temperatures near them.

Days are long in June, due to our high latitude. It starts to get light around 4:45 AM and doesn't really get dark until after 10 PM.

About the Caves

There are about 700 caves in the area of the seminar. Central Oregon Caves are mostly lava tubes, varying in complexity from a single borehole a mile long, to three-dimensional labyrinths that can get you hopelessly lost. The average temperature in the caves are mid to low 40s. Cave elevations range from 3500 to 6500 feet. Caves



Brent McGregor

Eddy Cartaya and Kara Michealson engaged in pick off training in Bessie Butte Pit



Brent McGregor

McKenzie Pit complex, with 7 interlaced pits ranging from 95 to 165 feet



Robin Ryan Photography

Smith Rock State Park, Redmond, Oregon. Site of cliff training for the seminar



Brent McGregor

Eddy Cartaya in a tight sand crawl in Cody Borehole cave

are generally dry. None of the seminar caves will have water. It is possible there could be ice floors in a couple of the caves. Many of our caves serve as cold traps and hold ice year round. Some of the caves have very soft sandy floors, and crawling through those areas is like crawling on a beach. The average pit drop for seminar caves is about 35 feet. There are a couple of exceptions for the higher course levels, which sport pits ranging from 95 to 170 feet. These are usually open vertical conduits (OVC) which are essentially volcanic shafts that lead down to large chambers and often complex passages. We also have some rather deep fissure caves, which a couple of levels will use.

Caves are mostly roadside... virtually no hiking, and where you do, it is flat. Most entrances are characterized by sinkholes with small, tight collapse entrances that quickly open up into large passage. In many caves, the tightest spot is getting through the steel gates. Drive to the caves from the venue vary from 25 minutes to 45 minutes. A couple of the caves for all-day exercises are about one hour. Redmond Caves is across the street from the venue.

Many folks have called me asking with great concern if their gear is going to get

shredded or destroyed by the lava. It is true lava rock is more abrasive than limestone, but unless you plan to wear a wool sweater caving here, your standard caving clothes will hold up just as well as they do back east. There are many types of lava in our caves. Some are smooth basalt that you can just glide over, others have the more clingy lava you are probably accustomed to. Aside from boots and gloves, caving gear wears out about the same as it does in limestone caves.

The most important item to have is good, sturdy, thick-soled boots. The floors of many caves are sand or ice, but the ones that have exposed rolled lava will make your feet sore if you are wearing thin soled shoes or boots. Since most of our caves are dry (no streams and very little mud), there is no reason to wear fancy, expensive canyoneering boots. The lava floors are rugged, and often pointed, so thick soled and sturdy boots will be greatly appreciated by your feet.

You will also want good gloves, and a back-up pair or two. Your hands will get roughed up or cut in some places if you try to crawl barehanded.

Most of the caves used in the seminar will be large, with very little crawling. But where you *do* crawl, you will want thick, sturdy knee pads and elbow pads. You want these anyway when doing any kind of litter handling, but it goes double for lava caves. We will have vendors at the seminar to sell coveralls and cave gear!

Bigfoot is rumored to live in the area, and there has been no shortage of Bigfoot hunters passing through here. With any luck, maybe you will get a sighting of him. (I'd say plan on it!) After all, Bigfoot has been a caver longer than any of us!

Cliff Sites

We are blessed to have the iconic Smith Rock State Park right in our back yard. This is a beautiful and majestic area of towers, canyons, and crevices that is home to some of the best rock climbing in the West. Every level of the seminar will get at least one day

of training at this site. This is also a great place to play before or after the seminar, whether you are looking for rock climbing, scrambling, or just great hiking.

Central Oregon is in the rain shadow of the Cascade Mountains. Most of the precipitation is leached out of the air by the mountains. The result is mostly beautiful, sunny weather. This is not Portland. Most folks here do not own umbrellas or rain gear. So have *epic sunscreen* for the cliff days or surface activities. *Sun visors* for your helmets are a great idea. *Sunglasses* too!

Side Cave Trips

As always, there will be side trips to area caves before and after the seminar. Some options include Malheur Cave, a flooded lava tube you can paddle or swim, with some vertical options in the ceiling, where you paddle up to a rope and start and end in your boat. Dynamited Cave, just over the line into Washington, has multiple levels, climbs, and traverses that can keep you busy for a couple of days. And weather / conditions permitting, a long day trip to the Sandy Glacier Caves on Mt Hood may be made available to a small but hardy, snow-savvy group.

Venture Out On Your Own

Arrive early and leave late, so you can enjoy the outdoor recreational opportunities... rock-climbing at Smith Rock international climbing park, mountain biking on miles of single-track, mountaineering in the volcanic Cascades Mountain Range, hiking in three nearby wilderness areas, or paddle-boarding on the Deschutes and rafting on wild and scenic rivers.

There are also milder and wilder things to do in the area, such as golfing and visiting the many award-winning micro-breweries and distilleries. Locals take their beer very seriously. Walk the Bend Ale Trail, and don't miss the Deschutes Brewery tasting room and tour. www.visitbend.com/Bend_Oregon_Activities_Recreation/Restaurants_Food/Brewpubs-Microbreweries



Brent McGregor

Ascending the entrance pit at Little Big Cave



Caver Descending Doline in Dachstein Plateau, Austria-by Thomas Exel



Guntherhohle, Austria by Thomas Exel



Honorable
Mention
Awardees,
2016 NSS
Photo Salon



River Trunk by Ryan Maurer

OBITUARIES



Ray Cole, Jr.

NSS 12460 FE

Ray Cole was born on January 18th, 1946, in Memphis, Tennessee, to Ray and Jeanette Cole. His family later moved to Huntington, West Virginia, and Ray became the founder and president of the Huntington High School Amateur Radio Club. He graduated from high school in 1964, and then attended West Virginia University, attaining both undergraduate and graduate degrees in Electrical Engineering. Ray, while at WVU, was a member of the Tau Beta Pi, the Engineering Honor Society, and of Eta Kappa Nu, the International Electrical and Computer Engineering Honor Society.

Ray had always loved the outdoors, and he became a valued member of the WVU Outings Club. Ray often led backpacking, snowshoeing, and caving trips, and his participation in this club would provide Ray with a lifetime of friends and uncountable opportunities for more outdoor adventures.

Ray moved to northern Virginia after his graduation and took a job with the Naval Research Laboratory (NRL) in Washington, D.C. He married fellow WVU grad, Susan Sledge on June 22nd, 1974, and the couple became the parents of three children: Michael, Kimberly, and Jason.

Ray continued backpacking, hiking, and caving for the next four decades. He, together with Bruce Boss, became the co-chairmen of the Organ Cave Project, an effort to map what was then the second-longest cave in the United States. Ray led countless survey trips, and he spear-headed efforts to locate stations above the cave,

using radio equipment he designed and built.

Ray, together with Paul Stevens (who was by then the project co-chairman), used Bob Thrun's modern survey program to go through the project's entire data set and locate the many errors. This project ended with Paul Stevens' 200-page publication, which included appendices written by Ray on survey methods, survey accuracy, and a description of the radio equipment utilized.

It was also during this time that Ray helped form the Appalachian Search and Rescue Conference, a group that originally consisted of cavers and which has grown over the past 40 years into seven different rescue groups that operate in the states of Ohio, West Virginia, Virginia, Pennsylvania, and Maryland. Leveraging tactics and technologies derived from the cave-rescue community, the Conference grew into one of the most effective and respected ground SAR organizations in the Mid-Atlantic Region, and have assisted in the rescue of over 100 people to date. Ray was the first treasurer with the Conference, and he later worked with both the Cave Rescue Coordination Network and the Eastern Region of the National Cave Rescue Commission.

Ray worked at the NRL for 43 years, never really retiring, and made significant contributions to many vital national programs and scientific projects (in other words, doing some kind of work that he couldn't tell anyone about). Ray also provided communication support to Prince Albert II of Monaco's expedition to the North Pole. He was a life member of the American Radio Relay League, with the call sign K4GAA (SK), and achieved the Amateur Extra Class (the highest possible). He was a member of the Communications and Electronic Section of the NSS, and used his expertise to create and employ some of the most advanced cave radio technology for reliable and effective through-the-earth communications.

Ray was a leader for Boy Scout Troop 680, of Alexandria, Virginia. He was member of the Potomac Appalachian Trail Club, the D.C. Grotto, Fairfax Underground Network, West Virginia Association for Cave Studies, and the West Virginia Cave Conservancy. He was also a Fellow of the National Speleological Society.

Ray was a long-time judge of the NSS' Slide Salon, a job that evolved into Ray becoming co-chair of all the Salons, a position he held with Cady Soukup for several decades. While Cady handled the up-front part of this job, Ray was happy to work behind the scenes, using his expertise to keep things running smoothly.

And this, in a very real way, exemplified Ray Cole. He was quiet, generous, and willing to work behind the scenes. He always spoke in a calm voice, and nothing ever seemed to rattle him. His employees with the NRL told of being unknowns going to meetings with naval big whigs, but receiving immediate respect when they were introduced as being a part of Ray Cole's team.

I (George Dasher) was fortunate to meet Ray in 1975 when I joined the Organ Cave Project. His never-get-excited demeanor had a great calming effect on the young, high-energy members of the project. Later, I attended many NSS conventions with Ray, and I camped with him for about 30 years at OTR. He was quick to loan me money when I had none, he often offered motel space free of charge at the conventions, and he gave Cady and Samantha Soukup his tent at the 2007 Indiana Convention, when a bad windstorm destroyed their tent. Ray instead went and slept in the school gymnasium on a Red Cross cot. Such generosity and quiet, unassuming graciousness was common with Ray, as he was always a friend that you could count on.

I went on many "kids trips" with Ray, and it was enjoyable to watch him shepherd the always noisy pre-teens and teenagers through a cave. In addition, there was also a never-ending parade of cavers who visited our OTR campsite to talk to Ray, to seek his advice on many subjects (he was a superb photographer), and to reminisce about old caving trips.

Ray was, in short, the type of person you choose to emulate to be a better person, and to say that the NSS and the caving community has lost a friend is a terrible understatement. Ray was simply a great friend, a generous, one-of-a-kind person who will be very much missed, and whose death has created an immense hole that can never be filled.

Ray died on January 26th, 2017, from complications derived from acute leukemia. He is survived by Susan, Michael, Kim, and Jason, as well as his sister and brother, and his caving and OTR families. The last thing done, at Ray's memorial, was to play *Take Me Home, Country Roads*, and we—your family and many friends—sincerely hope you have indeed gone home to a better place.

Donations in Ray's name can be made either to the National Speleological Society, the West Virginia Cave Conservancy, or the West Virginia Association for Cave Studies

George Dasher and Gene Harrison

Researchers at the University of Minnesota have found that major flooding and large amounts of precipitation occur on 500-year cycles in central China. These findings shed light on the forecasting of future floods and improve understanding of climate change over time and the potential mechanism of strong precipitation in monsoon regions. The research is published in the *Proceedings of the U.S. National Academy of Sciences (PNAS)*. The research used stalagmites collected from **Heshang Cave** in central China and measured the magnetic properties of the stalagmites. Researchers discovered more than 8,000 years of data within the materials, in such a way as to trace out a 500-year cycle of storm variation, where wetter intervals showed an increased concentration of magnetic minerals. (Jan. 19, <http://bit.ly/2kl6oBT>)

Roboticians from the University of Illinois at Urbana-Champaign and Caltech have just built a lightweight robot inspired by bats. Since bat flight is described as the 'holy grail of aerial robotics', researchers hope to be able to build upon this design for future applications such as wildlife surveillance, search and rescue, and to monitor construction sites. Thank you, **Bat Conservation International** for providing a link to the story. (Feb. 1, <http://cnet.co/2kX5RF8>)

Dr. Barbara Winsborough, of **The Texas Cave Diatom Project**, has asked Logan McNatt by way of the Texascavers listserv, to pass on an opportunity for Texas cavers to collect data and contribute to the study. According to Dr. Winsborough, the goal of this unfunded project is to document the diatom algae living in Texas caves through the help of cavers who are willing to collect small amounts of material from the caves they visit and send them to her laboratory for analysis. Although diatoms have been reported in caves throughout the world, this is the first systematic study of diatom algae in Texas caves. As such, the Texas Cave Diatom Project, will be a fundamental contribution to the biodiversity of Texas caves. Interested Texas cavers should contact her at: *Dr. Barbara Winsborough, Principal Investigator, Winsborough Consulting, 23606 Round Mountain Circle, Leander, Texas 78641* bwinsbor@prismnet.com

Jennifer Macalady, an associate professor of geosciences at Penn State University, has been studying biovermiculations in the

Frasassi cave system in central Italy. What are biovermiculations? "The most simple phrase I can think of [to describe them] would be alien soil," said Macalady. "They're little ecosystems, all to themselves," Biovermiculations are rich in organic matter containing diverse species of bacteria, fungi, invertebrates, and protists. For the past ten years, she and her colleagues have been studying the biovermiculations' growth and regrowth as microbes apparently digest hydrogen sulfide and "breath" the oxygen from the percolating ground water. Studying the growth patterns and conditions for biovermiculations could also guide our search for life on other planets. (Feb. 14, <http://bit.ly/2lmdTqU>)

Speaking of microbial cave biota, astrobiologist Penelope Boston announced at the annual meeting of the American Association for the Advancement of Science that microbes found inside giant crystals in the **Cueva de los Cristales** in the Naica mines of Chihuahua, Mexico, may have survived there for tens of thousands of years. Boston and her colleagues have spent eight years studying microorganisms that were discovered trapped in fluid pockets inside massive crystals of calcium sulfate. Analysis suggests that the microbes may have been trapped in these fluid pockets for 10,000 to 50,000 years and may have been dormant for some or all of that time. But they "remained viable in some fashion and were able to be regrown," she said. (Feb. 18, <http://bit.ly/2lmmJfE>)

Amber Lehman, Marketing Manager for the Southeastern Cave Conservancy, Inc. announced the recent purchase of 41 acres to add to the **Vahalla Cave Preserve** in North Alabama. The purchase increases the size of the preserve to 186 acres. The newly acquired parcel was the last privately owned tract of land inside the western end of Goshen Hollow. All of that area is now owned by either the state of Alabama's Forever Wild program or SCCi. (Feb. 21, River City Grotto, <http://bit.ly/2mCDy0v>)

On the Butler Creek Cave Conservancy Facebook page, Mark Hodge provided a report on Supersweet Dig in **Helictite Cave**, stating that the dig is now about 175 feet long. Mark also reports that he and Rick Lambert dug their way into a new room in **Cedar Knob** recently. The room averaged 2 to 3 feet high and was between 12 and 15 feet long, with a number of leads. Over 20 buckets were removed to open the

passage. Unfortunately, they could not get into the new leads as they were obstructed by breakdown slabs, some of which will require technical digging. Mark reports very good air but said, "we didn't track down which lead was the biggest producer. Well, that only took 9310 buckets." (Feb. 15, Feb. 24, <http://bit.ly/2mqAEPw>)

A report by the Triangle Troglodytes states that Ken, Dave, and Tanya began a survey of **Stone's #1** in Smyth Co. They spent seven hours underground and netted 585 feet. It still goes. In the process they came across some yellow fungus arranged in tidy lines, like primitive writing or circuitry, and a bright orange flowstone formation. (Jan. 24, <http://bit.ly/2mCOW60>)

A further trip report by Ken Walsh of the Triangle Troglodytes notes that members of Walker Mountain Grotto joined Tri-Trogs Eric, Emily, Pete, and Ken for a bat count/graffiti cleanup trip in **Hancock Cave** on February 19. The cave is owned by the West Virginia Cave Conservancy and a sporting cave for cavers. An interesting tusk/rib bone was discovered in the mud but only a limited number of bats were counted. Some graffiti was removed. (Feb. 26, <http://bit.ly/2mCNK96>)

Want to see your grotto's exploits in the NSS News? Send me an e-mail at: **caverbill_64616@aol.com** with your grotto's web site, trip reports, Facebook page, blog, or a link to sign up for your listserv and I'll do my best to get your newsworthy items in the NSS News!



Dave Bunnell

Biovermiculations in the Frasassi cave system in central Italy have been the focus of an ongoing study examining their origins.

UNDERGROUND UPDATE

Ian
Reuter

Huntsville Grotto Newsletter

Huntsville Grotto

January 2017, Vol. 59, Issue 1

An effort to re-examine and chronicle the smaller, and no doubt lesser visited caves of the Stephens Gap Callahan Cave Preserve, has resulted in the survey and documentation of **Nine Foot Falls Cave (AL K281)** and **Haley's Cave (AL 4631)**, the latter of which at 79 feet is by far the bigger and more attractive of the two.

Mark Ostrander's short hike along Huntsville Mountain in search of potential leads resulted in his discovery of a small blowing hole, which, while now opened enough to enter, has sufficient exposure that it halted him from exploring further. Due to the hole's close proximity to the downhill 719-foot long **Jeff Rowe Cave**, Mark is quite certain the two connect, however, that has yet to be confirmed.

Central Indiana Grotto Newsletter

Central Indiana Grotto

December 2016, Vol. 60, Number 9

After Chris Bell and Jesse Guethlein's September discovery of a "mini TAG-like multi-drop" in Harrison County, Indiana, the duo were anxious to get back into the cave and push past the third waterfall that had halted their previous exploration. Utilizing a PVC scaling pole, a party of four cavers, including Bell and Guethlein, were able to successfully summit the third waterfall that had stumped them before. Due to the dangerous nature of the climb, the 20-foot cascades were christened "suicide falls." Once over that obstacle, cavers pushed ahead through beautiful passages filled with small potholes, rimstone dams, and an abundance of soda straws. However, it appeared the cave was going to pinch out, as the passage continued to shrink, until much to the caver's excitement, the passage bisected a towering 15 to 20-foot tall canyon. Pushing the canyon for several hundred more feet, cavers eventually turned around as passages began to turn crumbly and shrink back down again. Estimated to be at least 2500 feet long, with several leads needing to be pushed, Bell remarks that this still unnamed cave is undoubtedly one of the most beautiful and sporting caves to be discovered recently in Indiana.

Sag Rag

Shasta Area Grotto

Sept-October 2016, Vol. 35, Number 5

After several years of hunting for "historical" **Coyote Cave** in Shasta County, California, a group of cavers finally located

the entrance to the rumored cave in 2011; however, survey had yet to be conducted until just last year. Teaming up with a number of SAG cavers, Bill Broekel surveyed the quite vertical, 131-foot long cave. Perhaps the cave's most defining feature is its 31-foot entrance drop, which contributes to its overall vertical extent of 55 feet. A map of the cave is included with Broekel's article describing its discovery and exploration.

The Northeastern Caver

Northeastern Regional Organization of the NSS

March 2017, Vol. 48, Number 1

Stephen Berge's dig efforts have expanded a Berkshire County, Massachusetts marble cave known as **Whose Fault Cave** well past its prior 100-foot surveyed length, to somewhere well over the 400-foot mark. Berge notes that the cave still has many secrets to give up as numerous leads remain, giving the cave the potential to be one of the longest in the area.

Largely ignored for the past several years due to poor landowner relations, the entrance to **Slingerlands Hellhole**, a 1700-foot long cave part of the bigger **Chatter-Stone-Hole Cave System** in upstate New York, was highly clogged with storm and weathering debris. Blessed by recent and improving landowner relations, however, cavers have again been allowed access to the area and have done a tremendous job cleaning up the area and re-opening the cave for visitation. As relatively little cartography work has been conducted in the cave since the 1970s, cavers note that a number of off-the-map passages are available for exploration and survey.

The Journal of Spelean History

American Spelean History Association

July-December 2016, Vol. 55, Number 2, Issue 150

Accompanying a map of **J-4** is Dr. Paul Riggs' detailed account of the rich history of the classic Pennsylvania cave, which today is closed to cavers.



The Right Moment, by Thomas Exel—
Honorable Mention, 2016 Photo Salon

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April 2016

