



Inside Earth



The new bat gate in Junction Cave, El Malpais National Monument. From left to right: Lydia Hernandez, Scott Christenson, Jim Kennedy, Melisa Bishop, Laura Baumann, Nikki Woodward, Eric Weaver, and Kevin Lorms. Photo courtesy of Dave Decker.

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A Word from WASO

Submitted by Dale Pate

Calendar

14th Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts on Karst

October 5-9, 2015

Rochester, Minnesota

www.sinkholeconference.com

Timpanogos Cave National Monument Restoration Camp

October 15-17, 2015

American Fork, Utah

andy_armstrong@nps.gov

National Cave and Karst Management Symposium

October 19-23, 2015

Cave City, Kentucky

pat.kambesis@wku.edu

Geological Society of America Annual Meeting

November 1-4, 2015

Baltimore, Maryland

<http://www.geosociety.org/meetings/2015/>

NSS 75th Anniversary Convention

July 17-23, 2016

Ely, Nevada

<https://www.facebook.com/nss75th>

Submit entries for the Calendar to bonny_armstrong@nps.gov

To receive this newsletter and pertinent updates and announcements, join the NPS Cave and Karst listserve here:

http://nature.nps.gov/geology/caves/email_info.cfm

HIGHLIGHTS OF THE NATIONAL CAVE AND KARST PROGRAM

Junior Cave Scientist Program

This program has been very popular with distribution of booklets for the first 5 months since printing to be at 12,400 hard copies and numerous electronic downloads. Since mid-April, booklets have been sent out to 29 states, Washington, D.C., and Guam. This has included 22 park units, several workshops, 1 commercial cave, at least 3 elementary schools, 1 community college, the National Speleological Society (NSS) Convention, 3 NSS Grottos, and dozens of individuals, families, and homeschoolers. We are excited to provide these excellent booklets to all educational venues. To find out more about this program, please visit: <http://www.nature.nps.gov/geology/caves/jrcavesci.cfm>

Welcome

Melisa Bishop begins a 1-year guest scientist position working with the Cave and Karst Program at the end of October. Working through Conservation Legacy and AmeriCorps, Melisa will continue the development of cave and karst summaries for NPS park units and will also help us begin a new project to identify karst landscapes that the NPS shares with the US Forest Service. This particular project will provide both agencies with



Dale Pate, NPS National Cave and Karst Coordinator. Photo by Johanna Kovarik.

an initial review of needs, particularly concerning contributing water recharge areas and zones for springs within these shared landscapes.

Coronado and Fort Bowie Technical Assistance Request

A request for assistance from Chief of Resources Jason Mateljak prompted a site visit June 10-12 to Coronado National Memorial and Fort Bowie National Historic Site. On Thursday, June 11, 2015, I met with Jason Mateljak, Ryan Janway, Jessica Garcia, Stephanie Kangas, and Tess Wagner in the Resource Management Offices at Coronado National Memorial. After a discussion on cave and karst issues and concerns, during the course of the day we visited a smaller cave, Coronado Cave, and a couple of mine sites. The following day, June 12, we traveled to Ft. Bowie National Historic Site visiting several locations including Apache Spring, and both the older and younger Ft. Bowie sites. On Friday, June 13, we were back in the office at CORO where Christopher Bent-

ley joined us to continue discussions on issues and resources. A draft report has been forwarded to CORO.

Stan Allison Moves to BLM

After 17 years of working at Carlsbad Caverns National Park in the Cave Resources Office, Stan Allison has taken a Recreational Planner position with the Bureau of Land Management in Carlsbad, New Mexico. Stan's dedication and commitment to the long-term understanding, documentation, conservation, and protection of Lechuguilla and the numerous other caves within Carlsbad Caverns NP is to be commended. For the last three years, Stan has been the lone manager in an office that had at its peak 5 permanent cave specialists. Stan's last day on the job was September 18 and he will be missed within the ranks of the NPS. We wish Stan good luck as he moves into his new position.

Numbers of Parks with Caves and Karst

In case anyone is wondering, we now know of 154 park units with caves and/or karst. Of those, 95 have documented caves for a total of 4,779 caves and 110 park units have some degree of karst. I am using two categories of karst, significant and less significant. The definitions are somewhat arbitrary at the moment and used only to help identify parks that have significant karst landscapes within all or part of their boundaries. Looking at park units and the amounts of karst found in them has prompted me to look more closely at the definition of karst.

While some park units do have some degree of karst, various factors will decide whether the available karst is enough to do further studies on the karst or to relegate the park unit to containing karst, but not enough to warrant further studies at this time. I have also changed ice caves to glacier caves and am not keeping track of numbers of glacier caves, only whether a park has or had glacier caves.

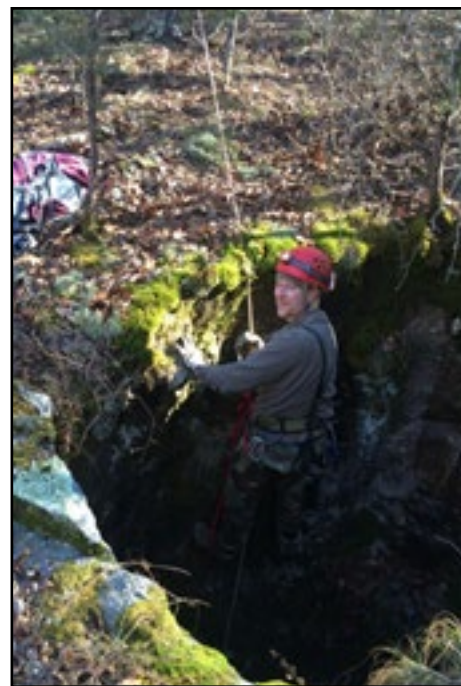
Park Updates

Buffalo National River

Submitted by Kayla Sapkota

Work in the Buffalo National River continued in full force via the working agreement between the National Park Service and the Cave Research Foundation. Research facility issues created somewhat of a stumbling block during the first of the year, but we managed to field thirty-four trips, logging 62 cave visits as of early September. Each cave visited was subjected to biological monitoring, with special attention given to documentation of bats. Twenty-six survey trips to caves with varying lengths occurred, bringing in over 4,100 feet of survey. Many of the surveys were for caves of less than 100 feet in length; larger survey projects include Fitton Cave, Toney Barnes Cave, and Sunset Cave. Trips this fall and winter will be focused on continued biological monitoring throughout

the park, completion of ongoing surveys, and survey of caves in locations most easily accessed in winter months.



Kenny Akers emerges from Waterfall Pit #2. Photo by Kayla Sapkota.



Juvenile vultures keep close watch over the crew during the survey of Toney Barnes Cave. Photo by Matt Bumgardner.

Cumberland Piedmont Network

Submitted by Kurt Helf

Filming Kentucky Cave Shrimp for CUPN monitoring video

On 18 September U.S. Fish and Wildlife Service (USFWS) and National Park Service (NPS) personnel collaborated with a professional wildlife photographer to obtain high definition still images and the first-ever video footage of the federally listed endangered Kentucky cave shrimp (*Palaemonias ganteri*) at Mammoth Cave National Park (MACA). While the event was originally scheduled for July, unseasonably heavy rains restricted access to the tributary and reduced visibility in the cave river to the extent that filming the shrimp was deferred until September. Kurt Helf (NPS-Cumberland Piedmont Network), Rickard Toomey (MACA), and Carrie Allison (USFWS- Kentucky Ecological Services Field Station) participated in the collection of five KY cave shrimp from the Hades tributary of MACA's River Styx. The shrimp were transferred from a temporary holding vessel into small aquaria where high definition, macro- still and video images were obtained by photographer Michael Durham with Mike Floyd (USFWS- Kentucky Ecological Services Field Station) overseeing and assisting. Rick Olson (MACA) documented the events with still images. After the filming concluded the shrimp were returned, unharmed, to their habitat. This event was part of a larger effort to create a video about the cave organisms

monitored by Kurt Helf and Steven Thomas (NPS-Cumberland Piedmont Network) at a subset of the parks in their network. This event would not have been possible without the participation of USFWS personnel Carrie Allison and Mike Floyd.

(editor's note: Images of the shrimp are still being processed by the photographer. Watch for them when the CUPN video goes live.)



Mike Floyd and Michael Durham (L to R) record still and video images of the cave shrimp. NPS photo by Rick Olson.



Kurt Helf emerges from Hades tributary after collecting several KY cave shrimp. NPS photo by Rick Olson.

El Malpais National Monument

Submitted by Melisa Bishop & Eric Weaver

Junction Cave

Townsend's Big-eared bats are most common throughout the western US and Mexico and typically hibernate in caves that are between 54°F and 32°F. They tend to stay in the same region year-round and maintain maternity colonies and hibernaculum within a 15 mile radius. These bats are a key-stone species for Junction Cave and are crucial for its thriving ecosystem. The populations of the Townsend's Big-eared bats consume large quantities of insects per day and are important for agriculture in that they save millions of dollars each year on reduced pesticide usage.

During hibernation season Townsend's Big-eared bats lose up to more than half of their body weight and are easily disturbed by changes in temperature, noise, and lights from visitors. By moving during hibernation, the stored energy intended to sustain them throughout the winter is used causing them to lose weight, and essentially decreases their chance of survival. These types of disturbances may result in the abandonment of the cave as a hibernaculum. Townsend's Big-eared bats have a very low reproductive rate and females typically bear only one young per year. Due to increased loss of habitat and their low reproductive rates, their population is steadily declining and are

considered endangered, threatened or of special concern in many regions.

It was discovered in 2006 that Townsend's Big-eared bats and several myotis species bats were using Junction Cave as a winter hibernaculum. In 2013 the park made the decision to implement seasonal closures to reduce disturbance from visitors during the winter months. Junction Cave is one



New species of bristletail found in the back of Junction Cave. Photo from Northup et al 1997.

of El Malpais' most frequently visited caves due to its easy accessibility, but also contains the largest known Townsend's Big-eared bat hibernaculum in the park. Junction Cave also contains an endemic species of troglobitic bristletail. These organisms are decomposers that help break down and recycle organic matter. Without hibernating Townsend's Big-eared bats to provide them with the necessary nutrients, these bristletails would not survive.

Since the seasonal closures of the cave began in 2013, the Townsend's Big-eared bat populations have increased significantly (Table 1). While this type of "soft" closure has been effective, the risk of disturbance by

Year	Townsend's Big-eared	Myotis species
2011	88	7
2012	86	1
2014	160	9
2015	226	4

Bat monitoring in Junction Cave has shown that Townsend's Big-eared bat populations have more than doubled since 2011. Although myotis species have been noted, it doesn't appear that this cave is a major hibernacula for these bats.

visitors continued to be an area of concern.

The Bat Gate

It was decided that in order to protect the hibernating Townsend's Big-eared bats, a large bat-friendly steel gate was constructed 50ft from the entrance of Junction Cave on September 21, 2015. The project was overseen by Jim Kennedy from Kennedy Above/Underground who has constructed almost 50 gates over the last 35 years. Recently he built a bat gate in the Great Smoky Mountains National Park, and won the "Wings Across Americas" award two years ago for a gate constructed at a cave located in the Mark Twain National Forest. While gating a cave is never an easy decision, Jim suggests that "Cave resources are still poorly studied, but incredibly important. It's too bad that we need to build such expensive structures to protect them. If only people would read and obey the signs, we wouldn't have to take such extreme steps."

A total of 3.5 tons of steel had to be cut and transported to the cave entrance from the El Calderon parking area by hand over the course of 2 days. As-



A) Four tons of steel was delivered to the El Calderon parking area for the construction of the bat gate. This consisted of 20ft beams weighing between 200 to 800 pounds. B) NPS Staff Melisa Bishop, Laura Baumann, and Nikki Woodward carrying a 20ft beam to the cave entrance, and Lydia Hernandez and Graham Schindel getting ready to help carry another beam into the entrance. Photos courtesy of Dave Decker.

sisting Jim Kennedy was Graham Schindel (cutter), Lydia Hernandez (welder), and Kevin Lorms from the Sandia Grotto in Albuquerque. Other volunteers from the Sandia Grotto included Dave Decker, a geology PhD student at UNM, and Scott Christenson who is a retired hydrogeologist from the USGS. NPS Staff that participated in the construction of the bat gate included Cave Specialist Eric Weaver, Biological Technician Laura Baumann, Physical Science Technician Melisa Bishop, Archaeological Technicians Wade Kaiser and Chris Baca, Chief of Resources Steve Baumann, and Student Conservation Association Intern Nikki Woodward. It is anticipated that with the installation of this new gate, hibernating colonies of Townsend's Big-eared bats will continue to grow undisturbed.

Xenolith Cave

Xenolith Cave, which is located 0.7 miles up the trail from Junction Cave, is also frequented

A) The crew lowering one of the 200 pound steel beams during the early stages of the bat gate construction. From left to right: Jim Kennedy, Dave Decker, Eric Weaver, Scott Christenson, Laura Baumann, Lydia Hernandez, and Kevin Lorms. B) Another steel beam was carried into the cave for the upper section of the gate. From left to right: Kevin Lorms, Laura Baumann, Scott Christenson, Jim Kennedy, and Dave Decker. Photos courtesy of Melisa Bishop (A) and Dave Decker (B).





Completed Bat Gate. Laura Baumann, Nikki Woodward, Eric Weaver, Jim Kennedy, Graham Schindel, Lydia Hernandez, Kevin Lorms, and Melisa Bishop. Photo courtesy of Jim Kennedy.

Schindel constructed the ladder in the parking area of El Calderon and transported it to the cave where it was bolted in place. Installation of the ladder not only provides a safer environment, but also helps protect the cave from damage.

by visitors. Approximately 450 feet from the entrance exists an 8ft drop off that was previously descended and ascended using a tree log. To improve safety and

visitor experience, a cave ladder was installed on September 23, 2015 using left over steel beams from the bat gate. Jim Kennedy, Lydia Hernandez and Graham

A) A log was placed by a visitor at the 8ft drop to be used for climbing. **B)** Chief of Resources Steve Baumann climbing down the cave ladder that was constructed and installed by Kennedy Above/Underground. Photos courtesy of Melisa Bishop.



Great Basin National Park

Submitted by Gretchen Baker, Gordon Bell, & Dylan Rhea-Fournier

Wild Cave Management Plan

The park is working on completing a wild cave management plan for the 40+ wild caves in the park. Work so far has included reviewing past data on caves, developing a spreadsheet of all known information for each of the caves, consulting with a local tribe, and filling in data gaps by visiting selected caves. Another important component has been updating the location information for the caves, as some had mysterious UTM's with no datums associated, making finding some of them a challenge.

White-nose Syndrome Monitoring

Internal cave surveys for bats were conducted at 18 caves, with nearly 100 person hours finding 6 bats. External bat surveys were conducted at four caves, along with several foraging sites. A total of eight bat species were captured in mist nets and harp nets. Many of these bats had pit tags implanted and some were fitted with radio transmitters to learn more about what habitats they were using. Acoustical surveys found a minimum of ten species, with data processing ongoing.

In addition, the weeklong Nevada BatBlitz was held at the park, bringing bat experts from the Nevada Department of Wildlife (NDOW), Lake Mead National

Recreation Area, Death Valley National Park, BLM, and Nevada Natural Heritage Program. The park was a partner for capturing bats at Rose Guano Cave, just outside park boundaries. This cave is an important migratory stop for Mexican free-tailed bats, with over one million of them using the cave each year. NDOW banded 5,000 bats over the summer for a project to help delineate the bats' migration corridor and summer and winter roosting locations.

Paleontology

Paleontological assessments were conducted in Lehman, Lehman Annex, Root, Fox Skull, Snake Creek, Little Pink (a newly discovered small cave), 3 Hole, Broken, Cave 24, Snow Cone, Castle Butte, and Cat's Meow Caves, as well as the newly-found Big Midden Shelter (we were hoping it would be a cave, but it was rather short). A large packrat midden in this shelter produced a female big-

horn sheep horn sheath that was radiocarbon dated at 10,170-9900 years B.P. The most common bones and teeth found in other caves include those from packrats, marmots, rabbits, and gophers.

Additional work has been done on the samples collected in Snake Creek Cave, surveyed in 2013. As specialists have had time to examine the paleontological specimens, several conclusions have been made:

- Snake Creek Cave fauna is unusually old – probably between 50,000 and 300,000 yrs old
- New locality records of extinct and locally extirpated Pleistocene mammals will be published
- Snake Creek Cave is only the third known occurrence of the extinct rabbit, *Brachylagus coloradoensis*
- Snake Creek Cave produced the first records of pika within the park



This well-gnawed bighorn sheep horn was stuck in a midden in Big Midden Shelter. It was radio-carbon dated to about 10,000 years B.P. NPS photo by Gretchen Baker.

Park paleontologist Gorden Bell retired October 3. We will miss his contributions to the cave program at the park. He will continue working on the Snake Creek Cave paleo inventory and plans to publish a paper about the findings.

Other

Upcoming projects include kicking off a Lehman Caves Management Plan, continued bat monitoring, a presentation at NCKMS in Kentucky about lint camps, working with 2016 NSS Convention staff, and protecting the caves in Great Basin National Park.

Lava Beds National Monument

Submitted by Katrina Smith & David Riggs

Welcome, David Riggs!

July marked the beginning of a long-awaited welcome for David Riggs, Lava Beds' new term Physical Science Technician. David comes to us from West Virginia/North Carolina (don't worry; he's been thoroughly doused in 409). Though this is his first time in the glorious NPS uniform, David has been caving and working with bats for many years. We're excited to have him as part of our team!

Lava Beds Releases Film Featuring Crystal Ice Cave

Thanks to a generous grant from The Fund for People in Parks, Lava Beds invited professional



David Riggs assists with CRF survey in the Cocoa Pipeline of Post Office Cave. CRF photo by Ken Walsh.

filmmaker Steve Bumgardner to capture Crystal Ice Cave and other features of Lava Beds in an eight minute film. Designed to document and share the beautiful perennial ice features of the cave, the film also introduces viewers to the many other wonders of Lava Beds. View it here: <https://youtu.be/Q1u15ryaHmw>

Cave Research Foundation Expands Cave Survey and Recon across the Monument

The Cave Research Foundation (CRF) has been very active at Lava Beds National Monument over the past several years, and the park has benefitted greatly from their efforts. There are currently eight Principal Investigators (PIs) conducting survey and research in all parts of the monument. What follows is an overview of the hundreds of hours of volunteer time these folks have given to Lava Beds

this year.

Scott House finished surveying the North Castle Flow in early April, spending a week away from his Missouri home to brave the perils of desert spring weather. House has been surveying known caves, improving inventory records, and finding new caves there since 2011. His time spent making sense of the dozens of small, interconnected surface tubes is much appreciated, as is his discovery and documentation of significant archaeological sites. Seventeen caves were surveyed during this year's visit, bringing the grand total for the North Castle Flow to 96 caves, but House won't stop there. He's moved on to the South Castle Flow, for the same adventure in a new place.

Liz Wolff, the champion of Lava Beds CRF efforts, has spent nearly every holiday weekend at

Lava Beds for many years, along with her husband Jim. Her epic undertaking of the resurvey of Cave Loop is nearly finished, and she's even agreed to try her hand at constructing the map of South Labyrinth (to which several other caves are connected) from survey notes of years past. Liz recently finished the map of Sentinel Cave, to which we owe thanks to John Tinsley for digitizing (Liz still loves to draft maps by hand - chalk it up to her career as an art teacher). Still in draft but nearly finished are Labyrinth-Lava Brook, Thunderbolt, and Garden Bridges. Last on the list is Natural Bridge, and we'll be here to cheer her through the last stretch of survey. There will certainly be celebration in order when this more than decade-long effort is completed.

John Tinsley, head of CRF operations at Lava Beds, is also

in charge of surveying the monument's largest bat hibernacula. The new map will improve long-term monitoring and document new passage beyond a tall slope of red baked paleosol. Tinsley took his young grandson, Gio, out for the trip of a lifetime on the 4th of July, squirming through breakdown and pushing passage at the back of the cave. Finding no leads beyond an opening near the ceiling, Tinsley thought the deal was done. Careful combing of historic records, however, showed that previous Lava Beds staff had gotten through a tight squeeze beyond that room. "I guess we'll be back for more" says Tinsley; maybe little Gio can return to help us find the right lead. Heather McDonald, our newest PI, started official reconnaissance of the Valentine Flow earlier this year. Often accompanied by her cohort - Matt Leissring, Beej Jorgensen, Bruce

Rogers, and Pat Helton - the excitable team is ridgewalking the area methodically, documenting interesting features and potential leads. Many caves in this flow are known to the park, but Heather wants to ensure we find everything out there. Loads of cave survey awaits this group if they choose to continue their efforts at Lava Beds.

Bill and Peri Frantz, our photo monitoring extraordinaires, have had a busy year with other duties taking them across the country and back. Their presence, among many others, was met with warm welcome at the Annual CRF-Lava Beds Meeting in July, and we look forward to their return.

Bill Devereaux continues his annual ice cave monitoring per his usual schedule since 1990. The monument is working with Bill to integrate his methods into regular operations so that Bill can retire from this critical project whenever he so chooses. See Bill's historic knowledge of ice caves featured in the Crystal Ice Cave Film, mentioned above.

Dave West, master of Balcony and Boulevard Caves, has been trying desperately to close loops between the Swiss cheese entrances of this often-forgotten area of the park. Magnetic anomalies can be a serious challenge in lava caves, but Dave is determined to make things right. His steadfast partner Karen Willmes keeps things light when the caving gets tough (it helps, too, that she fits in small places). Dave's excellent cartography will be used for long-term moni-



Scout House leads a survey at Lava Beds National Monument. CRF photo.

toring inside both of these caves, and his delightful airflow symbol will keep new seasonals smiling for years to come.



Last, but certainly not least, Ed Klausner has reached a glorious accomplishment, finishing the survey of Post Office and Silver Caves after several weeklong trips from the Midwest. He and his lovely partner Elizabeth Miller often teamed up with Dave and Karen, braving the depths of the 38°F Cocoa Pipeline for half the day, then returning to the surface to continue with Balcony and Boulevard. Being the new president of CRF isn't enough for Ed; he's agreed to return to Lava Beds to take on more caves in the Elmer's portion of the Mammoth Crater Flow. We're certainly delighted to continue working with Ed and his team.

A sincere thank you to all who have volunteered their time and talent to Lava Beds in this and years past. PIs can't do it alone – lots of other folks provide help along the way. This year, assistants included: Don Dunham, Richard Young, Paul Hauck, Mark Jones, Bill Broeckel, Anne Rissoni, Gio Tinsley, Rowan Copley, Arley Kisling, Breanna Kisling, Ethan McHenry, and Doug Viner.

Thanks again from the staff at Lava Beds; we certainly couldn't do all of this without you.

Bat Acoustic Monitoring

Lava Beds National Monument has had a strong bat roost and hibernacula monitoring pro-

gram in place for many years, and efforts are currently underway to bring acoustic monitoring to the forefront of our bat program as well.

Late this summer and into the fall, passive acoustic sites are being evaluated and selected so that we may be early participants in the nationwide NABat monitoring program next spring. Additionally, we will be periodically monitoring throughout the winter to gather baseline winter activity data so that anomalous bat activity related to white-nose syndrome (WNS) may be detected in the future. We will be using a combination of Pettersson D500X full spectrum and Wildlife Acoustics SM3Bat full spectrum / zero-cross detectors for passive monitoring, with automated species analysis using SonoBat 3.

In addition to typical passive acoustic monitoring, we recently deployed a pair of Titley Scientific Anabat RoostLoggers in-cave for longterm activity trend analysis at a known summer roost. The data is already providing surprising results showing that our migrating population of Mexican Free-Tailed Bats remain here at their LABE summer roost longer than previously suspected. These low-power devices are suitable for season-long deployments, and we look forward to analyzing trends for how these bats eventually migrate away from the area, as well as gaining insight for how they return in the spring.

A second pair of RoostLoggers

will be deployed to known or suspected hibernacula for gathering baseline winter activity trend data. Like many sites in the West, some of our most common summertime bat species in the genus *Myotis* - unfortunately also our species likely most susceptible to White-Nose Syndrome – are notoriously difficult to monitor throughout the winter. We hope that this renewed acoustics focus will help shed light on overwintering populations of these bats.

Ozark National Scenic Riverways

Submitted by Scott House

Despite an unusually wet summer, important research and monitoring work continued in OZAR caves.

An ongoing biological assessment of several stream caves is being conducted by Dr. Michael Sutton of the Cave Research Foundation (CRF). This will provide good baseline data for future evaluations and expand knowledge of rare species, particularly aquatics.

The Ozark Riverways hosted some speleobiological guests this summer. Two Japanese herpetologists, Sumio Okada and Mizuki Takahashi, were escorted through Round Spring Cave along with Missouri Department of Conservation (MDC) biologists Jeff Briggler and Shelly Colatskie. The pair

of researchers had never before seen the eyeless grotto salamander (*E. spelaea*) and this trip, led by Scott House, observed elev-

monitoring trip into Devils Well. The Well is a natural sinkhole that drops eighty feet into a lake room several hundred feet in

length. The water in the Well is as much as ninety feet deep and feeds Cave Spring, a mile away on the Current River. As far as records indicate, there had not been a regular, authorized trip into the Well since it was acquired by the NPS in the early 1970s. The purpose of the trip was to perform regular monitoring, assess the structural stability of the public viewing platform, and plan future work, including a more detailed map. This was the first time that explorers had entered the Well utilizing single-rope techniques (SRT); previous visits had utilized a winch mechanism, steel cable, and bosun's chair. The technical difficulties were overcome by six months of preparation: the CRF team, wearing wet-suits, had to rappel directly into water or inflatable boats, and all crew members had the ability to change over and ascend if circumstances dictated. All went well, despite high water levels in the well. The event was viewed



Assembled at the top of the Devils Well sinkhole are: Mike Tennant, Tony Schmitt, Jerry Vineyard, Dan Lamping, Scott House, Bob Lerch, and Joe Sikorski. Not shown are safety gurus Rick Haley and Mark Andrich. CRF photo.

en of them, perhaps a record. On another trip into Round Spring Cave, Mick Sutton led renowned cave biologist Tom Poulson and his guest, Brazilian cave fish expert Eleonor Trabajo into the cave to observe Ozark cave habitat. Round Spring Cave is particularly suitable for this type of visitation as the gravel and dirt trails extend to nearly the entire known cave, and rarely is it necessary to get off the trail to observe aquatic cave life.

The biggest news was a CRF

Assembled in Round Spring Cave are MDC state herpetologist Jeff Briggler along with Mizuki Takahashi and Sumio Okada. CRF photo by Scott House.





Two lines, one for rappelling and one for gear hauling dangle from the entrance to the lake in Devils Well. CRF photo by Dan Lamping.

by the media and the public, who were allowed to watch from the top of the sinkhole. A number of articles appeared in state newspapers and websites. One of those attending was Jerry Vineyard, retired assistant state geologist, who was the first researcher to enter the Well back in 1956. Now eighty years old, Vineyard enjoyed watching the modern techniques applied to a locale he first visited with inner tube and carbide light, saying “For an old caver like me, it doesn’t get any better.” Kudos to the chief organizers, Tony Schmitt and Dan Lamping of CRF; they received help from NPS staff who also did onsite

interpretation for the public on the day of the drop.

Also receiving much media attention was the removal of graffiti from Chalk Bluff on the Jacks Fork River, one of the park’s iconic sites; a local man pleaded guilty to the crime and was ordered to pay restitution. While not a cave or karst matter, the removal process was highly technical, and it was on scenic ease-

ment land. Several members of the same CRF team that entered Devils Well utilized their cave vertical skills for two days of rappelling and cleaning the bluff face with brushes and a vinegar solution. The cleaning made the news statewide.

Going into the winter months, NPS and CRF will be visiting caves for the purpose of WNS monitoring, expecting no good news.

Timpanogos Cave National Monument

Submitted by Cynthia Jeffs

Over the last two years, Timpanogos Cave National Monument has been doing more than ever before to survey bats, both in the Monument and in the surround-

Tony Schmitt, Dan Lamping, and Joe Sikorski remove graffiti from Chalk Bluff, high above the Jacks Fork River. NPS photo by Chris Figge.



ing canyon. In May 2015, Andy and Bonny Armstrong (Physical Scientist and Biological Science Technician) attended bat training at the Southwest Research Station in Arizona. Additionally, bat netting nights have increased from 3 to 4 per year. This summer, two Brazilian Free-tailed Bats (*Tadarida brasiliensis*) were caught in the nets, the first of their kind caught in the canyon.

There have also been large steps taken to identify bats through acoustic monitoring. Petterssen D500X units have been deployed at various times throughout the summer. Locations for monitoring were chosen based on their elevation and varying habitat/flyway potentials. Due to this passive monitoring Timpanogos Cave National Monument can now announce that there are Spotted bats (*Euderma maculatum*) in the Monument, a species that has never been caught and identified in the nets. There is also evidence that the Pallid Bat (*Antrozous pallidus*) and Red Bat (*Lasiurus blossevillii*) could be present as well. In addition to passive acoustic monitoring, the Resource Management team has been driving active transects to acoustically identify bats in various areas of the canyon.

October will bring additional insight into the various microbes that are present throughout the Timpanogos Cave System. A microbiology team from Weber State University will be going through the cave to determine what microorganisms are living in various areas. There are also some unknown substances of different colors (pink, purple,

and orange) attached to several formations in the cave which the students will be sampling. Whether these substances are introduced impacts or are native to the cave will hopefully be determined at the conclusion of this study.

The Resource Management team assisted the Utah BLM in creating a cave management plan for a wild cave in Utah. Several items were considered such as rescue plans, permanent rigging vs. non-permanent rigging, frequency of caving trips, allowable areas in the cave, and a photomonitoring plan. These aspects are coming together to allow future recreational visitation to this cave.

Physical Science Technician Nick Steele has compiled a wide variety of physical science data collected over the past 15 years into a report which will be public by the end of October.

It is a summary of all scientific data collected including weather, cave temperature/RH, water quality sampling, level loggers, data loggers, carbon dioxide monitoring, staff gauges, drip buckets, and dye trace tests. Some trends were found including a possible correlation of cave temperature rise and the average global temperature rise. The report also creates a viable launching point in choosing what data collection strategies should be pursued in the future. This report will be available upon request. Please contact andy_armstrong@nps.gov for more information.



TICA staff Bonny Armstrong assisting the BLM with cave management. NPS photo.



NPS paleontologist Gorden Bell will retire in October 2015. Gorden conducted several cave paleontological surveys while at Great Basin National Park. NPS photo by Gretchen Baker.



**National Park Service
U.S. Department of the
Interior**

**Cave and Karst Program
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Inside Earth is the newsletter for the Cave and Karst Program operated out of the Geologic Resources Division of the Natural Resource Science and Stewardship Program of the Washington Office in Lakewood, Colorado. This newsletter is published twice a year for staff, friends, and partners across America.

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