Beneath the Forest

Volume 7, Issue 2 Fall 2014

"Beneath the Forest" is a biannual newsletter published by the Forest Service of the U.S. Department of Agriculture.

Edited by Johanna L. Kovarik, Minerals and Geology Management

Inside this Issue…and much more... **Page**

Cave and Karst Calendar of Events

American Geophysical Union

December 15 - 19 2014

San Francisco, CA

http://fallmeeting.agu.org/2014/

International Congress on Groundwater in Karst

June 15 - June 28 2015

Birmingham, UK

http://www.speleogenesis.info/directory/calendar/event.php?id=243

National Cave Rescue Operations and Management Seminar (NCRC)

July 24 - August 1 2015

Park City, KY

http://caves.org/commission/ncrc/national/

National Speleological Society Convention

July 11—18 2015

Waynesville, MO

http://nss2015.caves.org/

Editor's Notes:

I am pleased to present our 13th issue of Beneath the Forest, the Forest Service cave and karst newsletter, published twice a year in the spring and in the fall. Our next issue will be the spring issue in May of 2015. Articles for the Spring 2015 issue are due on April 1st, 2015 in order for the issue to be out in May 2015. We welcome contributions from stakeholders and volunteers as well as forest employees. Please encourage resource managers, cavers, karst scientists, and other speleological enthusiasts who do work on your forest to submit articles for the next exciting issue!

Cover art: The view of the Flathead National Forest from Tears of the Turtle Cave, Bob Marshall Wilderness, Montana. See article, page 3. Image: Elliot Stahl

Contributors and Entities represented in this issue:

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Ashley National Forest

Katie McConahy
Monongahela National Forest

Cindy Sandeno
Monongahela National Forest

Elliot Stahl
Caves of Montana Project

David Taylor
Daniel Boone National Forest

Linda Tracy
Monongahela National Forest

Jason Walz
Lincoln National Forest

Ellie Was
Monongahela National Forest

Beth Cortright examines an ice formation in the Cave That Summer Forgot. Image: E. Stahl

Alpine Caves of Turtlehead Mountain

Jason Ballensky
National Speleological Society

Turtlehead Mountain is located in the heart of the Bob Marshall Wilderness within the Flathead National Forest of Montana. The area and its caves are accessed via a 21-mile hike from Meadow Creek trailhead. Cavers initially investigated Turtlehead Mountain in the 1970s, but found mostly small caves and shelters. The first significant cave was not discovered until 2005, when a day of ridge-walking brought us within sight of a new entrance. The entrance led to Virgil the Turtle's Greathouse Cave, the first of several noteworthy caves to be explored on Turtlehead Mountain.

In 2006, we mapped Virgil down to its present depth of 1,586 feet, making it the second deepest limestone cave in the United States at the time. The cave consists mostly of large borehole passage, requires only two rope drops and is relatively easy to navigate. Receded flood waters have left a thick layer of mud covering much of the cave's lower half. The mud creates a unique landscape, through which a trail has been designated to ensure its protection for future visitors. The entrance to Virgil lies in a cliff face. We theorize that the cave may have formed before glacial down-cutting in the area, which likely intersected the cave system and created the entrance used today. Cliff faces are exposed in multiple locations around Turtlehead Mountain and have yielded the majority of our cave discoveries.

Our next significant exploration was The Cave That Summer Forgot. We found its entrance near our only source of running surface water. We set up camp at this location, due to its proximity to the water, which made our exploration of the cave convenient. The cave contains a tight, meandering passage, which is unique from other nearby cave passages in that it trends uphill. It measures over 400 feet high and has not yet been explored to an end. (see map, pg. 6)

Tickle Me Turtle is a cave system dissected by glacial erosion in two places, resulting in three separate caves. The three entrances of the uppermost cave lie upon the face of a cliff and require rope to access. The middle cave is a short segment with two entrances. The lower cave has just one entrance and is the largest of the group. In 2012, the lower cave was explored to a depth of 1,027 feet deep (see map, pg. 7).

(Turtlehead continues on page 4)

(Turtlehead continued from page 3)

The cave continues, but a flowstone blockage prevents explorers from traveling deeper within. Double Date Cave is the only significant cave in the area with a pit entrance. The most complex cave in the area, Double Date has multiple loop passages, junction rooms and eight different passages that end in sumps. Some of the sumps can be bypassed, while others block the route. We have surveyed most of the obvious leads, but suspect that Double Date still holds potential.

Cave Name	Length (ft)	Depth (ft)
Tears of the Turtle Cave	6,163.8	1,629.2
Virgil the Turtle's Greathouse Cave	7,847.9	1,586.4
Tickle Me Turtle Cave Port #3	4,018.4	1,027.1
Double Date Cave	7,741.4	582.4
Cave that Summer Forgot	1,763.0	412.1

Table of caves and statistics from Turtlehead Mountain.

Tears of the Turtle Cave begins with a gaping entrance in the cliffs directly below Turtlehead Mountain. The position of the rocky entrance, situated high upon the cliff, was the first sign of the cave's significant depth potential. Tears is filled with confusing passages and dead ends, which lead us to initially believe that it terminated at a depth of 400 feet. We later returned to scout for additional passage and found a traverse, which significantly extended the cave. In 2013 we explored Tears to 1,100 feet deep, and this year's expedition focused on its continued survey. On early trips into Tears, many short pits were down-climbed. As the cave became deeper and the duration of trips inside the cave lengthened, these climbs became increasingly difficult.

Top: The entrance of Tears of the Turtle recedes into the distance as Jason Ballensky hikes back to camp. I: E. Stahl

Bottom: Shawn Thomas moves through Double Date Cave I: E. Stahl.

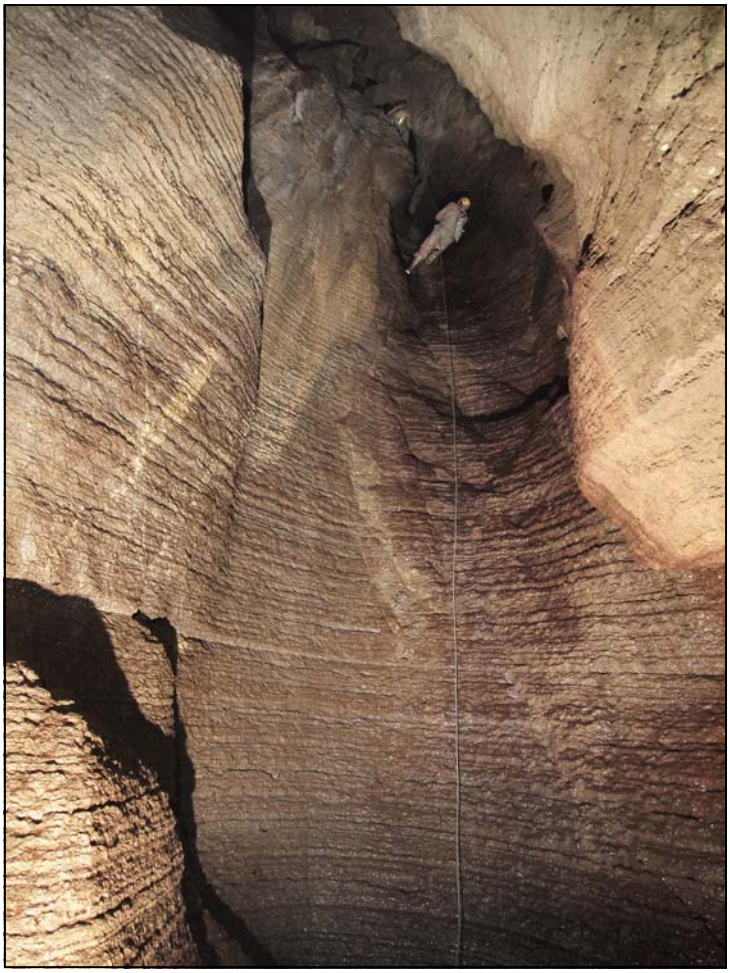
(Turtlehead continued on page 5)

(Continued from Turtlehead page 4)

Jason Ballensky squeezes through a tight sinuous passage in Tears of the Turtle. Image: E. Stahl

This year's team spent considerable time rigging the drops with ropes to increase safety and efficiency. A total of 44 rope drops are now required to reach the bottom. The 2014 expedition surveyed the cave to a depth of 1,629 feet, making it the deepest limestone cave in the U.S.

Tears of the Turtle Cave currently ends in a sizeable canyon passage. The floor is covered with a mixture of mud and water, creating a quicksand-like surface that is difficult to cross and possibly dangerous. We are currently considering various strategies to navigate the challenging passage, and hope to come up with a solution before next year's expedition. The cave still has considerable depth potential.



One of the drops in Tickle Me Turtle bells out beneath Hans Bodenhamer, on rope. Image: E. Stahl

We have mapped over six miles of passage in the Turtlehead Mountain area and discovered more than 20 caves. The area still holds great promise, but the leads are becoming more difficult to access. The remote location and strenuous nature of the caving ensure that some leads will always remain for future pursuits.

Expeditions to Turtlehead Mountain are done as part of the Caves of Montana Project, an official project of the National Speleological Society. The Caves of Montana Project has a MOU with the Spotted Bear Ranger District of the Flathead National Forest to allow for information exchange. This is an excellent way for us to share maps and information with the Forest, and we sincerely appreciate their support. We look forward to continuing our relationship with the Forest and to ongoing work in the Bob Marshall Wilderness.▪

Plan View

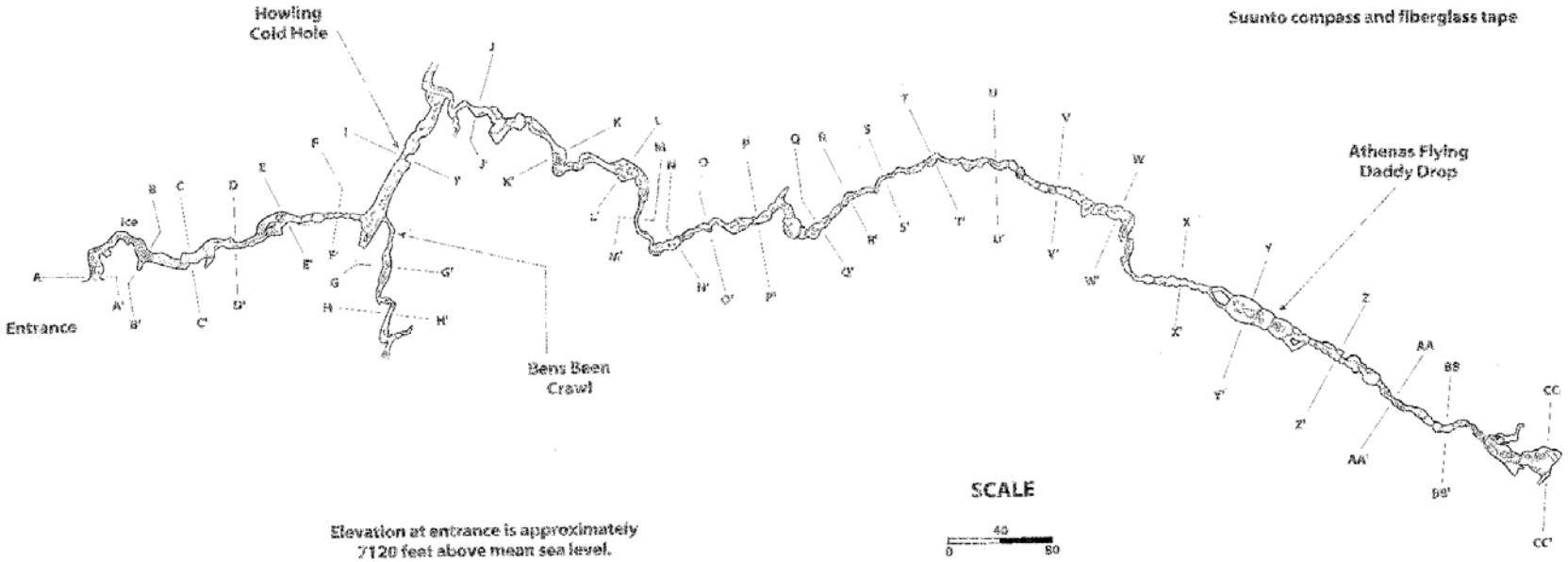
The Cave That Summer Forgot

Bob Marshal Wilderness Area
Flathead National Forest
Flathead County, Montana

Surveyed July 21, 2006 and July17, 2007

by
B. Sainsbury, S. Sainsbury, D. Powell,
T. Coleman, D. Greaser, P. Rywalder,
J. Ballensky and H. Bodenhamer

Suunto compass and fiberglass tape

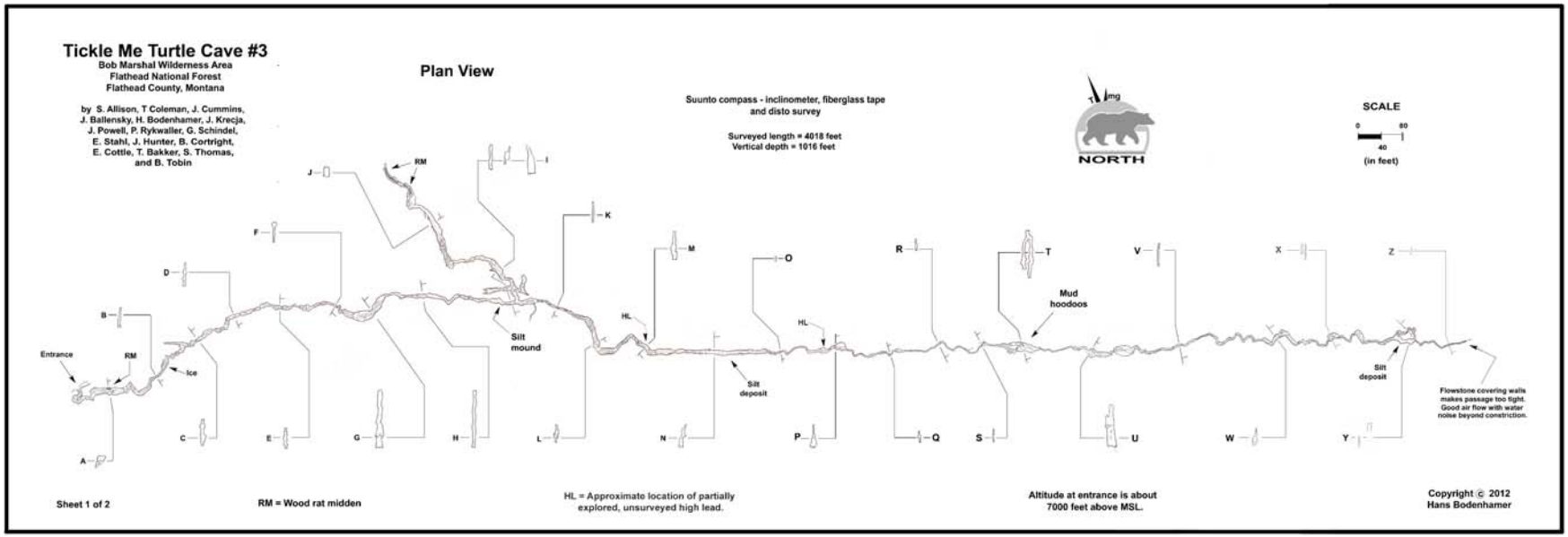


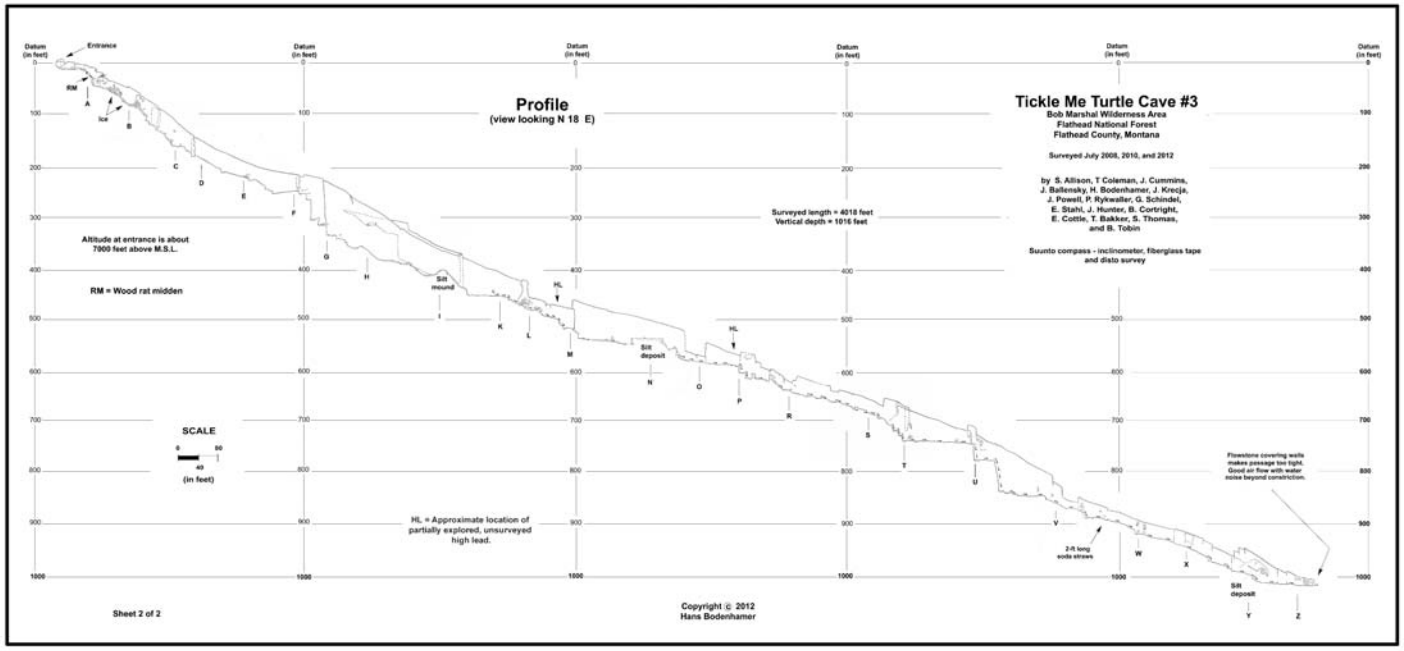
Elevation at entrance is approximately
7120 feet above mean sea level.

SCALE

0 40 80

(In feet)


Tickle Me Turtle Cave #3
Bob Marshal Wilderness Area
Flathead National Forest
Flathead County, Montana
by S. Allison, T Coleman, J. Cummins, J. Ballensky, H. Bodenhamer, J. Krecja, J. Powell, P. Rykwaller, G. Schindel, E. Stahl, J. Hunter, B. Cortright, E. Cottle, T. Bakker, S. Thomas, and B. Tobin
Plan View
Suunto compass - inclinometer, fiberglass tape and disto survey
Surveyed length = 4018 feet
Vertical depth = 1016 feet
NORTH
SCALE
0 80
40
(in feet)
Entrance
RM
Ice
Silt mound
Silt deposit
Mud hoodoos
Silt deposit
Flowstone covering walls makes passage too tight. Good air flow with water noise beyond constriction.
Sheet 1 of 2
RM = Wood rat midden
HL = Approximate location of partially explored, unsurveyed high lead.
Altitude at entrance is about 7000 feet above MSL.
Copyright © 2012 Hans Bodenhamer


Profile
(view looking N 18 E)
Entrance
RM
Ice
Altitude at entrance is about 7000 feet above M.S.L.
RM = Wood rat midden
Silt mound
Silt deposit
Silt deposit
2-ft long soda straws
Flowstone covering walls makes passage too tight. Good air flow with water noise beyond constriction.
SCALE
0 80
40
(in feet)
HL = Approximate location of partially explored, unsurveyed high lead.
Tickle Me Turtle Cave #3
Bob Marshal Wilderness Area
Flathead National Forest
Flathead County, Montana
Surveyed July 2008, 2010, and 2012
by S. Allison, T Coleman, J. Cummins, J. Ballensky, H. Bodenhamer, J. Krecja, J. Powell, P. Rykwaller, G. Schindel, E. Stahl, J. Hunter, B. Cortright, E. Cottle, T. Bakker, S. Thomas, and B. Tobin
Suunto compass - inclinometer, fiberglass tape and disto survey
Surveyed length = 4018 feet
Vertical depth = 1016 feet
Sheet 2 of 2
Copyright © 2012 Hans Bodenhamer

Ray Keeler of the Central Arizona Grotto (left) speaks to Forest Service personnel from the Coconino and Apache-Sitgreaves National Forests during a field trip to Porcupine Cave in northern Arizona. I: J. Kovarik

Cave and Karst Resource Management Field Visit and Workshop, National Forests in Arizona

Johanna L. Kovarik
Minerals and Geology Management

During the summer of 2014, the Coronado and Coconino National Forests requested a field visit from Minerals and Geology Management to discuss cave and karst management issues. The first two days were spent in the field. Monday September 22 was spent on the Coconino National Forest visiting Kaibab Caverns, Pivot Rock Cave, and various karst features within the Mogollon Rim Ranger District.

Tuesday September 23 was spent on the Apache Sitgreaves National Forest visiting Ball Sink and Porcupine Caves on the Black Mesa Ranger District. Wednesday September 24 was dedicated to discussing management issues on the Coronado National Forest. On Thursday September 25 the Prescott National Forest hosted an all-day seminar on cave and karst management. The morning session involved forest personnel from the Apache-Sitgreaves, Coconino, Coronado, Lincoln, Tonto, and Prescott National Forests relating management issues on their forests, as I and Randy Welsh, Assistant Director for Recreation, Heritage, and Volunteer Resources supplied information and answers.

In the afternoon, the group was joined by members of National Speleological Society groups in Arizona as well as representatives from Bat Conservation International and the National Park Service.

(Arizona continued on page 9)

Students are learning about collecting monitoring data at the entrance to a cave. Jim Kennedy, instructor in the yellow helmet, explains the species richness and environmental parameters found at the entrance. Image: J. Walz

Cave Fauna Inventory and Monitoring Workshop

Jason Walz
Cave Specialist, Lincoln National Forest

A new cave training program was developed on Lincoln National Forest this past summer. Jason Walz, Cave Specialist for the Lincoln and Jim Kennedy, Bat Biologist contractor teamed up to develop a training program focused on internal-cave survey. The training was a great success, incorporating Biologists from the Lincoln; as well as, from across Region 3 and the Bureau of Land Management. Participants learned the proper inventory and monitoring techniques for caves in the classroom and in the field. They used the latest monitoring equipment and developed new monitoring forms through collaboration.▪

(Arizona continued from page 8)

Main issues identified by the group included lack of inventory data on cave and karst resources, lack of available field personnel, need for established partnerships with the caving community, lack of long-term continuity within the local cave and karst program, and lack of awareness/ understanding within the forests concerning the Federal Cave Resources Protection Act. Also discussed in-depth was the cave and karst management strategy that the cavers in the area have been working to draft for each forest in Arizona, and how that strategy could be incorporated into various levels of forest land management planning. Next steps for each forest include nominating and designating caves as significant, establishing agreements with their local stakeholder groups, and looking into opportunities such as GeoCorps America Internships to hire workers to conduct cave and karst related projects. Meetings with local stakeholders and among the forests are planned in the future to develop these projects and to further work with the cave and karst management strategy.

I would like to thank Polly Haessig, Connie Lane, Frances Alvarado, and Meckenzie Helmandollar-Powell for their time and hard work in organizing the meetings and fieldtrips, and everyone who attended and contributed to the events during the week. The success of the week depends on maintaining the momentum – I look forward to hearing about the great work done in relation to cave and karst management there in the Southwestern Region over the next few years! ▪

Rare and Uncommon Plants of Rockhouses: Episode Two

David D. Taylor
Daniel Boone National Forest

**Goldenrod stem showing long, soft white hairs.
Image: D. Taylor**

In Episode One of this series (Taylor 2014), readers were introduced to rockhouses or rockshelters, recesses in cliffs composed of resistant rocks. These recesses may be small indentations in the cliff or massive overhangs in which a house could be (and in places have been) built. Some are also cave-like with dark zones. Many have complex structure within with ledges, smaller rockhouses, and crevices. A range of microclimates occurs among rockhouses and within rockhouses, but in general, temperatures and humidity inside rockhouses are more constant than outside rockshelters. This in turn provides stable habitat for many plant species.

In three counties of east central Kentucky, there occurs a goldenrod found nowhere else (endemic) and only from within sandstone rockshelters. This goldenrod (genus Solidago) is distinguished by copious, long white hairs on the stems and stems (photo, above). These hairs give the plant both its specific epithet, albopilosa (meaning white, soft long hairs) and its common name, white-haired goldenrod. The plant was described new to science in 1942 by Cincinnati botanist/ecologist E. Lucy Braun (Braun 1942). The plant's limited range, its very specific habitat, and trampling of plants by visitors to rockshelters led U.S. Fish and Wildlife Service to list the species as threatened in 1988 (USFWS 1988). All known occurrences of white-haired goldenrod occur within the proclamation boundary of the Daniel Boone National Forest.

Most of these occur on the forest, but a few are found on private land. White-haired goldenrod grows from a crown rooted with deep, sinewy roots. A single crown may have one to numerous stems (I have counted as many as 26). Stems, up to 51 cm (20 in) tall, may be erect or decumbent. In dense populations, stems become highly intertwined. Leaves are ovate or spearhead-shaped, 40-80 cm (about 1.5 – 3 in) long by 20 – 50 mm (0.75 – 2 in) wide. Both leaves and stems are covered in soft white hairs. Ten to thirty heads of yellow flowers are borne near the end of each stem. Flower heads are usually less than 10 mm (0.4 in) across.

This species generally grows on the floor of larger rockshelters and always behind the line (the drip line) where water flowing over the cliff hits the floor of the shelter. The soils in these rockshelters are sandy and usually moist to average, and relatively high in available nitrogen which leaches from the sandstone as potassium nitrate, aka saltpeter. In fact, at various times beginning with the Revolutionary War, soils in rockshelters across the Forest were mined for saltpeter. Interestingly, Francis (1998) reported that the plants grew well in the presence of available soil nitrogen. Some populations grow in very dry rockshelters and some grow in relatively wet rockshelters.

(Goldenrod continues on page 11)

(Goldenrod continued from page 10)

A closer look at the goldenrod. Image: D. Taylor

A cluster of white-haired goldenrod plants. Image: D. Taylor

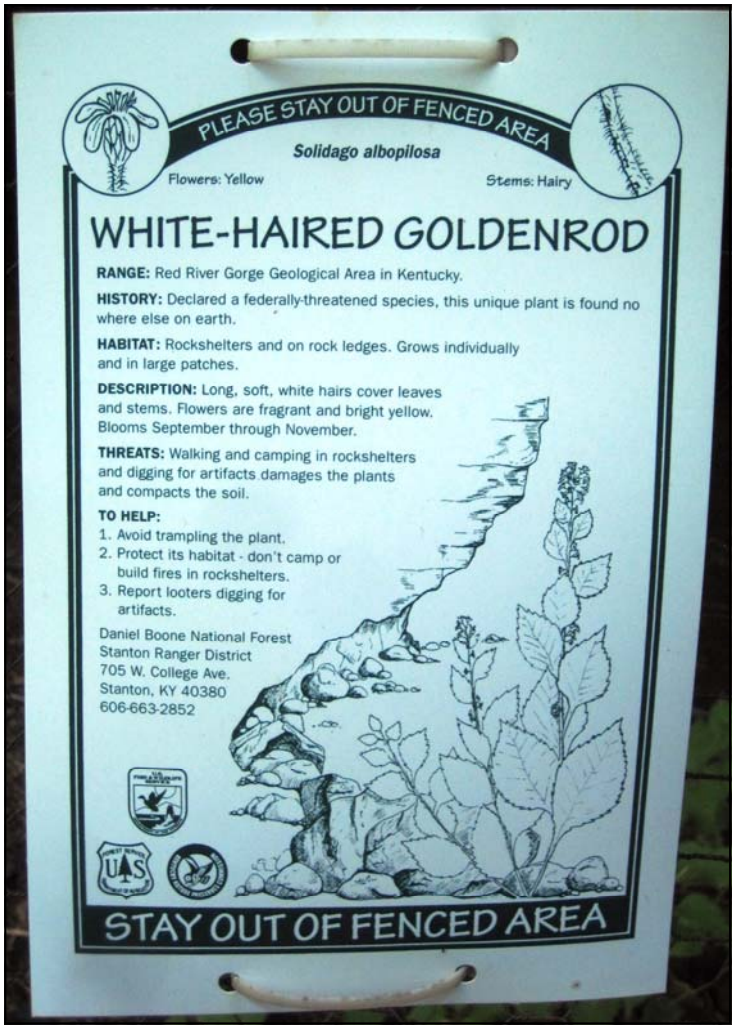
The plant also grows on ledges and in concavities of boulders within the rockshelters. Plants are usually shaded part of the day and some locations are shaded all day. White-haired goldenrod without the white hairs resembles in part Soldiago flexicaulis, zigzag goldenrod, and in part Soldiago caesia, wreath goldenrod, species which often grow on the forest side of the Andreasen and Eshbaugh (1973) conducted extensive morphological study of white-haired goldenrod and concluded that at least one population showed signs of crossing with zigzag goldenrod. Others have also suggested this . Long thought to have contributed to recent genetic history of white-haired goldenrod, Esselman and Crawford (1997) showed that in fact neither species did. Nonetheless, white-haired goldenrod may have an ancient origin in zigzag goldenrod.

People like to visit rockhouses. They are interesting places and often awe inspiring. Unintentional damage to many plants living in the rockshelters occurs as a result. In 1988, forest visitors trampling plants within rock shelters helped spur the federal listing of this plant. Today it is still a concern, but has been greatly curbed. An education effort involving the forest, Kentucky State Nature Preserves Commission (the state heritage program), and U.S. Fish and Wildlife Service has paid off. Signs posted at various area business and kiosks at trailheads alert visitors to the plant.

(Goldenrod continues on page 12)

(Goldenrod continued from page 11)

A rockshelter where goldenrods are growing. Image: D. Taylor



Signs created by the Daniel Boone to protect the white-haired goldenrod. Image: D. Taylor

Additionally, the forest has placed a number of simple chicken wire and rebar fences at the most heavily visited rockshelters. Small signs are affixed to the fence telling visitors what is behind the fence and asking them to stay out of the fenced areas. Most visitors comply and areas in which the goldenrod was trampled out of existence are being recolonized by seedlings.

Monitoring done by the forest and Kentucky State Nature Preserves Commission indicates the species is doing fairly well now and on its way to recovery. U.S. Fish and Wildlife Service is giving consideration to delisting. Continued improvement in population numbers and health could make that a reality.▪

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New Karst Division at the Geological Society of America!

Cory BlackEagle
University of Kentucky

Thanks to the efforts of a large number of people, I am very pleased to announce that on Wednesday, October 22 at the annual meeting, GSA Council approved our application and so the GSA Karst Division has been officially created. Why a Karst Division? Our justification statement, for your interest, to give you an idea of our emphases and missions:

Karst is a terrane comprised of distinctive landforms and hydrology which relies on the host rock being highly soluble in the presence of naturally-occurring acids. Karst terrane is an open system that contains geological, hydrological, biological, geochemical, and meteorological components that interact with and upon one another both at the surface of the Earth and in the subsurface. Connections between all components can be dynamic and operate on very short to very long time scales. Such terrains can be active and contemporary or inactive and/or completely decoupled from current conditions. According to the American Geosciences Institute (Veni, et al., 2001), karst terrane underlies approximately 25% of the global land surface. Ford and Williams (1989) estimated "that 25% of the global population is supplied largely or entirely by karst waters (p. 6)." It is clear that karst terrane serves as a fragile foundation for urban and rural populations. Karst terranes have been important to distinguished GSA members since the 1890s. The GSA Bulletin has long-published landmark karst research, such as Origin of Limestone Caverns in 1930 by William Morse Davis, and Vadose and Phreatic Features of Limestone Caverns by J Harlen Bretz in 1942.

The study of karst terranes necessarily involves a wide variety of subjects and specialties, spanning almost every division in GSA. These include geobiology, geomicrobiology, soils, environmental geology, engineering, geology, geochemistry, geophysics, structural geology, geomorphology, archeology, and even planetary studies.

The presence and characteristics of karst impacts a number of key scientific and infrastructure topics. Most karst studies require a multi- and inter-disciplinary approach. Because sediments and speleothems (mineral deposits) in caves are, in many respects, isolated from surficial processes on both short and long time scales, they provide valuable resources to study the Earth's conditions recorded in them. Careful study provides information on fluctuations in regional temperature, atmospheric gases, rainfall, glaciation, sea-level change, flora, and fauna.

Karst terrane, like many other areas, is valuable for the economic resources it provides. The beer brewing industry as well as the bourbon whiskey industry relies heavily on the water from karst areas. The rock that hosts karst such as limestone, dolomite, marble, gypsum, travertine, and rock salt, are quarried throughout the world. Paleokarst areas (areas containing karst that has been decoupled from the surface), contain many of the world's largest economic reserves of lead, zinc, aluminum, oil, and natural gas. Cave fauna, adapted to low energy and low- to no-light conditions, exist in highly specialized, unique, and extremely fragile ecosystems. Many cave species can exist in perhaps a single cave or a single region, and many are listed as rare or endangered nationally and worldwide. Biologists often study cave species to gain insight into ecosystem development and evolution.

(Karst division continued on page 14)

(Karst division continued from page 13)

Further, many cave microbes are extremophiles, and their study assists in understanding crucial geomicrobiological processes and the interplanetary search for life. Bats, one of the most well-known species to depend on caves, eat prodigious amounts of insects on a daily basis. Boyles et al. (2011) estimate the value of bats to the agricultural industry in continental U.S. alone to be roughly $22.9 billion/year. Cave environments preserve and protect archeological material that otherwise would have been destroyed by surface processes. As a result, many of the most important archeological sites in the world are found in caves.

Due to the cavernous nature of many karst areas, infrastructure can be severely impacted by ground subsidence and catastrophic collapse. Fortunately, deaths are rare when sinkholes form, but they can be extremely costly in terms of property damage. According to Pearson (2013), "insurance claims submitted in Florida alone between 2006 and 2010 totaled $1.4 billion." Flooding is also a serious problem in karst terrain, and can also be extremely damaging and costly. Consequently, the ability to document the presence of karst terrane and properly design structures accordingly is crucial.

Water is the most commonly utilized resource in karst areas, which contain some of the largest volumes wells and springs in the world. Very large volumes of water are stored as groundwater in karst terrane; however, utilizing water from karst terrane is not without severe risk. Movement of water from the Earth's surface into a karst aquifer is rapid and without any filtration. Whatever is on the ground will flow unmitigated into karst aquifers, making them highly susceptible to pollution.

It is critical to note that previously no single division within GSA encompassed the interdisciplinary and multifaceted subject of karst. This widespread, fragile, and troublesome landscape absolutely requires a multidisciplinary forum where all aspects of karst studies can converge and share research and results. There is no single organization dedicated to the scientific study of karst in the United States. Various organizations, such as the National Speleological Society, include karst science and publish a quarterly journal for such work, but its main public persona is devoted to the exploration and conservation of caves. GSA, with its multidisciplinary geosciences scope and large, international membership, is uniquely positioned to not only fill this professional scientific gap, but to also bring a prominence to karst science as well as to provide a scientific focal point for karst researchers.

This step by GSA Council ensures that GSA will continue to fulfill its vision statement: "To be the premier geological society supporting the global community in scientific discovery, communication, and application of geoscience knowledge." You can find the latest news, including details on joining that will be posted soon at http://www.geosociety.org/divisions. ▪

The entrance to Alpha Door Cave on the Monongahela National Forest. I: provided by W. Wilson

Returning to the Caves of the Monongahela National Forest: Alpha Door Cave

Katie McConahy, Linda Tracy, Cindy Sandeno, and Ellie Was
Monongahela National forest

This summer brought a return to the caves and karst of the Monongahela National Forest. Two GeoCorps interns, Ellie Was and Katie McConahy with the Geological Society of America, came on board to assist with our Cave Resource Management Program and with our forest-wide cave management strategy that was initiated in March 2013. Initial review of over 300 recognized caves on the forest revealed little was known about all but a dozen caves.

History

Back in September 2002, twelve caves on the forest were deemed significant under the Federal Cave Resource Protection Act of 1988 (FCRPA), of which six were closed at least seasonally to everyone including Forest Service personnel as a precaution to protect endangered bat habitats and other important resources. Little was known about the spread of White Nose Syndrome (WNS) at this time. WNS was moving quickly and it was devastating to the bat populations in the east, of which many species used the forest caves as hibernacula. In March 2013, all caves on the forest were designated significant and closed, until it could be proven otherwise. Since these closures, the caves have been (legally) entered only a handful of times when necessary, typically to conduct hibernating bat counts and to clean up the mess left behind by vandals. Hardly any new data has been recorded, especially since the onset of WNS, and most existing data dates back to the 1970s.

Inventory Form

Prior to the GeoCorps arrival, an inventory form was created to assist in collecting data in caves. It was developed with collaboration of the West Virginia Department of Natural Resources and the U.S. Fish and Wildlife Service. The Inventory was designed to be used by a wide range of people from people with minimal knowledge to those with expansive knowledge of caves. The inventory form guides the identification of key features of the cave and surrounding environment. These key features are an expansion of the criteria for significance under FCRPA, those criteria being: biota, archaeological, hydrological, recreational, geological/mineralogical, or educational. If collected, this information would help to build a larger and stronger database of cave information for the forest, so that an effective Cave Resource Management Plan could be developed.

(Alpha Door continued on page 16)

(Alpha Door continued from page 15)

Left to Right: Mark Tracy, Volunteer; Ellie Was, GeoCorps; Cindy Sandeno, Ecologist and Partnerships; Katie McConahy, GeoCorps; Linda Tracy, Volunteer and retired Forest Geologist. I: provided by W. Wilson

Alpha Door

On the morning of June 12, 2014 Linda Tracy, Mark Tracy, Cindy Sandeno, Ellie Was, and Katie McConahy set out, with the permission of the Forest Supervisor, to relocate and re-evaluate Alpha Door Cave. The cave, located on Forest Service lands in Randolph County, WV, was initially located in March 2011, but was not fully explored. After about an hour of hiking uphill through the forest and nettles, the entrance was reached. The entrance to the cave is created by three large slabs of breakdown that form a triangle, or "A" shape, hence the name "Alpha Door."

Alpha Door Cave occurs in limestone near the bottom of the Greenbrier Group (Mississippian Age); primarily in one enlarged joint trending NE/SW. The extent of the traversable passage measured about 125 feet in length. A larger room inside the entrance was intersected to the NE and SW by the 1-3 foot wide and ~8 foot high joint.

The passage contained sharp edges of water-sculpted limestone and involved crawls through the small cobbled streambed fed by rapidly falling ceiling drips, as well as, some tight squeezes.

A small stream on the surface flows toward the entrance of the cave, insurges about 40 feet above the entrance at a small waterfall and re-emerges before sinking again and just before reaching the entrance. This stream channel appears to be directly over top of the cave passage and has the same NE/SW bearing as the cave passage.

The area just inside the Alpha Door entrance was teeming with life, including banded crickets, spiders, and a snail. Unidentified, microbial/fungal, hair-like, white filaments covered in condensation were found hanging from a rock inside the main room. There was, however, no evidence of bats and the wetness of the cave makes even incidental use by bats unlikely. Although there was no evidence of bats, proper WNS decontamination protocol was followed upon exiting the cave.

By entering Alpha Cave, many data gaps were filled in, as well as, some new questions posed, such as: What are the microbial filaments? Is this cave hydrologic ally connected to other caves in the area, which produce a sizeable resurgence? Is it important that the caves are open for trips like this to continue into the future, so knowledge gaps can be filled in and an effective strategy can be implemented to protect and preserve the Forest's valuable karst resources?

With the inventory form in place and a cave entrance protocol to monitor who enters the caves in place, the Forest can also enlist the help of local organizations, educational institutions, or other agencies to assist in the collection of this enormous amount of data. ▪

Underground for Four Days!

Jason Walz
Lincoln National Forest

Have you ever wondered what it would be like to sleep overnight in a cave? What about for four days straight? This past June, a team of cave surveyors did just that to explore cave passages under Lincoln National Forest. The cave they are exploring is Fort Stanton Cave, which is over 31 miles long, with only one cave entrance. The entrance is at one end of the cave system which means explorers have to travel longer and longer distances from the entrance as the cave is explored! In addition, the cave features miles of delicate areas called the "Snowy River Formation," which requires each person to carry additional weight of gear and clothing used to keep it pristine. As each team goes further and further into unexplored areas, the endurance required is ever- increasing, making a cave-camp a good idea.

Historically, the entrance to Fort Stanton Cave was discovered before 1855, on lands adjacent to the Lincoln National Forest. For over one hundred years, the cave was visited regularly and thought to be only a few miles long. In 1946, the cave entrance came under the management of the Bureau of Land Management (BLM) and the cave was still expected to stay within their boundaries.

During the mid-1970's, a volunteer group called the Fort Stanton Cave Study Project formed and started to search for more cave passages using scientific techniques. For over 30 years members of the group searched every crack and behind every rock in the historic part of the cave, making the ultimate discovery in 2001. Cave explorers popped out of a small hole to find the "Snowy River Formation" and the continuation of the rest of the cave.

Cave-camp team ready to leave the cave on their fourth day. They are in 'clean mode' wearing alternate clothing and gear to keep Snowy River pristine. LtoR: James Hunter, Stan Allison, Jason Ballensky, Shawn Thomas.
I: provided by J. Walz

In 2012, this same volunteer group discovered that the deepest part of Fort Stanton Cave is so expansive that miles of it lay under the Lincoln National Forest. As the cave continued out of sight, teams were traveling up to 10 miles in each direction to continue the cave exploration project. As groups started to reach their physical limits, a joint decision between the Lincoln National Forest and the BLM Roswell Field Office was reached to establish a cave-camp deep in Fort Stanton Cave.

Designing a cave camp is similar in many ways to the planning that goes into camping elsewhere on National Forest lands. Every effort is made to use "Leave No Trace" principles in their strictest form. The camp team starts by covering the area with tarps and ends by sweeping and removing all debris. During the trip, explorers are very careful to avoid spills, collect trash and contain bodily wastes in special containers. When the team exits the cave, they take all this material with them and the cave camp is spotlessly prepared for the next group.

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(Underground continued from page 17)

After the design of the camp and all the specialized equipment is prepared, the day finally comes for the first team to spend four days underground. Like almost every trip into Fort Stanton Cave, it begins with the exploration team gathering at the Fort Stanton Cave Bunkhouse. The leader of the trip flies in from his home in California, greeted by a local New Mexico crew of cave explorers. Every aspect of the team mission and the gear required is checked and double-checked. As the team awakes on the morning of July 14th, they realize they would soon not see the sun nor have any contact with the surface for four days – isolated from the rest of the world.

As the four-person team heads to the cave entrance, they walk down a historic stairway where people have ventured for more than a century. They follow a complex cave-path that leads them through crawls, climb-downs and squeezes. The path is easy to follow, but represents decades of exploration and discoveries made by previous explorers. Eventually the team pops through the most important discovery and arrives at the "Snowy River Formation." A beautiful white river of snowy crystals -- like no other in the entire world. The group follows this dry crystal riverbed, tracing the footsteps of the all the previous explorers, trekking along the Snowy River that meanders deep into the cave.

Making the trip to the furthest part of Fort Stanton Cave is no easy feat. The team has to cover many more miles than the majority of physically fit cave explorers can endure. Reaching the cave camp after nine hours and ten miles is a great relief, like completing a marathon and collapsing at the finish line. For three more days this is their home, a sandy, level area of the cave with an underground spring nearby.

The team sets up camp, complete with ground tarps, a primitive kitchen, sleeping bags and a latrine area. The camp is situated at a major junction of cave passages which the team will use to reach the frontier of exploration, places no person has ever been, and just a couple hours away.

The team awakes about 5:30 am to the tune of an alarm watch. No sunrise is there to greet them. As everyone gets moving and more headlamps flicker on, the darkness shifts and artificial lighting begins the dawn of a new day. Excitement builds as the team expects to find unbelievable wonders when they head out of the cave-camp. Over the next two days the team makes major discoveries inventorying and surveying more than a mile of previously unknown cave passages. On the first day, "We went back to map this side passage and spent the rest of our day surveying it. We named the start of this passage "The Beckoning." This new discovery was an 800-foot long walking size passage with lots of gypsum. It ended in a large junction room where the passage continued along the same trend but got much bigger," said Jason Ballensky, Trip Leader. Heading to other areas of the cave on the second day, the turn-around time was reached just as "We set one last station at MA58 and retreated back the way we had come leaving an unexplored 70 foot wide and 20 foot tall passage," Ballensky added.

After four days underground, the team re-emerged, tattered, sore and full of stories of adventure. Their motivation to return was already building as they seem to have forgotten the difficulties, but reflect back to the moments of wonder they experienced first-hand. The expedition ended just as it began, back at the bunkhouse, where the team was welcomed by past explorers who now compile all the maps and data. The weary cave explorers found renewal in a meal, a shower, and by soaking up some glorious New Mexico sunshine.▪