American Caves

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In This Issue

Tumbling Creek Cave: An Ongoing Conservation and Restoration Parnership

New Section of Hidden River Cave Purchased

Thomas Hall Opens After 50 Years

Contents

Tumbling Creek Cave: An Ongoing Conservation and Restoration Partnership 8
by William R. Elliott, Stephen T. Samoray, Sara E. Gardner and Thomas Aley

Virginia's Official State Bat 18
by Debra L. Silverman

Sections

Forum 3
ACCA News 4
Below America 14

Photos:
Front: *Steve Samoray at the weir in the Big Room, Tumbling Creek Cave, Missouri. This structure is used to visually gauge stream flow. Photo by William R. Elliott, 23 May 2005*

Back:
Large formation, main chamber, Chimney Cave, New Mexico. Photo by John Charles Woods

"Below America" Graphic: *Courtesy Bob Springston.*

American Caves

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Forum

From the Director

Cave Museum Expansion Ends A Century

Dear ACCA Member:

After five years of planning, fundraising and hair pulling, construction on the next phase of the American Cave Museum has finally begun. Over the next year we will spending more than $1.5 million to renovate the historic buildings that lie adjacent to the American Cave Museum in Horse Cave.

The project is complex. It involves renovating several buildings which were constructed around the rim of the entrance to Hidden River Cave. These buildings are situated in one of the most unique settings in America. Visiting tourists often ask "why was the museum building constructed along the cliff face beside the cave entrance?"

In my column this issue, I thought I'd share a bit of the unique"cave war" era history which led to the construction of the museum building. To get to the bottom of the story, I consulted local book-store owner and historian Tom Chaney. Here's the story in Tom's own words –

"Back around the 1920s, two of Horse Cave's most prominent businessmen, Clarence Owens and cave owner Harry Thomas feuded constantly. Noone knows how the feud started. Perhaps they were jealous of each others ideas and projects ... or maybe it started over a woman. No one knows.

What is generally thought to be true is that Clarence Owens owned the property where the cave museum building now sits and built the building out of spite, knowing that Harry Thomas was interested in preserving the cave entrance.

Over the years, I have heard several stories of the feud. The most interesting relates to a time when Clarence Owens and a group of men were standing on the corner of Water and Main Streets. Harry Thomas was walking down the sidewalk and has he passed the group of men, a knife was stuck in his side.

Harry turned and as he turned Clarence Owens fled. Harry caught up with Clarence in the middle of Water Street and proceeded to beat the tar out of him so severely that Clarence allegedly was forced to spend time recuperating in a hospital in Louisville.

Clarence Owens then sued Harry Thomas for the public beating. On the day of the trial, a well dressed stranger appeared in the back of the courtroom. When it was discovered that he was a private detective hired by the Thomas'to spy on Clarence Owens, the lawsuit was abruptly dropped. According to my sources, the man would have testified that Clarence Owens was recuperating in a house of ill repute ... not a hospital."

The Clarence Owens/Harry Thomas feud stories may be apocryphal, but one aspect of the feud left behind a legacy which affected Horse Cave for the rest of the century. Sometime in the late 1930s, Clarence Owens built a sewer line from one of his downtown buildings and discharged the waste directly into the main passage of Hidden River Cave. When Harry Thomas discovered this, he filed suit against Clarence Owens for polluting the cave. Clarence countersued for trespass since he owned property over the back section of the cave. Clarence's lawsuit, along with growing pollution problems and slowing public visitation during World War II, led directly to the closing of Hidden River Cave for more than 50 years.

Today, the City of Horse Cave owns most of the cave properties which Clarence and Harry bickered over. The renovation of these buildings and planned expansion of the tours into Hidden River Cave are at long last putting to rest a divisive local feud which began nearly a century ago.

And now, as Paul Harvey says,"you know the rest of the story ...."

David G. Foster

Executive Director

ACCA News

Hart County Herald

Above: Horse Cave Mayor JoAnne Smith signed the deed to property purchased by the city from the Joe Chaney Estate for the American Cave Conservation Association (ACCA). Funds for the purchase were provided by the Kentucky Heritage Land Conservation Fund (KHLCF). City Attorney Pat Ross, right, looks on along with from left, ACCA Executive Director Dave Foster; KHLCF staff member Mary Jean Eddins, Marcia Witherspoon, representing the Joe Chaney Estate, and KHLCF attorney Barbara Pauley.

New Section of Hidden River Cave Purchased

The Horse Cave City Council, during their February 2005 meeting, approved the purchase of a tract of land lying between Highway 31W and the railroad tracks and adjacent to the current city park. American Cave Conservation Association Director, Dave Foster explained to the council that the land would be purchased by the city with a grant from the Kentucky Heritage Land Conservation Fund.

The land was purchased from the Joe Chaney Estate for $11,600. Foster explained that the cave tract lying below the property was a critical part of the ACCA's effort to acquire the historic tour sections from the entrance of Hidden River Cave to Sunset Dome, the cave's largest room.

Cave Museum Construction Begins

Five years of planning and fundraising have at long last led to the beginning of a renovation project to expand the American Cave and Karst Center into three historic buildings which surround the entrance of Hidden River Cave.

Tim Peters of Peters Construction Company of Louisville, Kentucky will be acting as construction manager for the project. The first phase of the work is primarily involving exterior work such as tuckpointing the brick walls, replacing windows and replacing the roof. The construction is expected to be completed in time for the summer 2006 season.

Funding for the project has come from numerous donations from ACCA members and several major grants

including support from the James Graham Brown Foundation, federal Community Block Grant Program, federal TEA-21 program, and federal HUD funding. Completion of the project will result in additional giftshop and lobby space, a small theatre area, additional exhibit areas, and space for a karst library on the third floor.

Thomas Hall Opens After 50 Years

A new walkway constructed at Hidden River Cave has opened an area of the cave that has not been shown to the public since 1943. The new walkway skirts the edge of the enormous"First Dome"chamber and provides a view of a large underground river canyon known as Thomas Hall, which is named for the cave's previous owners.

Dr. G. A. Thomas began giving tours of the cave around the turn of the century. In 1916, his son Dr. H.B. Thomas, installed a lighting system and improved the tours. Back in the 1920s and 1930s, tourist could walk a system of wooden stairs and bridges through the hall which eventually led to Sunset Dome, the cave's largest chamber.

The project had been planned as part of the ACCA's spring cleanup on April 30th but was postponed when a large storm dumped several inches of water into the cave and made it impossible to move materials to the walkway location. During the workday, 30 volunteers turned out to help carry several thousand pounds of plastic wood decking to the edge of the flood zone.


ACCA

Once the floodwaters receded, the project continued under the supervision of Paul Carter, a local construction contractor. The walkway was constructed of recycled plastic wood and stainless steel handrails.


ACCA

Top right and bottom left: Contractor Paul Carter constructs the steel frame for the new walkway to the edge of Hidden River Cave's Thomas Hall. Inset: Thomas Hall, Hidden River Cave, Kentucky. Photo by Mitchell, Pflanze, Carney

Hart County Herald

Students from Waynesburg College comprised the major labor force in the cleanup of a dump on the Glen Lilly Road.

Rio Spring Volunteer Cleanup

by: Jerry Matera

Hart County officials, landowners, cavers, and science students worked together on March 8, 2005 to wipe out an illegal dump on the Green River. The dumpsite was in an area near the Rio Spring that, along with the green River, feeds the Green River Water District facility at Canmer, Kentucky.

The biggest part of the labor force consisted of 20 environmental science students from Waynesburg College in Pennsylvania. Tom Smith, a biology professor at the college coordinates an annual field study trip to Mammoth Cave.

Smith's local contact, Mammoth Cave National Park ecologist Rick Olson, coordinates Don't Mess With Mammoth work projects for the class trip, each project environmentally significant to the health of the cave region and Mammoth Cave itself.

Olson said the cleanup was important to the Green River in several ways. "Green River is a drinking source for the region, and it is a good bet that residents of communities such as Horse Cave, Cave City, Park City and Brownsville would prefer high quality water.

He also noted that water quality is important to fish and shellfish that live in the river. "We have 82 species of fish and 50 species of mussels, of which six are listed as endangered, in the river. The mussels and other animals which live on the river bottom are the means for cleaning up organic pollution, as long as there is not too much," Olson pointed out.

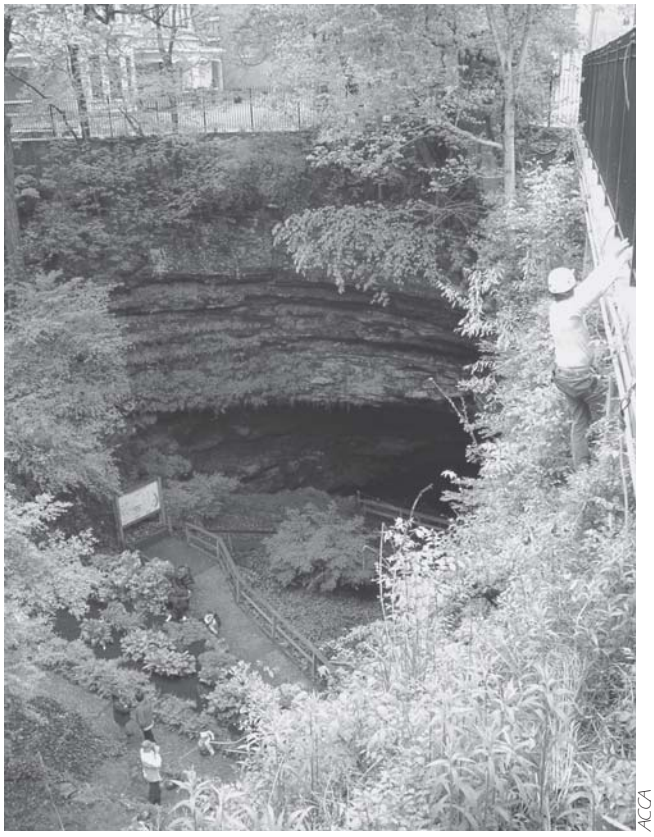
Finally, Olson commented that the quality of the river has an economic effect on the area. "Canoeing and kayaking is popular on Green River, and people need to feel safe having contact with the water."

The Hart County Road Department provided equipment and some manpower to assist in the cleanup. Members of the Hart of Kentucky Grotto, a local caving group and the American Cave Conservation Association, also assisted with the clean-up. Approximately two tons of trash, not including heavy metal objects, were removed from the site. *Reprinted with permission from the Hart County News Herald, March 17, 2005*

ACCA Spring Cleanup at Hidden River Cave

A huge storm dumped several inches of rain on Horse Cave the day before ACCA's annual spring restoration project at Hidden River Cave. The flood waters altered the day's plans but didn't dampen the enthusiasm of the volunteers one bit.

More than 30 volunteers from Kentucky and Ohio gathered at Horse Cave on April 30th with the initial goal



ACCA

A member of the Cleveland Grotto clears brush and loose rocks along the edge of the 50 foot cliff at the Hidden River Cave entrance.

of helping to build a new walkway which would open up a view of the cave's Thomas Hall. As the volunteers were arriving, the river in Hidden River Cave had risen more than 10 feet out of its bed, making it impossible to get to the construction site.

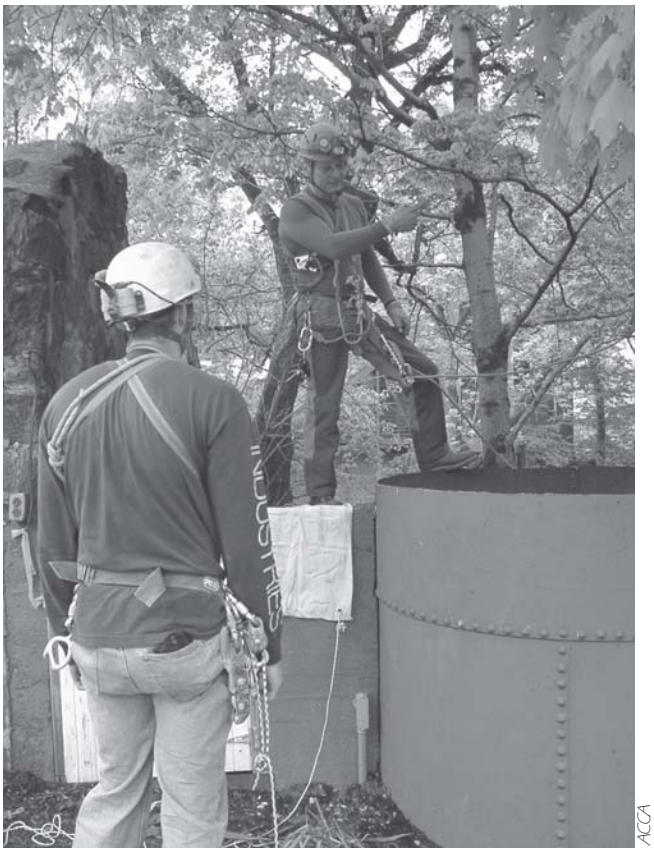
As a compromise, the group moved the materials for the new trail (mostly plastic lumber decking) as far into the cave as possible and instead focused their efforts on pruning and cleaning the cave entrance area. Several of the cavers hung ropes along the 50 foot cliff surrounding the cave and spent the afternoon trimming brush and dislodging loose rocks from these hard to reach areas.

Another group of volunteers weeded, planted and mulched a triangular garden area near the cave entrance, and trimmed ivy off a historic stairway and the old ticket office building.

"The project, cosponsored by the National Speleological Society Cleveland Grotto, lured a nice blend of volunteers," said American Cave Museum Education Specialist Peggy Nims. "We had members of the Cleveland Grotto, students from Western Kentucky University, Boy Scouts, Hart of Kentucky Grotto members and local Hart County residents."

One of the local volunteers, J.D. Trembula, shared his skills as a Lincoln Trail Master Gardner. "I have taken classes at Bernheim Arboretum and Research Forest, Elizabethtown Community College, and the Louisville Zoo," the Cub Run resident said. He plans on studying horticulture, botany or something else with plants at Berea College in the fall of 2006.

Another volunteer, Ben Garayua, is part of the Green River Watershed Watch. Garayua, an electronics technician who works with computers, assisted videographer, Benjamin Von Cramen, who was taping the project. This is one of many volunteer projects for which Garayua volunteers. "This year I hope to be involved in Habitat for Humanity," he said. "I want to lean about how houses are built."

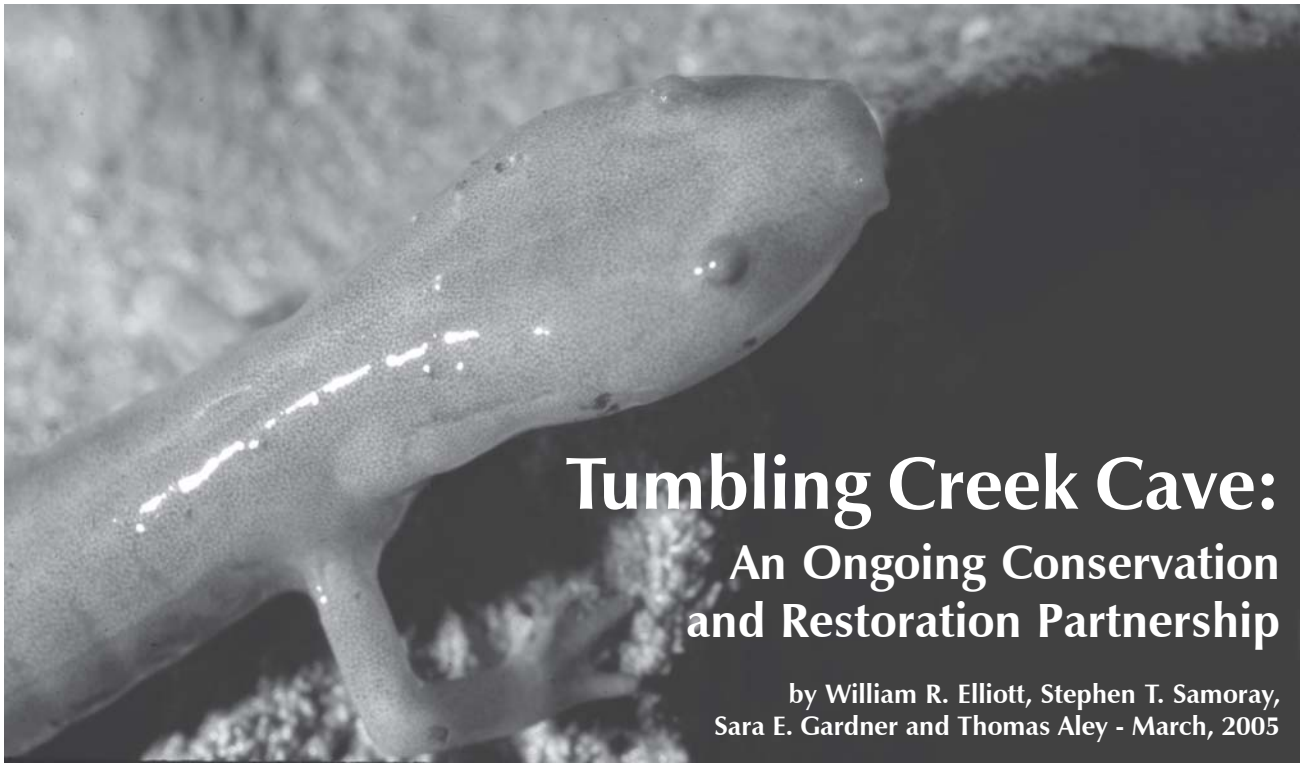

ACCA

Rebecca Bixby, a member of the Cleveland Grotto from Canton, Ohio, strapped on climbing gear and rappelled over the edge of the sinkhole to clear brush. "I love caving and this comes with it,"Bixby said. "We should give back."

ACCA sends out a special thank you to all the volunteers that helped out including: Ryan Irwin, Cory Dalton, Rebecca Bixby, Melisa Bishop, Adam Varns, Sandra Wilson, Gary McDowell, Michael Devlin, Deborah Harler, Curt Harler, Marjorie Harler, John Prisel, Deborrah Prisel, Carolyn Trent, Darla Richards, Donna Nordgren, Bill Nordgren, Steven Scott, Casimier Dec, Paul Imbrogio, Victor Fowler, George Willard, Andrew Linsenmeier, Missy Shields, Victoria Bryant, Joseph Trembula, David Trembula, Joseph D. Trembula, Jack Mueller, Debby Tyson, Katie Tyson, Cynthia Norris, and Ben Garayua.


ACCA

Top right and bottom left: Cleveland Grotto members rigged ropes and donned climbing gear to clear brush along the Hidden River Cliff face during ACCA's annual spring cleaup.



Tumbling Creek Cave:
An Ongoing Conservation and Restoration Partnership

by William R. Elliott, Stephen T. Samoray, Sara E. Gardner and Thomas Aley - March, 2005

William R. Elliott

Typhlotriton spelaeus, *Grotto salamander, Tumbling Creek Cave, Taney County, Missouri*

The famous Tumbling Creek Cave (TCC), in Taney County, Missouri, has so many interesting and valuable features that it is difficult to enumerate them all. A 2,550-acre tract in southern Missouri karst serves as the home of the Ozark Underground Laboratory (OUL), established in 1966 and operated by Tom and Cathy Aley and their staff of six. In his practice as a hydrologist, speleologist and forester, Tom travels the world to conduct water tracing studies, advise cave owners, and troubleshoot cave and karst problems. Cathy, a biologist, is involved in OUL's many studies and the daily operations of the lab. The nonprofit TCC Foundation now owns 263 acres around the natural entrance, to continue protection of the cave into the future.

TCC is an educational and research cave, one of the most amazing biological caves in the USA. A National Natural Landmark, TCC has the highest recorded biodiversity of any American cave west of the Mississippi River, rivaled only by Tooth Cave and Stovepipe Cave in Austin, Texas. Currently 111 species are listed in the Missouri Cave Life Database from TCC, including 12 species of troglobites (cave-limited creatures with reduced or absent eyes and pigment; see table 1). TCC has appeared in a National Geographic special, other TV programs, news and scientific articles. The cave harbors three endangered species: gray bats, Indiana bats and the Tumbling Creek cavesnail; the latter is nearly extinct. Scientists have been studying this cave in cooperation with the Aleys for nearly 40 years.

Antrobia culveri	Tumbling Creek cavesnail
Arrhopalites clarus	cave springtail
Brackenridgia ashleyi	trichoniscid isopod
Caecidotea antricola	Antricola cave isopod
Causeyella dendropus	Causeyella cave millipede
Chaetaspis aleyorum	Aleys' cave millipede
*Islandiana sp.**	cave spider
*Phalangodes flavescens**	harvestman
Spelobia tenebrarum	Cave dung fly
Stygobromus onondagaensis	Onondaga cave amphipod
Stygobromus ozarkensis	Ozark cave amphipod
Typhlotriton spelaeus	Grotto salamander

Table 1. About 10% of Tumbling Creek Cave's species are troglobites Species in bold are unique to this cave, while two marked with an * may be troglophiles, which are less cave-adapted.

Steve Samoray

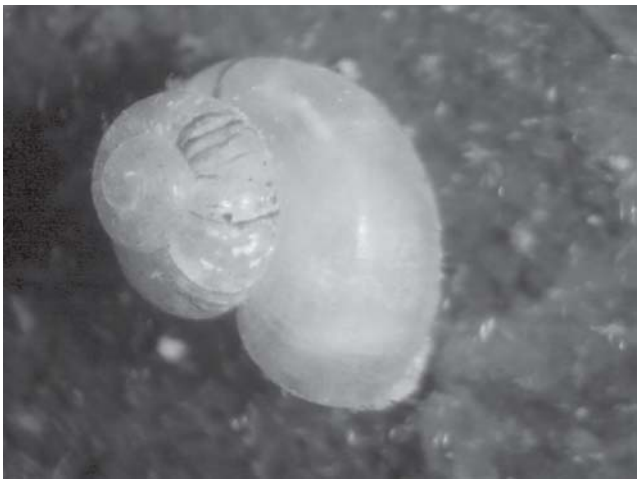
The weir in Tumbling Creek Cave gauges water flow. Detectors in the stream lead to a data logger.

TCC's biodiversity is measured not only in terms of its species richness, but in the rarity of its troglobites. Bill Elliott of the Missouri Department of Conservation (MDC) has developed a biodiversity index for Missouri caves that accounts for the number of species, number of troglobites, and how endemic or rare those troglobites are. Some are unique to TCC, such as the cavesnail, a new millipede named after the Aleys by Dr. Julian Lewis, and a new isopod named after Dr. David C. Ashley, a biology professor at Missouri Western State University (see table).

Besides its biological wonders, TCC is a gorgeous cave with a delightful, gurgling stream, called "Tumbling Creek." The Aleys lead occasional educational tours for college and professional groups. Each group gets an introduction to karst on the surface, views sinkholes, then enters the artificial shaft entrance, which has two airlock doors to keep the cave from drying out. The visitors bring their own lights and follow a rudimentary trail. The cave has been disturbed very little by this educational use.

OUL has sponsored many studies of the cave and its life. Tom and Cathy did extensive dye tracing to delineate the recharge area of the cave, and they studied groundwater infiltration rates to the cave. A state-of-the-art data logging system designed by Ralph Ewers is collecting water quality data from the cave stream. The Aleys also studied the potential long-term impacts of using bleach to control plant growth in show caves, and natural alpha radiation concentrations on behalf of the National Caves Association. Other projects have included extensive studies of TCC's cavesnail and stream fauna by David Ashley. Several biologists have estimated bat numbers. Eileen Fair from Southern Illinois University did a Ph.D. dissertation on variations in water quality and quantity in stalactite drippage. Mickey Fletcher did an enormous M.S. thesis on the micobial succession on guano piles in the cave. Barbara Martin from University of Illinois at Chicago Circle did a master's thesis on the arthropods on guano piles (and increased the size of the fauna list), and Holly Neill from Southwest Missouri State prepared a recent master's thesis on the effects of land use on Tumbling Creek Cave.

Even though TCC is appreciated and protected well, something unexpected happened in recent years. A cattle



David C. Ashley

Antrobia culveri, *Tumbling Creek cavesnail, about 2 mm diameter.*

operation was developed on a nearby farm, resulting in overgrazing and forest clearing, which loaded the groundwater with sediments. The cave has no open swallowhole upstream, but the sediments worked their way down through losing streams into the cave. Muck visibly built up in the cave stream, which is normally floored with cobbles. Some areas are so covered by sediment now that one cannot pull up rocks that used to be loose. Now the little cavesnail, Antrobia culveri, is nearly extinct. In 1972 a researcher estimated that 15,000 cavesnails lived under the stream rocks. Fewer cavesnails were noticed by 1991. Population estimates of the cavesnails by Dr. Ashley and Dr. Paul McKenzie, United States Fish and Wildlife Service (USFWS), have documented the decline since 1996.

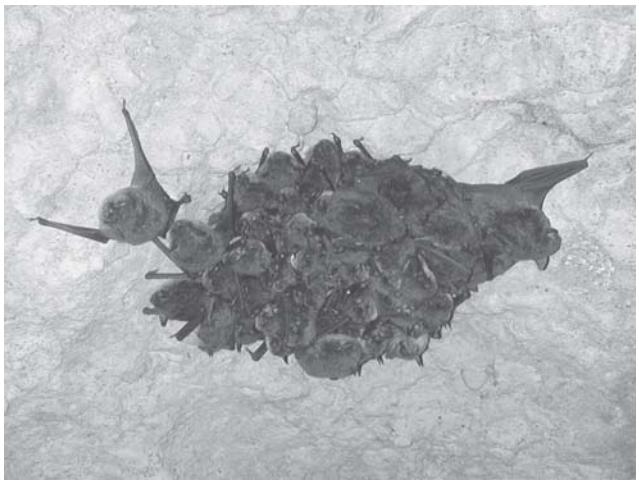
The Tumbling Creek Cavesnail Working Group was founded by Paul McKenzie to bring together experts from the region. We are studying the cave with other scientists to determine what happened. Sediments probably hurt the cavesnail and other life, but we also are checking for chemical contaminants with Semi-permeable Membrane Devices (SPMDs) and Polar Organic Chemical Interactive Samplers (POCIS) that mimic live organisms in absorbing waterborne chemicals. Dr. John Besser of the U.S. Geological Survey is analyzing sediment samples for heavy metals and organic contaminants.

Dr. Paul Johnson of the Tennessee Aquarium Research Institute is an expert in propagating aquatic snails that have declined because of environmental problems in southern streams. He is working towards breeding a suitable test or "surrogate" species of snail in his laboratory. If the methods are successful, and if enough TCC cavesnails can be found again, it may be possible to propagate them in the lab, and then put them back into a repaired Tumbling Creek someday, albeit genetic variability may be reduced.

The Aleys feel that light agriculture can be compatible with a karst system; they do some cattle raising and hay cropping on parts of their land. MDC and the USFWS are assisting the Aleys, who bought the nearby, abused property with their own funds. With cost-share funds they replanted 67,000 trees to restore the land. Tom and Cathy have overseen the planting of native species, such as black oak, northern red oak, white oak, black gum, black walnut, green ash, dogwood, redbud, sycamore and a few short-leaf pines. They expect that sassafras, hickories and persimmons will re-establish naturally from the surrounding areas. Another cost-share project with the National Park Service is helping to clear the land of trash, which was dumped or buried in several places.

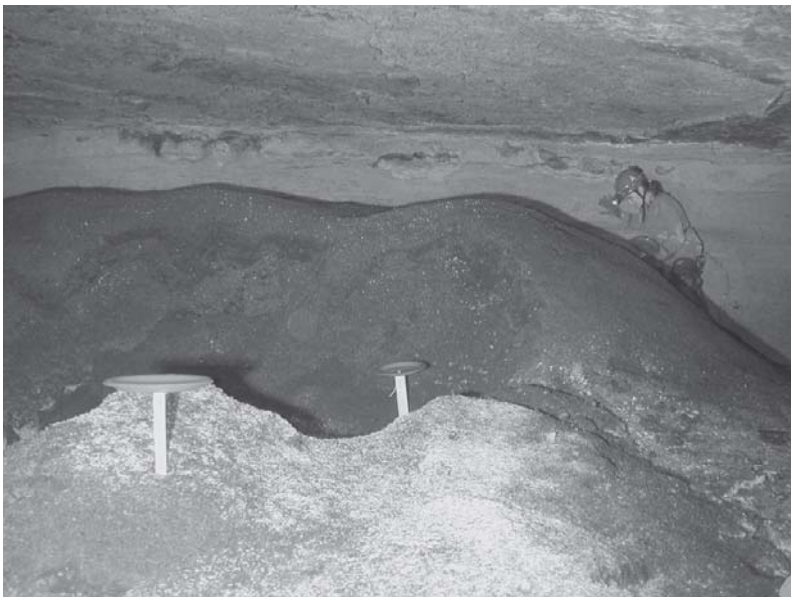
TCC provides habitat for eight species of bats. The Indiana bat *(Myotis sodalis)* has been reported in TCC on a limited number of occasions, though early anecdotal accounts indicate that the bat used the cave as a hibernation site in the past. The latest observation was in February 2005, more than 10 years since the previous report. With the new cave gate (discussed below), fewer disturbances may lead to more frequent winter use of the cave by these endangered bats.

The gray bat *(Myotis grisescens)* forms large colonies in caves, summer and winter. This makes cave protection for this species especially important. TCC's gray bats have been studied extensively because of their large numbers and the importance of the nutrient input provided by their guano (possibly 95% of the energy input to this cave is from bat guano). The earliest known population estimates in the late 1960s ranged up 150,000 bats. In 1976 there were 36,000. Over the next 20 years the numbers varied, but generally did not exceed 15,000. The last outflight count before the new gate was built was about 12,000 in 1998.



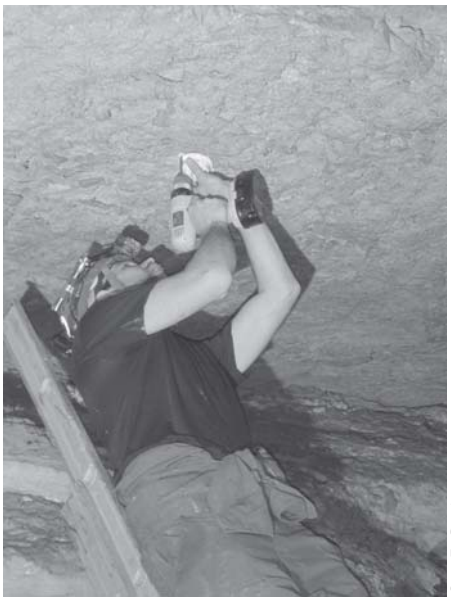
William R. Elliott

A small, late summer cluster of Gray bats, Myotis grisescens, *Missouri*



Steve Samoray

Sara Gardner checks guano in the Batmobile Room, Tumbling Creek Cave. Staked plates are for measuring guano deposition.



Sara E. Gardner

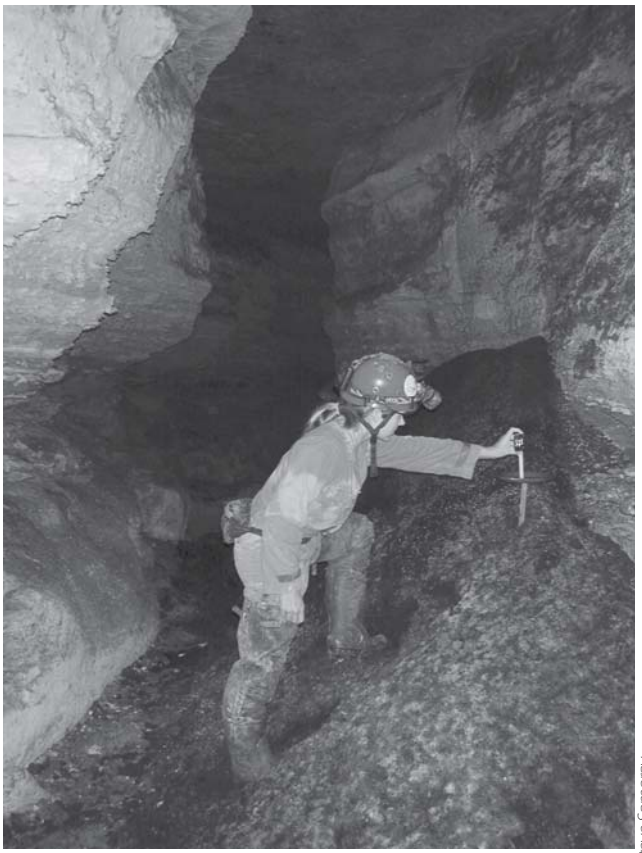
Steve Samoray installs a Hobo Pro temperature data logger in Tumbling Creek Cave.

Explaining this decline of TCC's gray bats is difficult. We think that the contributing causes of the decline might have been 1) grays declined throughout their range and locally over several decades, 2) an internal cave gate may have hindered movements of the bats, 3) disturbance by intruders via the natural entrance (not then owned and protected by the Aleys), and 4) disturbance and decline at the bat's hibernation sites some distance away.

Steve and Sara monitored the gray bats every month through October, 2004. They used internal visual surveys, guano estimates, and infrared video counts of outflights (a method first used in Missouri by Bill). This is by far the most intense monitoring effort of this population, and it consequently revealed several interesting aspects of this species' use of TCC.

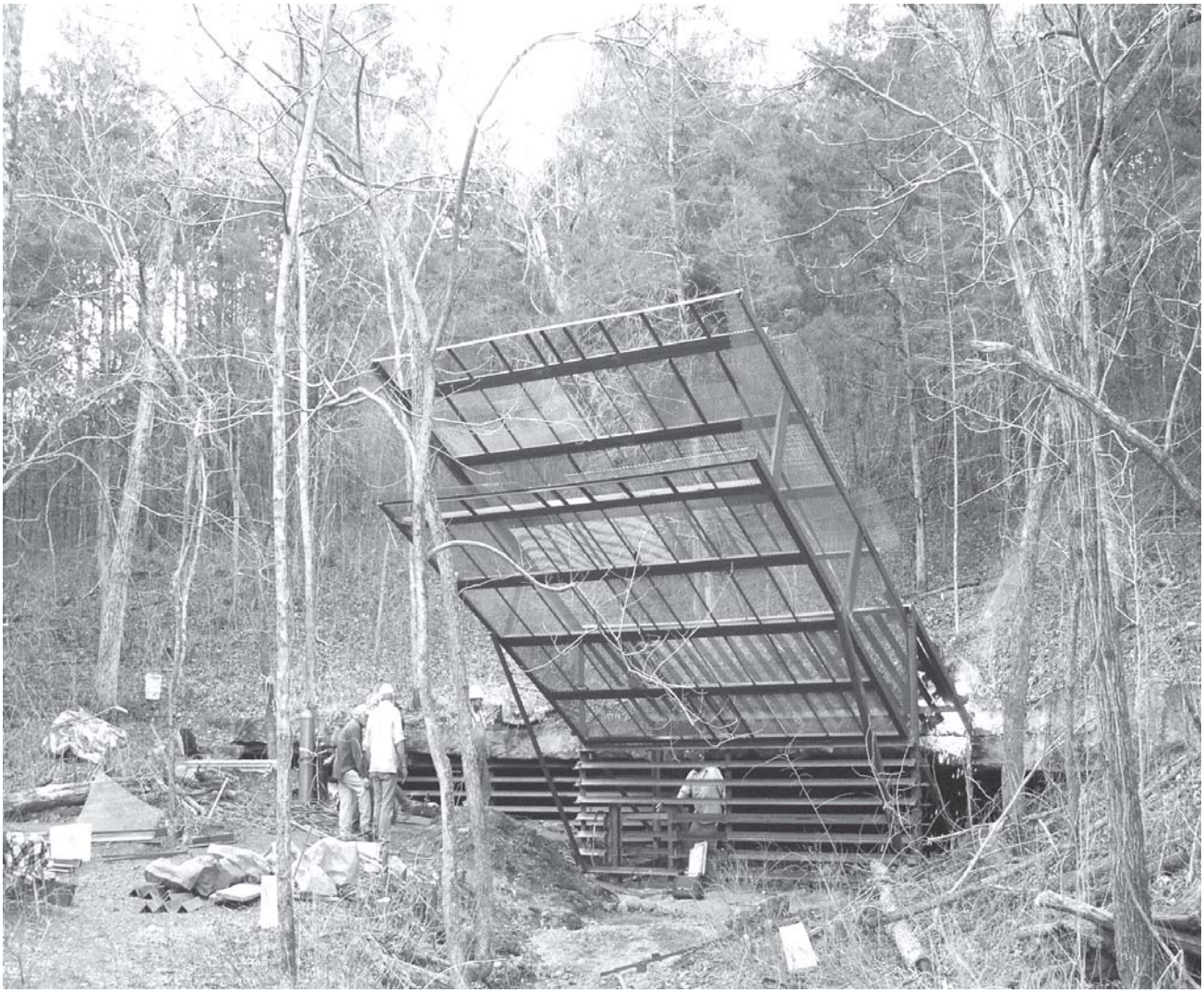
Steve and Sara found large fluctuations in the number of bats roosting in the cave throughout the summer. Outflight count numbers ranged from a low of 18,100-19,800 in May to a high of 31,700-38,300 in August. Also, the bats had more erratic emergence patterns during the first two months of the study when compared to the final few months, possibly a result of the new gate. Finally, internal surveys of the cave and the fresh guano (as measured with plates on wooden stakes, see above photo), revealed frequent movements among several roosts in the cave; a rare observation for this species, which has very strict temperature and humidity preferences.

This in-cave movement prompted Steve and Sara to start a detailed study of the internal temperature variation in TCC, using 20 temperature data loggers to define temperature profiles from 32 points in the cave. Some of the labor and equipment is provided by Dr. Steve Jones' students from Drury University. We hope to answer several questions about the temperatures in TCC and the gray bat's use of



Steve Samoray

Sara Gardner checks guano accumlated on a staked plate, Tumbling Creek Cave.



William R. Elliott

Construction of the Tumbling Creek Cave gate, March 2004. Roy Powers and Tom Aley, lower left.

this cave. These include, but are not limited to, how do water temperature changes influence the ambient cave temperature? What is the yearly temperature profile throughout the cave? How do the bats influence these temperatures? What are the gray bat's temperature preferences and how do these preferences change throughout the summer season? Ultimately this knowledge will help predict where the bats may be located at certain times of the year, allowing more cautious visitation to specific areas of the cave.

To put a piece back into the TCC puzzle, a team of 18 conservationists built the world's largest chute gate on the natural entrance in 2004. A chute gate's function is to keep intruders out of the cave to protect the bats and the other cave resources; the bats fly in and out of the chute. When we gate a cave like this, we do it not just for one species, but for an entire cave community. A chute gate is a type developed since 1996 by Roy Powers of the American Cave Conservation Association (ACCA), in Missouri and Tennessee. It allows us to construct gates on some gray bat cave entrances where we could not do so before. A chute gate is used for low, wide entrances, where there is not enough height to build the usual half gate, or flyover gate, for a maternal colony of gray bats. In most of its range, gray bat maternal colonies do not tolerate a full gate that completely covers the cave passage, even if it be properly spaced for bats. However, we can construct a rectangular metal chute, sheathed in expanded metal (mesh), that angles up from the vertical wall of the gate, high enough to be out of the reach of most intruders.

We built the chute gate in March and April, 2004 under the direction of Roy Powers and Jim Kaufmann (Caves & Karst, Inc). Staff from OUL, MDC, and a couple of volunteers constructed the 9-ton gate. The Aleys provided food and lodging, saving us a lot of travel in this remote part of the Ozarks. The cost of the gate was about $25,000, paid from an MDC "State Wildlife Grant." The price does not include in-kind services and volunteer time.

Steve Samoray

Construction of the Tumbling Creek Cave gate, March 2004.

Kenny Sherrill fabricated the strong, locking door on the gate. Jim Kaufmann returned several times to complete the welding and strengthen the gate. The gate withstood about 150 cubic feet per second of water outflow in May, 2004, a 25-year record. Meanwhile, the old internal gate was removed to expand the flyway for the bats. We observed returning gray bats using the chute gate before it was even finished, which was a good sign. Our outflight counts from infrared video indicated a large increase in the colony over the 1998 visual count, even before the full maternity season. The gate appears to be a success.

To add security, we installed a new type of electronic security system to the gate, to detect intruders and vibrations of the gate itself. This system alerts the Aleys at their house, about 1000 ft. away. We are still tweaking the design.

William R. Elliott

Closeup photo of the chute gate, Tumbling Creek Cave, March 2004.

MDC is increasing its efforts to help Missouri cave owners and provide public education about caves and karst. MDC's Private Lands Division and USFWS are working with OUL and a local school to replace a sewage lagoon that presently loses about 88% of its contents into the groundwater system that feeds TCC. In doing this, the students will get to learn about karst, groundwater and caves. Bill has assembled a new "Cave Trunk" for teachers and conservationists to use in educational projects. It contains books, curriculum guides, videos, posters, bat models and a 3D karst groundwater model that illustrates how inter-connected cave systems can be.

It is troubling that one of the most protected private caves in the Ozarks, in a rural area with little industry or row crops, still developed such ecological problems. However, the lessons we have learned and the methods we have developed will be useful to others restoring cave communities or living on karst.

UPDATE: Snail biologists Paul Johnson, Tennessee Aquarium Research Institute, and Stephanie Clark, post-doc at University of Alabama, found 67 *Antrobia culveri,* Tumbling Creek cavesnail, in three areas of the cave stream on May 23. Parts of the streambed are starting to clear of sediments that were deposited over the last decade from poor land practices on neighboring land in the recharge area. This gives us new hope that the species will recover, although propagation studies are still being planned and land restoration and tree planting continues.

Below America

The Nature Conservancy acquires land to protect a federally endangered bat and Ozark streams

BOXLEY, Ark. – In December, 2004, The Nature Conservancy purchased from Marty and Elise Roenigk of Eureka Springs, Ark., a 1,225-acre tract of land near the Buffalo National River that lies above a cave that serves as a hibernaculum for the largest colony of Indiana bats – a federally endangered species – in the state. The Roenigks sold the ecologically significant tract to the Conservancy for $400,000, far below market value.

According to Tim Snell, Ozark Karst program director for The Nature Conservancy in Arkansas, the purchase of the Smith Creek tract and an easement on adjacent property where the main entrance of Sherfield Cave is located is significant because it will immediately limit potential distractions to the Indiana bats during their winter hibernation. If disturbed during hibernation, he said, the bats are prone to expend precious energy, which can ultimately lead to their death. Snell also said the purchase will conserve the surrounding forest necessary for the bats' foraging and roosting needs, and it will help ensure the water that flows through and seeps into Sherfield Cave is protected.

"Had we not acquired this land," Snell said, "it probably would have been developed and most likely subjected to incompatible agriculture or forestry practices which would have negatively affected the cave and the bats."

According to Snell, a 1981 survey calculated there were approximately 5,000 Indiana bats at the cave. Researchers counted about 1,000 during a 2001 survey. To increase the bats' population, Snell said studies to gather more information about roosting needs will be conducted, and a forest plan designed to enhance the maternity roosting needs of the Indiana bats will be based on these findings.

"This tract is truly a special piece of property for a lot of different reasons," Snell said. "Because Smith Creek is a tributary to the Buffalo River, conservation practices at the property will also help ensure the protection of the first national river in the U.S."

When asked what prompted them to work with The Nature Conservancy, Marty said, "We've known of The Nature Conservancy for years, and we just know they are a great organization. And we know about the Conservancy's projects and programs in Arkansas, and it gave us comfort knowing an organization of this scale and strength would be managing it."

Simon said the property will most likely be available for hiking and other day-use recreational activities that do not conflict with conservation and forestry plans that are developed.

The Nature Conservancy is a private, international, non-profit organization established in 1951 to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. To date, the Conservancy and its more than one million members have been responsible for the protection of more than 14 million acres in the United States and have helped preserve 102 million acres around the world.

Since 1982, the Conservancy's Arkansas program has helped protect more than 262,000 acres of land throughout the state. For more information, contact The Nature Conservancy in Arkansas at (501) 663-6699 or visit www.nature.org/arkansas.
http://nature.org/wherewework/northamerica/states/arkansas/press/press1761.html

Alexander Cave Donated to The Nature Conservancy

Cave shelters federally endangered Gray bat nursery

Nashville, Tennessee— 27 January 2005 — A Perry County cave, which serves as a baby bat nursery, has been donated to The Nature Conservancy by a Florida businessman.

Alexander Cave, and the surrounding 210 acres, was originally part of a large timber company holding that was sold to M.C. Davis, of Santa Rosa Beach, Fla., last year.

"The Nature Conservancy has wanted to find a way to protect Alexander Cave for years and we had been communicating with the previous landowner. When Mr. Davis asked them about any special places on the property, they told him about the cave and our interest," said Heather Garland, cave and karst director for The Nature Conservancy.

When Davis learned that the cave served as a summertime nursery for Gray bat pups, he contacted Garland. Gray bats are on the federally endangered species list and up to 30,000 have been known to use the cave in the summer.

"It is rewarding to join efforts with The Nature Conservancy, the state of Tennessee and local residents for long-term protection of a bat cave. Hopefully this successful effort will

encourage others who own biologically unique places to consider placing them in long-term conservation," said Davis.

With Davis' financial support, The Nature Conservancy plans to construct a gate across the entrance of the cave to give added protection to the Gray bats. The Conservancy may also work with the Heritage Division of the Tennessee Department of Environment and Conservation to have the site designated a State Natural Area.
http://nature.org/wherewework/northamerica/states/tennessee/press/press1755.html

Development Approved Over Florida Cave

WCI Communities, Inc. (WCI) is planning to construct an upscale subdivision on 1,000 acres above a cave system off U.S. 98 in Brooksville, Florida. This could include as many as 1,700 villas or hotel rooms and single-family residences.

In January 2005 the County Commissioners voted to restrict this area to limit the development to 660 hotel rooms. This was due to fears of a possible risk of the cave collapsing. However, the county commissioners reversed their previous vote when WCI executives addressed the board and assured them that their development plans would protect the cave and would also be good for the county. By a unanimous agreement the board decided to allow WCI to proceed with its plan. The current plan is to construct 660 hotel rooms and also 1,030 single-family homes.

The cave in question is described by University of South Florida officials as "unique to Florida, the country and maybe the world." The cave has not yet been explored or mapped and its length is still unknown. WCI plans to hire Lee Florea, a University of South Florida Ph.D. candidate and also a cave expert to coordinate the exploration and study the cave as well as the land above it to ensure that it is protected from development. The unique feature of the cave is that it contains mineral formations that hang from the ceilings and walls. This is unusual for Florida caves. Although the development has been approved, WCI still has many hurdles before they can start construction. Any changes to the county's Comprehensive Plan must be approved by the Florida Department of Community Affairs. This will ensure that the county will be able to provide services for roads and utilities and that these changes would correspond with the County's development plans. The development will also be closely reviewed because it surpasses Florida's 1,000 unit threshold. WCI will be required to provide areas for park and school space as well as additional information on the development itself. All of this means more time for exploration and mapping of the cave. When this process has been completed, WCI Vice President Jim Stachkpoole has stated that he plans to give protected land that lies over the cave to the county for public use and study.
Feb.15,2005, www.hernandotoday.com

Kauai Cave Species Draft Recovery Plan Released for Public Review

A draft recovery plan outlining the recovery strategies for the Kauai cave wolf spider and Kauai cave amphipod was released for public comment on February 9th by the U.S. Fish and Wildlife Service. The two species are known to exist only in the lava tubes and cave-bearing rock in Kauai's Koloa Basin.

"This plan will lead the cooperative efforts of the Service, the State of Hawaii, and many other partners as they work to recover these two rare species," said Dave Allen, Pacific regional director for the Fish and Wildlife Service. "With the known population of the Kauai cave spider - perhaps fewer than 30 individuals - all in a single cave, we need to take action quickly to ensure that the only eyeless wolf spider in the world continues to survive."

Six broad recovery tasks are discussed in the draft plan: protecting known cave systems where the Kauai cave wolf spider and amphipod exist; protecting currently and recently occupied habitats; conducting research to gain additional knowledge of the species and their conservation needs; enhancing public knowledge of and support for protecting these species; validating recovery objectives; and developing a post-delisting monitoring plan.

The first priorities identified in the plan are to protect the cave systems where these species still exist from human-caused destruction or degradation and to improve their existing habitat. The cave amphipod is regularly found in three caves, including one where the cave wolf spider is found.

To protect the cave systems, the draft recovery plan recommends controlling human entry, preventing the destruction of native plant communities above the cave systems, developing and implementing a fire control plan for surface habitats, preventing introduction of and controlling currently present nonnative predators and competitors, preventing the introduction of bio-control organisms or bio-pesticides, and preventing contamination by pollutants such as insecticides and herbicides.

To enhance their habitats, the draft plan recommends managing the habitat above the caves to encourage the growth of appropriate plants whose roots provide food and debris for the cave amphipod, and to increase the relative humidity in caves. These cave-dwelling species (known as troglobites) appear to require high humidity, perhaps as much as 100% humidity.

These two species were first discovered in 1971 and much about their conservation needs remains unknown. Research recommended within the draft plan includes studies:
· to determine local populations sizes and/or movement;
· to determine the most beneficial plants to be used for habitat improvement;
· to develop noninvasive ways to determine the status of populations;
· to learn more about regulating the humidity of caves and its effect on these species and nonnative ones;
· to look for additional occupied caves or restorable cave systems;
· to continue monitoring activities; and
· to determine the feasibility of moving wolf spiders into unoccupied cave systems.
Public education activities are encouraged to broaden knowledge of the Kauai cave species in the Koloa and Poipu area, and to engender public support for these unique creatures. Providing technical expertise and/or funding to implement land uses friendly to these species also is encouraged.

The Kauai cave wolf spider is a mid-size (0.50 to 0.75-inch) hunting spider that has completely lost its eyes as part of its adaptation to life in lava tubes. Instead of building webs, it chases and grabs its prey or may use sit-and wait ambush tactics. Unlike most wolf spiders that produce 100 to 300 spiderlings per clutch, the Kauai cave wolf spider is believed to produce fewer than 30 spiderlings per clutch. Newly hatched spiderlings are unusually large and are carried on the back of the female for only a few days.

The Kauai cave amphipod is a small (0.25 to 0.4-inch) pale landhopper that resembles a shrimp. Like the cave wolf spider, the Kauai cave amphipod has lost its eyes. It feeds on the decaying roots of surface vegetation that reach into the cave system, as well as rotting sticks, branches, and other plant materials. This amphipod is believed to be a food source for the Kauai cave wolf spider.

The Kauai cave wolf spider and cave amphipod were listed as endangered on January 14, 2000. On June 2, 2000, the U.S. District Court ordered the Fish and Wildlife Service to designate critical habitat for these species. This was designated on April 9, 2003, in the Federal Register.

The availability of the draft recovery plan for a 60-day public comment period was announced in the Federal Register on February 9. Copies of the draft recovery plan are available through the Fish and Wildlife Service's website at http://pacificislands.fws.gov or by calling the Fish and Wildlife Service's Honolulu office at 808 792 9400. Written comments may be submitted to the Field Supervisor, Pacific Islands Fish and Wildlife Office, 300 Ala Moana Blvd., Room 3-122, Box 50088, Honolulu, HI 96850.

The U.S. Fish and Wildlife Service is the principal Federal agency responsible for conserving, protecting, and enhancing fish, wildlife and plants and their habitats for the continuing benefit of the American people. The Service manages the 95-million-acre National Wildlife Refuge System, which encompasses 545 national wildlife refuges, thousands of small wetlands and other special management areas. It also operates 69 national fish hatcheries, 63 Fish and Wildlife Management offices and 81 ecological services field stations. The agency enforces federal wildlife laws, administers the Endangered Species Act, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat such as wetlands, and helps foreign governments with their conservation efforts. It also oversees the Federal Assistance program, which distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state fish and wildlife agencies.
http://news.fws.gov/NewsReleases/showNews.cfm?newsId=F8435BBB-1143-3066-4068CFD268022CDA

Exploration Pushes Wind Cave to 5th Longest in the World

Wind Cave became the fifth-longest cave in the world after explorers mapped 2,715 feet of passages on Saturday, January 8. The official length of the cave is now 114 miles long. Members of the Colorado and Paha Sapa Grottos joined National Park Service employees in sending five teams of surveyors in to map and explore what many claim to be the most complex three-dimensional maze cave in the world.

Physical Science Specialist Rod Horrocks said,"This also makes us the third-longest cave in the country, behind Mammoth Cave in Kentucky and Jewel Cave near Custer. This achievement is the culmination of decades of efforts by numerous cavers."

Exploration efforts at Wind Cave began in the early 1880s and by 1893 it is believed 6 to 8 miles of passages had been discovered, many by teenager Alvin McDonald. Modern exploration began in the late 1950s with cavers from Colorado taking up where McDonald left off. Wind Cave was thought to be a small cave until Chicago caver, and now Hot Springs resident, John Scheltens lead four consecutive summer expeditions in the early 1970s that expanded the number of known unexplored holes in the cave from the hundreds into the thousands.

Horrocks added,"Since 1991, we have hosted monthly exploration trips by members of local caving clubs. With numerous caves in Colorado closed due to snow this time of year, many of our explorers drive up from the Denver area for a weekend of caving. Over the years, these cavers have helped the park inventory

features, correct surveying errors, and collect data such as water samples."

To learn more about exploration at Wind Cave, visit the park's website at www.nps.gov/wica/Home.htm. Ranger lead tours of Wind Cave are offered year-around. Currently, tours are offered in the Garden of Eden area of the cave at 10 a.m., 1 p.m. and 3 p.m.
http://www.nps.gov/wica/pphtml/newsdetail15897.html

Town Seeking Protection for Man-made Cave

To some it may be an ancient site, to others simply a root cellar. Regardless of the origin, the officials in the town of Upton, Massachusetts are trying to protect a man-made cave from possible future development. The cave is currently owned by Gerald Cuccione who purchased the 7.5-acre property that contains the cave in June 2004. Discussions are underway with Cuccione either to donate the cave to the town or to negotiate a purchase price.

The origins of the cave have been a matter of debate for years. Some even believe that it may be more than 1,000 years old and liken it to Stonehenge. James Mavor, a retired oceanographic engineer studied the cave from 1980 to 1985 along with Byron Dix, who was a specialist in the astronomy of ancient cultures. Mavor and Dix, have suggested that two nearby stone cairns were created at the same time as the chamber—around 700 to 750 AD. He continues to believe that the cave is ancient and that the stone chamber could possibly have been used as an astronomical site or an observatory constructed by Native Americans, Irish monks or Europeans.
The Massachusetts Historical Commission feels that it deserves further study. Commission spokesman Brian McNiff said,"It's believed to be Colonial and not prior to European settlement." Curtis Runnels, Boston University archaeology professor agrees saying that it is"just wishful thinking and fantasy" to believe that the structure predates Colonial times. Runnels also adds that archaeologists do not believe that Europeans were in Massachusetts before 1500.

Despite the debate, Upton Historical Commission member Cathy Taylor remains inspired to work on preserving the chamber and says,"To have a site right here in Upton that also seems mysteriously old and [astronomically] aligned is exciting."
http://www.boston.com/news/local/articles/2005/02/27/town_seeking_protection_for_manmade_cave/

Florida Residents Evacuated After Testing Finds 80-Foot Cavern Below

Residents of the Shady Oaks Mobile Home Park in Columbia County, Florida were evacuated from their homes on March 18, 2005 when initial testing proved that an 80-foot cavern lay below the park and that the ground had become unstable. This district in the county had six sinkhole incidents in less than a month prior to the evacuation. County Commissioner George Skinner was not taking any chances stating,"We felt like with the data we had, we should evacuate the people in the mobile home park." He also added that they could not predict what could happen and could not rule out a possible collapse of the mobile home park. Skinner added, "It is a serious problem, all we can do now is ensure the public's safety."

Some wells in the area also tested positive for *E.coli* and Health Department officials issued a boil-water notice within a one-mile radius of the area. Nearby Pinemount Road was closed indefinitely when a growing sinkhole opened just 70 feet from the road. Cal-Tech engineer John Dorman lowered a camera into the cavern beneath the mobile home park while the Florida Rural Water Association conducted tests with ground penetrating radar and sonar in the area.

Possible heavy rains were the cause of the sinkhole collapses in the county and the official count now stands at 10. Despite all of the tests, local officials still do not have definitive reasons for the sinkhole development. Harvey Campbell, public information officer for Columbia County Emergency Management said,"We don't have any expert, outside evaluation and forecast of what to expect at this point." The state Department of Environmental Protection is expected to study the sinkholes and provide input. Meanwhile, some smaller holes have been filled in and others continue to be monitored.
http://www.lakecityreporter.com/articles/2005/03/20/news/top_story/news01.txt; http://www.lakecityreporter.com/articles/2005/03/22/news/top_story/news01.txt; http://www.lakecityreporter.com/articles/2005/03/31/news/top_story/news01.txt

Virginia's
Official State Bat

by D.L. Silverman

James Kiser

Coryhorhinus townsendii virginianus, Virginia Big-Eared Bat in a Jackson County, Virginia cave.

On Monday, March 28th, Virginia Governor Mark Warner signed bill H.B 2579 designating the Big Eared Bat, *Coryhorhinus townsendii virginianus* as the official state bat of the Commonwealth.

The bill was sponsored by Del. Jackie Stump and was originally requested by the Virginia Cave Board to help educate the general public about the benefits of bats. The Virginia Cave Board was formed in 1979 and promotes the protection of cave resources.

The Virginia Big Eared Bat was added to the U.S. Fish & Wildlife Service list of federally endangered species on November 30, 1979 and is only found in caves in Virginia, West Virginia, Kentucky and North Carolina.

Bat populations have decreased because of the use of pesticides, habitat loss and human disturbance. In Virginia, big-eared bats inhabit only 5 caves. Their diet consists mainly of small moths and insects. In general, bats offer an amazing natural way to control pests—one bat can consume 600 mosquitoes per hour. Del. Stump noted that this is especially important since West Nile virus has been discovered in areas of the United States.

Craig W. Stihler, WV Div. Nat. Resources

Hibernating Virginia big-eared bats.

Virginia's big-eared bats reside year-round in caves. They are extremely sensitive during hibernation. Each time a bat is disturbed, its body uses more of the fat that it has stored to help it survive the winter. Bats can actually starve to death if they are disturbed too often during hibernation. Maternity colonies are also very sensitive. A female big-eared bat has only one pup per year. If the colony becomes frightened, baby bats may be abandoned or fall to the floor where they become prey to other cave animals.

In order to protect the bats, cave gates have been constructed and educational signs posted at critical sites. Some caves are even closed when the bats are using the cave.

Judging from the press that has been generated on the radio, in newspapers and on the Internet regarding the big-eared bat, it looks as though the Cave Board has accomplished their objective. Joey Fagan, of the Virginia Department of Conservation and Recreation stated in an article in the Roanoke Times, "I think as a symbol it gives a good indication the commonwealth values these resources. One of the big things it will do is help people realize these are useful animals and not something we need to be afraid of."

For more information about the Big-Eared Bat:

Bat Conservation International: www.batcon.org

West Virginia Dept. of Natural Resources: www.wdnr.gov

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Donna Kirkpatrick

In Memory of Jonathan Mela
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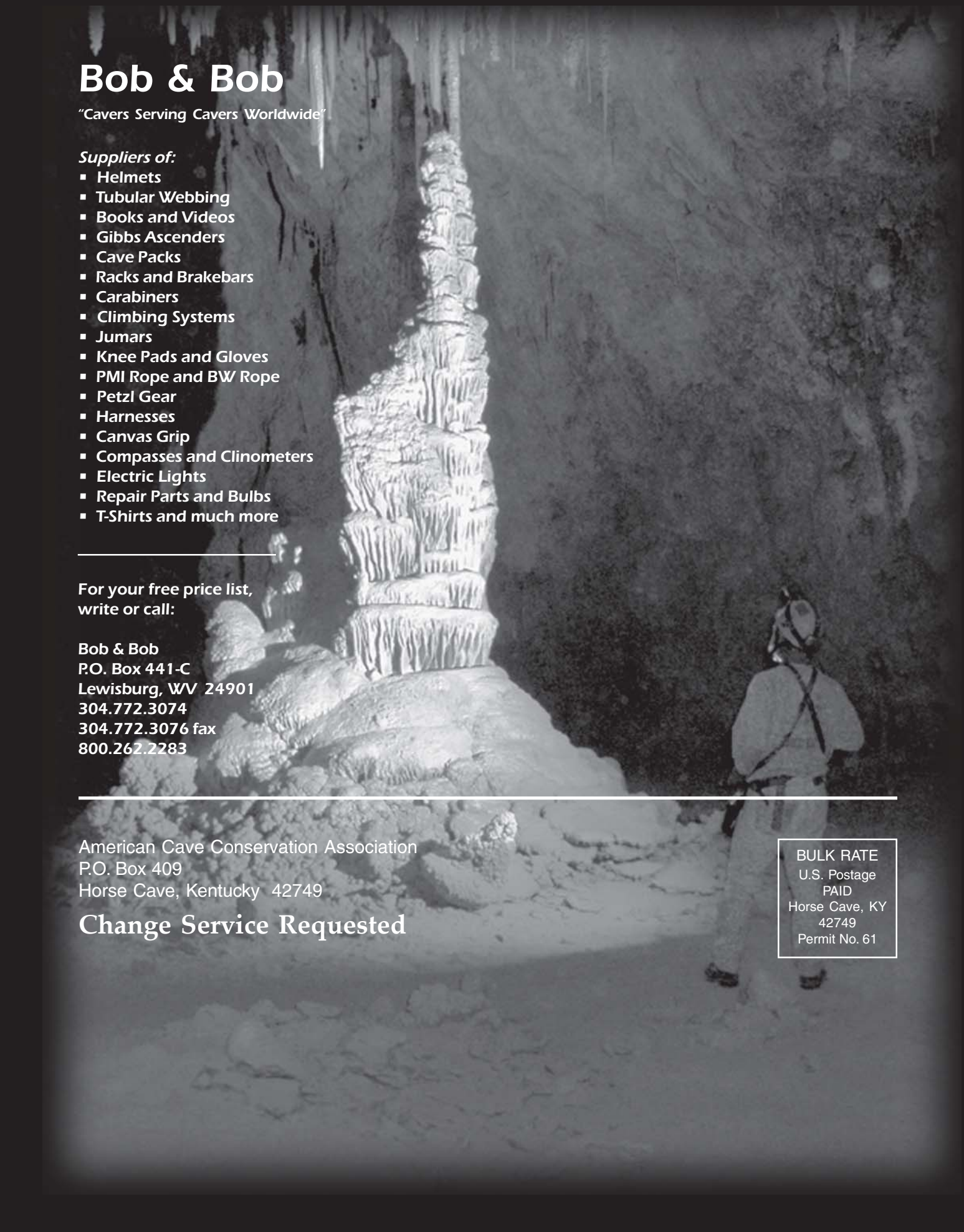
Jonathan L. Mela

ACCA member and supporter, Jonathan L. Mela, passed away Wednesday, January 12, 2005, at home. A native of Alexandria (VA), Jonathan had been a Richmond resident over 20 years. He was a professional trumpet player and graphic artist, avid traveler and outdoorsman, and devoted to wildlife conservation. He especially loved skiing and caving. He is survived by his wife, Elizabeth Ann Moon; his parents, Don and Doris Mela; his sister, Yonie Dow; his brothers, Samuel and David Mela. His family requested that memorial contributions be made to the American Cave Conservation Association.



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