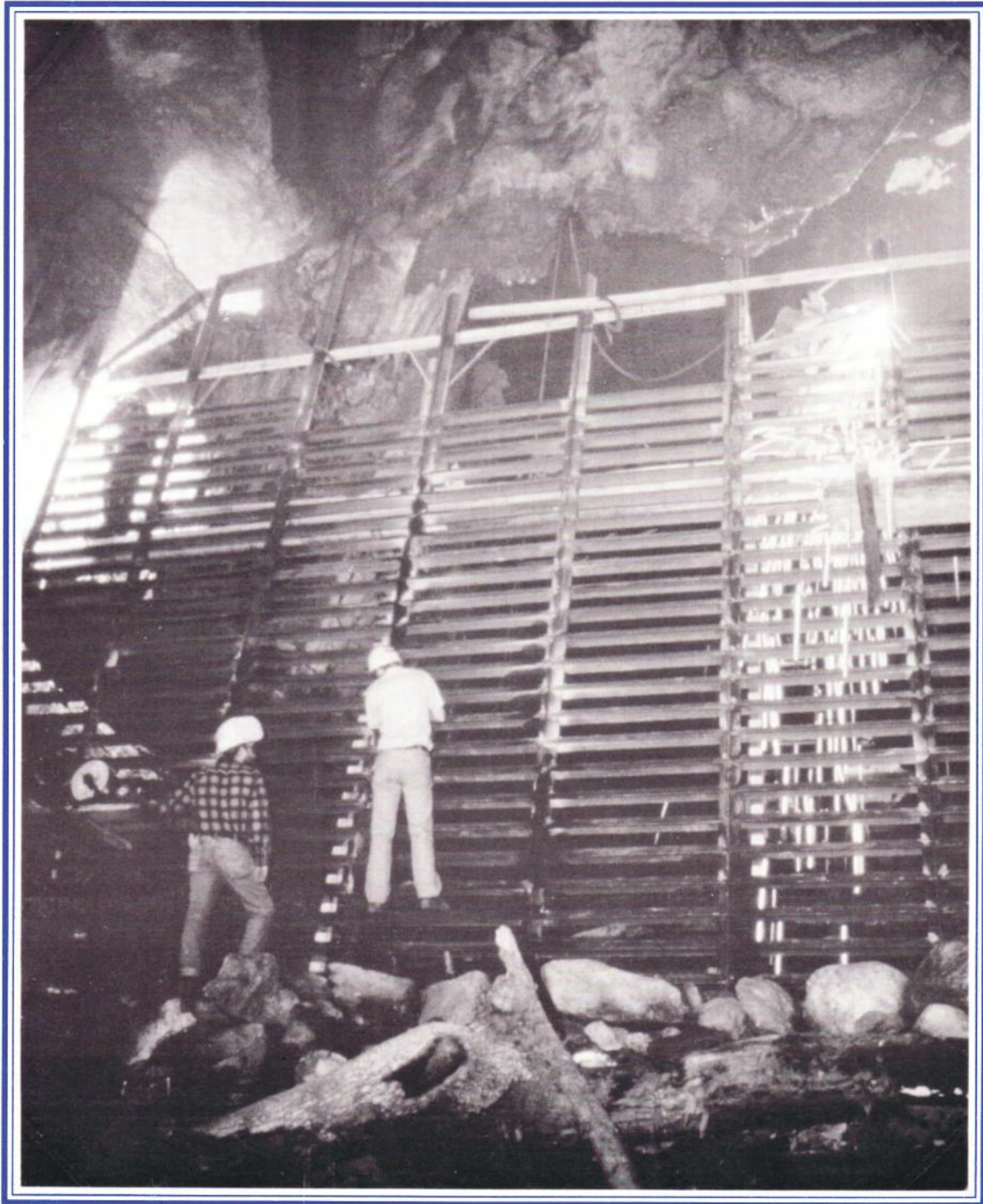


# American Caves

Summer-Fall 1996



A publication of the American Cave Conservation Association

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ACCA received contributions from approximately 500 members and community volunteers over the past year. We regret that there is not room to list each individual in this publication. Your support is greatly appreciated.

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*Please accept our apology if we have not included your name, and contact us so that we may correct our error.*

**Season's Greetings from the  
Directors and staff of ACCA!**



# American Caves

Vol. 9, No. 2, Summer-Fall 1996

Editor: William R. Elliott, Ph.D., 12102 Grimsley Drive, Austin, TX 78759-3120, E-mail: welliott@mail.utexas.edu, work 512-475-8802, home 512-835-2213.

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**Our Covers—** Our front cover is of the bat gate being constructed at **Hubbard's Cave, Tennessee**, in 1985. Our back cover shows the inside of the gate at **Coach Cave, Kentucky**, in 1993. Both were built to protect endangered bat species. Please see the first feature article for details. Photos courtesy of Dr. Merlin Tuttle, Bat Conservation International and Honorary Director of ACCA.

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# A Message from the Executive Director

Dear Member,

As 1996 draws to a close, I am more excited than ever about the future of the American Cave Conservation Association. We are approaching our twentieth anniversary as an organization and our fifth year of operating the American Cave and Karst Center.

Let's take a moment to look at where we are going. We have already raised more than \$1.4 million to create an educational center and museum for caves. We are in the process of developing a strategic plan to map out a clearer direction for our growth.

In the next few months, we hope to be acquiring Hidden River Cave. For many years now, we have worked with other landowners and managers to protect caves. As we take on the role of cave manager ourselves, we want to set an example by being good stewards of this unique and valuable natural resource.

A major unfinished goal is the completion of the American Cave and Karst Center. The facility that we now have is far from finished. We need to expand our educational and exhibit offerings at the Center, as well as our ability to provide educational outreach.

As we grow, we want to find ways to reach out and help people who are working to protect caves throughout America. We are already doing some of this. Our Vice President, Roy Powers, has been a one man ambassador in his efforts to build protective gates at significant caves

throughout the United States.

We currently have Chapters in Virginia and Tennessee. Director, Jim Nieland, is leading the effort to establish an ACCA Chapter in the Pacific Northwest. You can read about the Northwest Chapter's Christmas Tree Gating Project in this issue.

My main concern is that, as we grow, we don't lose track of you. ACCA desperately needs the support of people, like yourself, who care about caves. An organization cannot accomplish anything without strong, committed individuals behind it.

Because of the strength of your commitment, ACCA has always aimed for the moon. We may on occasion fall short, but in the long run we have overachieved because we set our goals so high.

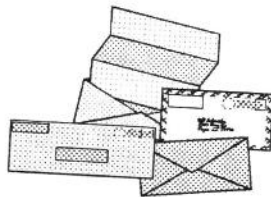
Please remember how important our work is the next time you see a favorite natural area that someone desecrated. Don't let something you love be ruined because you were waiting for someone else to step up and solve the problem. We need you behind us now more than ever.

Thank you again to the many donors and volunteers who have made this past year successful!

Sincerely,  
David G. Foster  
Executive Director

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## LETTERS



Dear Mr. Foster,

My fiancé & I just got our membership cards to the ACCA and are happy to be a part of an organization dedicated to the conservation of caves & the education of people in that regard. We were very impressed with the cave & karst center and the guide, Nancy, was extremely knowledgeable... As cavers, we all see some horrible things at the caves we visit. While in the Mammoth Area, we stopped at a store on Mammoth Cave Rd. called the Old General Store, I believe... We were upset to see boxes of broken stalactites and other speleothems in a room inside for sale. We've heard this is a problem there with cave vanda-

lism, but we thought we'd mention it.

—Cynthi Adam & Scott Pahlow  
Galion, Ohio

Dear Cynthia & Scott,

Thank you for joining the ACCA. As you discovered first hand cave vandalism is an ongoing problem in Kentucky, and other places. The conviction of the cave vandals who destroyed Floyd Collins' Crystal Cave last year brought a lot of attention to the problem. Several rock shops in the area are no longer advertising or selling cave rocks. Unfortunately, there are still a few bad actors around. The caving community can do a lot to help us police this situation. To report the illegal sale of cave formations in the area around Mammoth Cave please contact: Detective Steve Roberts,

Kentucky State Police, Post 3, P.O. Box 68, Bowling Green, KY 42102-0068 or call (502) 782-2010. Kentucky's cave law will only be enforced if those of us who care about caves are diligent about keeping the pressure on these scofflaws.

—David G. Foster

P.S. I want to personally express my appreciation to the dozens of people who wrote letters to Judge Thomas Russell in regard to the Floyd Collins' Crystal trial. Thanks for caring!  
—Dave

Dear ACCA Museum Personnel,

Thank you for providing our 8th grade students from Team 2001 an excellent introduction to our karst heritage in central Kentucky. The students & faculty certainly appreciated your efforts and professionalism. We had a great time!

—Bruce Haggerty  
J.T. Alton Middle School

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## ACCA Update

### ACCA Holds Teacher Workshops

This past year, ACCA staff conducted **ten teacher workshops** in cave ecology and karst groundwater throughout Kentucky. Each workshop consisted of lectures from karst experts, activity demonstrations by ACCA staff,



*A recent teacher workshop at the American Cave and Karst Center featured this sinkhole model demonstration, with plastic bottles, by volunteer Joe Bradford, ACCA Education Coordinator. Photo by Rick Olson.*

and a field trip to a local karst area. The workshops provided each teacher with six hours of professional development credit, and **176 teachers** participated in the workshops. Workshops were held at the American Cave Museum, Mammoth Cave National Park, Otter Creek Park, Salato Wildlife Education Center, Carter Cave State Park, Big South Fork National Recreation Area, and Larue County High School. Anyone interested in participating in the 1997 teacher workshops should **contact Nancy Korabik at the ACCA office, (502) 786-1466.**

### Hidden River Cave Purchase Underway

ACCA and the Department of Mass Transportation are in the process of conducting appraisals of Hidden River Cave and adjacent historical property. ACCA has been successful in raising approximately \$420,000 from Transportation Enhancement funds and the James Graham Brown Foundation to date for land and building purchases. Construction of a new interpretive walkway into the cave is also planned. We are also seeking donations to enable us to purchase additional sections of Hidden River Cave. Anyone interested in making a **contribution** should **contact Dave Foster, (502) 786-1466.**

### Educational Programs at The American Cave and Karst Center

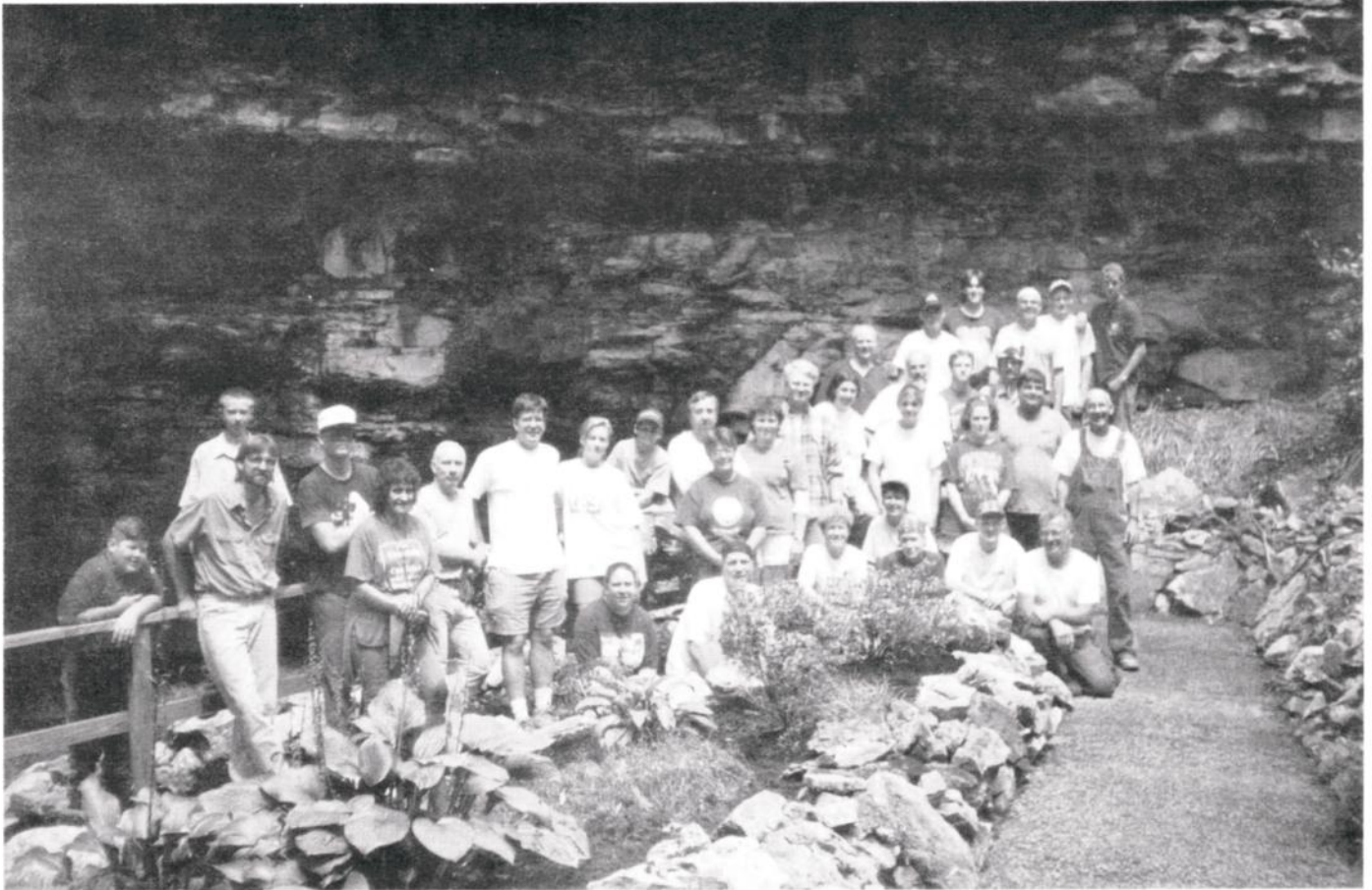
The ACCA staff conducted group activity programs at the American Cave and Karst Center for approximately **2,000 school children** in 1996. Each group who visited the Center received a tour of the American Cave Museum and Hidden River Cave, and chose two or three activities such as Native American Programs, Flintknapping, Water Testing, Karst Geology, Sinkhole Models, and Community Planning. Participation in these programs has increased every year since we began offering them in 1993. We are anticipating a banner year in 1997 after having mailed out more than 8,000 information packets to science and history teachers this fall.

### Cavers Help Spruce up Hidden River Cave

Over the past year, three groups provided volunteer assistance to spruce up the entrance sink of Hidden River cave. On May 4, 1996, about a dozen members of the **Cleveland Grotto** of the National Speleological Society (NSS) continued their annual tradition of holding a spring

work project in Horse Cave. The group picked up litter, cleaned out brush, and displayed their masonry prowess by beginning to restore an old stone wall that borders the walkway to the cave. On May 17, several members of the **Windy City Grotto** of NSS contributed a day of hard labor to continuing the wall restoration work begun the previous

work day. On August 15, members of a **Restoration Field Camp**, sponsored by Mammoth Cave National Park and the NSS, helped complete a major section of wall restoration and continued the effort to clean up the entrance sinkhole (see photo below). Thanks again to all who participated. We hope to see you again next year!



## **November 2, 1996, ACCA Board of Directors Meeting**

The following business was conducted at the Fall 1996 Board Meeting: ACCA staff and Directors provided reports on various program activities including: cave gating, purchase of Hidden River Cave, Chapter activities, educational programs, and fundraising. A motion was approved for members who designate chapter affiliation to remain a member of that Chapter until they declare otherwise. The Board voted to give staff volunteer **Joe Bradford a Life Membership in the ACCA**. Over the past year Joe has donated more than a thousand hours to assist with ACCA's educational programs. Guest Mike Yocum with the Cave Research Foundation reported on the status of a cooperative CRF/ACCA project involving computerized cave survey data. Jim Nieland reported on plans to host a cave gating seminar and preparations for the upcoming **1997 Karst and Cave Management Symposium on October 6-10, 1997 in Bellingham, Washington**, which will be co-hosted by the Northwest Chapter of the ACCA. In general business, a 1997 budget was approved and the following nominees were chosen to be listed on the election ballots for the January 1, 1997-December 31, 1999 Board Terms: Patricia F. Daugherty; Dr. William R. Elliott; Dr. Michael J. Harvey; Dr. Horton H. Hobbs III; Roy D. Powers, Jr.; and Jim Richards.

## New Staff Members Join ACCA's Team

**Nancy Ann Korabik** recently became ACCA's new Education Coordinator. Nancy will be responsible for planning and conducting group educational activities and assisting with guide training. Nancy has been involved with cave exploration in the Mammoth Cave area since 1990 with the Cave Research Foundation. She served as CRF's Eastern Operations Equipment Manager and Caretaker of the Hamilton Valley facility for the past three years.

**Sue Aspley** is our newest full time interpreter. During the off season, she will also be assisting with Fundraising

efforts. From 1979 to 1994, Sue served the United States Air Force as a military lawyer. Sue brings terrific communication and data processing skills to the ACCA.

## ACCA Gating Projects

ACCA's Vice President of Conservation, Roy Powers, has constructed **20 gates** on sensitive cave sites this past year, including 6 sites in Virginia, 6 in West Virginia, 5 in Illinois, 1 in Maryland, and 1 in Missouri. According to Roy, 95-98% of Virginia big-eared bat maternity and hibernating sites are now protected.

*The Mammoth Cave restoration workshop group worked hard at ACCA headquarters. Photo by Debbie Foster.*



## Calendar of Events

**February 13-16, 1997. Conservation and Protection of the Biota of Karst**, Nashville, Tennessee. The Karst Waters Institute will host the meeting at the Regal Maxwell House Hotel. Many cave biologists will attend. On Saturday, February 15, attendees will take a bus trip to Mammoth Cave, followed by a wine and cheese reception at ACCA's American Cave Museum! The \$150 registration is already due, but you may contact: Biodiversity Conference, Karst Waters Institute, P.O. Box 490, Charles Town, West Virginia 25414.

**March 15, 1997. Don't Mess with Mammoth Day** (please see news item on next page).

**September, 1997. A cave-gating workshop** will be held in two one-week sessions for 12 students each. Students will learn how to build a bat gate, hands-on at Boulder Cave, near Yakima, Washington. Sponsored by ACCA, Bat Conservation International, and U.S. Forest Service. More details in the next issue. Contact Jim Nieland, USFS, Mount St. Helens, 12178 Lewis River Road, Ariel, Washington 98603-9713, phone (360) 247-3946.

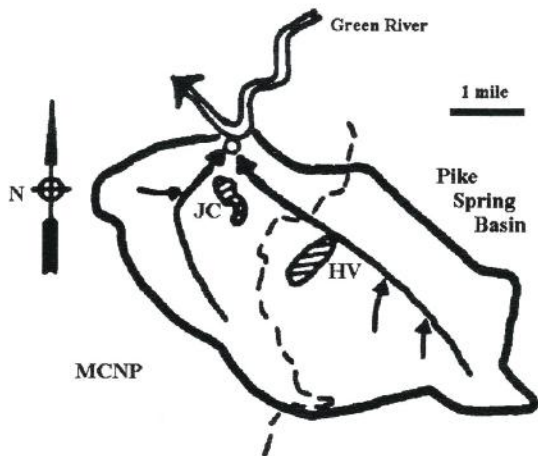
**October 6-10, 1997.** The biennial **National Management Symposium** in Bellingham, Washington, will be co-hosted by the Northwest Chapter of ACCA, USFS, National Speleological Society, and the British Columbia Speleological Federation. This year it will be titled the "**Karst and Cave Management Symposium.**" There will be field trips to Mt. St. Helens, southern B.C., and northern Vancouver Island. Costs are not known yet. Contact Jim Nieland, USFS, Mount St. Helens, 12178 Lewis River Road, Ariel, Washington 98603-9713, phone (360) 247-3946.

**October 30-31, 1997. Karst-water Environment Symposium & Workshop**, Roanoke, Virginia. A multidisciplinary forum to discuss a large number of engineering and ecological topics. Contact Dr. Tamim Younos, Associate Director, Virginia Water Resources Research Center, 10 Sandy Hall, Virginia Tech, Blacksburg, Virginia 24061-0444, phone: 540-231-8039 FAX: 540-231-6673, E-mail: tyounos@vt.edu

## Don't Mess with Mammoth Day, 1997

On Saturday, March 15, 1997, volunteers will team up at the **old Job Corps Site** on Flint Ridge within Mammoth Cave National Park (MCNP) to help restore proper ecological function to this site. Folks from the American Cave Conservation Association (ACCA), the Cave Research Foundation (CRF), and MCNP will team up. Major tasks will include removal of scrap metal and other scattered rubbish, elimination of soil erosion problems, and control of kudzu (a prolific plant).

The old Job Corps site is located within the **Pike Spring Basin**, which is prime habitat for at least a baker's dozen of cave-adapted aquatic species, including the federal endangered Kentucky Cave Shrimp, and the Northern Cave Fish (a species of special concern). About one-fourth of the Pike Spring Basin lies in the park, and the remainder is within the **Mammoth Cave Area Biosphere Reserve**, where conservation of biodiversity is a primary goal.



Last year, Don't Mess With Mammoth Day was held in CRF's Hamilton Valley, just outside the park but inside the Pike Spring Basin. ACCA Volunteers played a major role in making that effort a great success. Cleaning up an entire drainage basin is a long-term project, and your support is crucial. The contribution of each person is felt in these team projects, and a special kind of synergy occurs when people who care about caves and karst work together toward a common goal. Just looking at what has been done in a single day, while having fun, gives each person a great sense of accomplishment. Please be a part.

If you would like to help, contact **Rick Olson** at Division of Science and Resources Management, Mammoth Cave



*Lee Cox (ACCA volunteer) poses by a pile of trash that was removed during the 1996 "Don't Mess with Mammoth Day." Photo by Jennifer Miles.*

National Park, Mammoth Cave, KY 42259 (502-749-2508). Don't Mess With Mammoth Day will run from 9:00 AM to 5:00 PM Central Time; and **lunch will be provided**. Wear boots, sturdy work clothes, and gloves. Bringing a hat, insect repellent, rain gear, sunglasses, and drinking water is recommended. ACCA, CRF, and MCNP are equal opportunity employers of volunteers!

## Northwest Chapter News

### Lavacicle Cave Re-gated

Ric Carlson coordinated the successful re-gating of Oregon's Lavacicle Cave in October. This project, in cooperation with the Deschutes National Forest, replaced the old solid steel door with a new "bat friendly" gate of ACCA design.

When a survey of the cave revealed large quantities of old bat guano, and no bats, it became apparent that the gate had excluded bat use for almost three decades. In re-gating the cave we hope that bats will use the cave again.

Lavacicle Cave was discovered in the late 1950's by a Forest Service fire fighting crew and found to contain large lava drip stalagmites. Over the years the cave has seen a series of gates intended to prevent damage to the unique geological features. We discovered only recently that bats had been excluded. The chapter is considering a project to restore broken formations, including the famous four-and-a-half-foot high "Horse's Head" stalagmite that was broken almost 10 years ago when the cave was broken into and vandalized.

*Continued on page 18...*

# THE EVOLUTION OF CAVE GATING

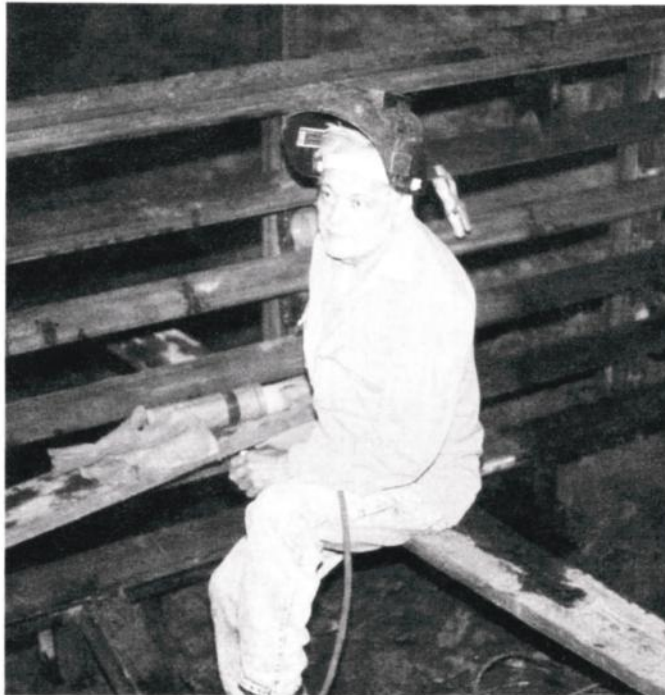
*How the philosophy and technology have changed*

by William R. Elliott

## Expert Gaters

Engineer and renowned cave conservationist, Roy D. Powers, Jr., of Virginia has been caving nearly 48 years—since he was ten years old. Roy has built twenty cave gates this year—120 in his lifetime. Roy, who is ACCA's Vice-President of Conservation, is sought after by private conservation organizations and state and federal agencies. He has engineered and consulted on more than 600 gates from Virginia to Arizona, New Hampshire to Alabama. For twenty years he has innovated the design and fabrication of cave gates in cooperation with cavers, biologists, archaeologists, and conservationists. As Roy puts it, "One reason I got into cave gating big time is that when I go into caves that I visited years ago, they're not the same. They're messed up. They're destroyed. The biology is trashed. A normal caver who just joins a grotto and caves for two or three years doesn't see this. If you take anybody who has been caving, say twenty years (sometimes it takes that long), they begin to notice, and they begin to appreciate the protection efforts a little bit more."

Roy's first cave gate in 1966 was at Salamander Cave, Virginia, then a virgin cave. He almost fell into the pit entrance while searching for it at night. The explorers rigged up a gate from an old trailer frame, gleaned from a junkyard, and anchored it with cables. At that time his motivation was from the explorer's viewpoint, to protect a



*Roy D. Powers, Jr., pauses from work on a bat gate in Starr Chapel Cave, Virginia. Photo by Dawn Kirk.*

pristine cave that he wanted to explore.

Now Roy's motivation is to protect resources, not just exploration. By the end of this year he will have helped protect 95-98% of the roosts for the Virginia big-eared bat, an endangered subspecies that is known from only 15 caves.

Tony McGee has built or collaborated on about 200 cave gates in the Tennessee area. Tony is an engineer, and he talks about the "bending moments" of different lengths

of angle iron. Of his gates, 90% are on private land; the rest are 7% state, 2% federal, and 1% city land. About 40 or 45 caves were gated for bat protection, and the rest were for safety and "retaining access." In at least one case, the owner was planning to dynamite a cave until the cavers offered to gate it. Tony also has gated five abandoned coal mines, some of which had long-eared or gray bats. Tony also is an instructor in the National Cave Rescue Commission, so many of his gates are designed to allow a fully loaded stretcher through the door.

Mike Warton has built 135 cave gates, all in Texas. His first was O-9 Well in 1975. About 97 of his gates are on private land, 2 on university land, 1 on state land, and 35 on Army reservations. Of these, 75 or 80% are for endangered or rare cave invertebrates and 12% are for bats. Mike may be remembered for his illustrations and gate plans in the *Cave Gating* manual of 1975.

Marion Vittetoe of Arizona started gating caves in 1984, primarily to protect delicate caves. About 25% of his 25 cave gates have been to protect the caves *per se*, but 75%



Mike Warton drills anchor holes with a hammer drill at Off Campus Cave, Texas.

have been for bats. He's worked extensively with Dr. Virginia Dalton for the last seven years on bat cave gates. One gate was built to protect paleontological resources (animal fossils). Marion has also built gates on five different mine sites, some using up to three gates each. Abandoned mines are turning out to be very important bat roosts in the United States. Most of Marion's work has been on federal land in Arizona, but

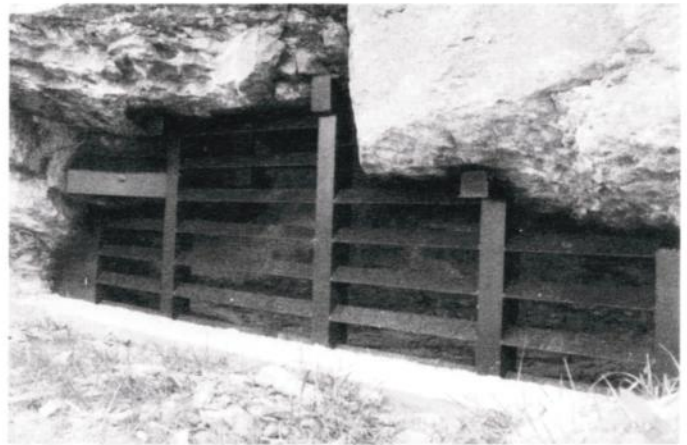
some gates were on state land. He'll soon be gating a water tunnel that was scheduled to be sealed until it was found to be a bat roost.

Jim Nieland, an ACCA director, started gating caves about 1991, both as a volunteer caver and on the job as a U.S. Forest Service cave specialist. Jim has built 13 gates; ten of his gates are on federal lands in the Washington-Oregon area, while two are on state land and one is on private land. Eight of the gates were for bats, one for invertebrates, two for geologic features, and one for archaeology. Only 1% of Northwest caves and mines are used as bat maternity sites, usually by the declining *Plecotus townsendii* (Townsend's big-eared bat.) About 5% of the caves are important hibernacula (winter hibernation roosts). Jim estimates that if every worthy cave in the Northwest were to be gated, only 6 or 7% of all their caves would be affected, leaving at least 93% available for unrestricted recreational use.

Jim Hathorn started gating caves in 1982 and has built six, all in Idaho. The gates were basically for resource protection, but one was for safety after an accident occurred. He and the Gem State Grotto work as volunteers; they have built one gate for the National Park Service, five for the Bureau of Land Management, and will soon be working on two new gates for Papoose Cave (Forest Service) after much discussion with cavers and experts about the cave's climate.

### Early Cave Gates

In the early days of cave gating, steel plate doors or salvaged jail cells were slapped on caves. This either excluded the bats or changed the cave's temperature profile to where they could no longer use it. Biologists discovered that a raised concrete sill across the bottom of the gate could



A massive, "early modern" bat gate on Canoe Creek Mine, Pennsylvania, by Roy Powers. This protects the largest hibernating colony of Indiana bats in the state, and four other species. The mine also intersects caves.

block the flow of cold air into the cave, affecting a bat hibernaculum. Cold, dense, winter air often flows along the cave floor like a fluid, and a raised sill can act like a dam. Different species prefer different temperatures, so it is best to protect natural air flow and water flow patterns. Some cave gates actually caused the decline of hibernating populations of Indiana bats and gray bats, two species now on the endangered species list.

Many early cave gates were flimsy things made of pipe, and were not anchored well enough to prevent vandals from tunneling under them or bending them to go around. In 1975 the National Speleological Society published its *Cave Gating* manual, which was the first of several influential documents on the subject. The manual had useful information about building stronger gates, but leaned toward the "weak link" philosophy of cave gate design, which is to create a weak area in the gate so that it can be broken without wrecking the entire gate. That way, the theory goes, most intruders will be kept out and the gate can be repaired easily. Most cave gaters have abandoned the weak link philosophy, or make the weak link stronger than before. Roy says, "I never believed in that. If you're going to protect the resource, you protect the resource. You're not putting something there to protect itself! If the vandals attack your gate, the philosophy is you fix it as quick as possible and outlive them."

### Frustrated Vandals

Roy delights in frustrating vandals. Many of his cave gates have a large steel skirt in front of the gate. The skirt is buried under heavy rocks. By the time vandals dig down to the skirt they're usually tired and would still have to tunnel

six or seven feet to get under the gate. None have succeeded. Concrete is rarely used to finish the edges of a large gate because it eventually deteriorates, but if he does use concrete, Roy uses massive amounts.

Most cave gaters still use mild steel because it's easy to work with and strong enough. Mike uses "modified" steel, which is slightly stronger. Mike brushes his gates with Rustoleum. Roy, instead of coating the gate right away, lets the gate rust a bit, then coats it with automotive "Extend," a water-based product that reacts with the iron oxide to form a stable coating. He favors stainless steel locks with brass tumblers, such as those made by Best Co. and Master Lock. Mike likes Olympus brass locks, and Marion Vittetoe likes Medico brass locks. All of these are corrosion resistant and have a 1/2-inch diameter shackle. Roy usually leaves a small can of WD-40 hidden behind the gate for cavers to lubricate the lock. He hasn't had any lock failures, except for those that were mutilated. A good cave gate will have the lock inside a hard-to-reach box inside the gate, accessible only by feel through an armhole in the gate. This prevents the direct application of levers and cutting tools on the lock. Mike sometimes puts two large locks and hasps on his gates for extra strength and security.



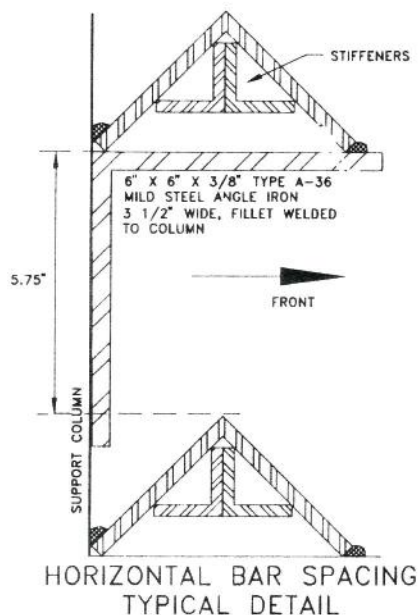
The bat gate at Gustafson Cave, Arkansas. Photo by Roy Powers.

Roy does not anchor his gates with plain re-bar, but uses heavy hangers made of plate or angle-iron. He drills a one-inch hole in the hanger and welds a one-inch-thick pin through it. The six or eight-inch square hanger gives him more room for attaching pieces of the gate. Most gaters use a hammer-drill to imbed the pin 8 or 10 inches deep in the bedrock.

Roy originated the stiffener, or angle-within-angle-iron design, and the turning of the angle-iron bars to cut the drag on air flow. Various angles were tried with the advice of friends, until the current configuration, with the apex pointed up, became standard. With stiffer bars vandals cannot use jacks to bend the gate open, and the design has more widely spaced vertical columns, which is better for the

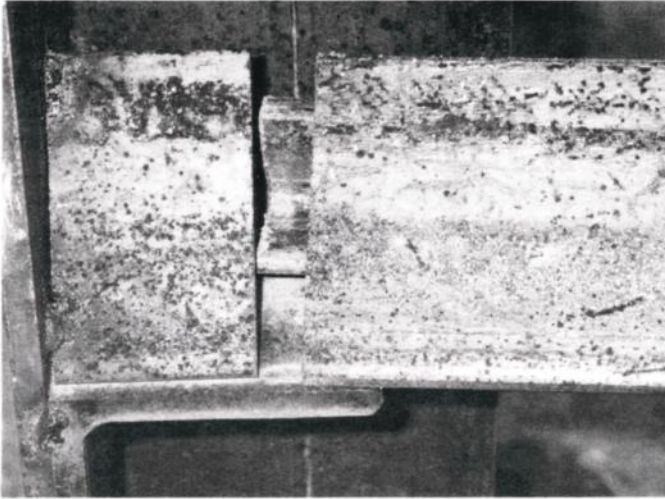
gates because they need all the room they can get to fly out. The best way to stiffen horizontal bars, Tony thinks, is to use heavier, tougher steel, such as 5/16 or 1/2-inch-thick angle iron. He spaces his vertical columns at four to five feet when using 3/8-inch-thick angle. Tony likes to harden gate parts by welding old tool bits inside the horizontal bars or filling pipes with concrete and tool bits. This will stop hacksaws very quickly. The same effect can be obtained by welding beads from harder welding rods on the surface of the gate.

Jim Hathorn likes to use the "psycho lock," an invention of Roy's that can fool vandals. The gate actually has two locks, one hidden in a vertical column and one more visible to the vandal. In one instance a vandal shot up three boxes of .22 shells to destroy a lock, but the hidden lock prevented entry.



### Stronger, Quicker, Better

Materials and technology have changed. Design changes are not as frequent now, but innovations take one to one and a half years to be published in the new plans periodically issued by ACCA. Now Roy is working on eliminating the door from the gate design. The door is the weakest area, and he is designing a movable bar that has only one moving part. This design will be available through ACCA in the near future. Marion has developed a dovetailed, removable bar design that has no hinges. Hinges should always be recessed. To protect hinges further, Mike welds strips of 1-inch flat bar over the hinge edge of the gate. Anyone who is interested in cave gating should check with ACCA and Bat Conservation International to get the latest recommendations.



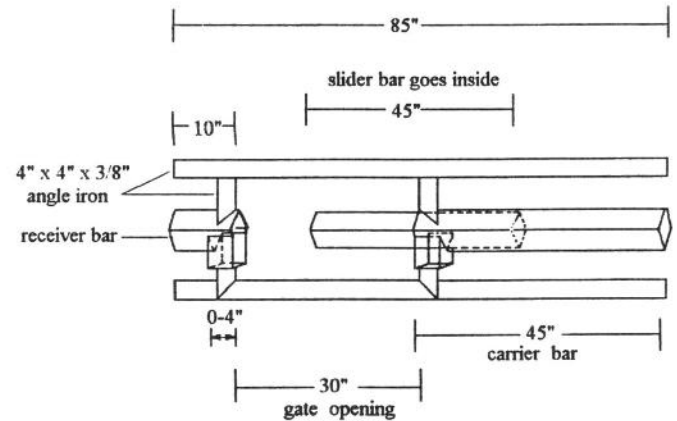
*Detail of bars that dove-tail, using stiffeners inside the larger angle iron. At the other end of the bar a lockable hasp fits through a hidden slot in the support. This type of gate has no door, just removable bars. Photo by Marion Vittetoe.*

Back in 1985, a massive bat gate like the one on Hubbard's Cave, Tennessee, took 10,500 man-hours to build. That gate protects two endangered bat species. The gate used vertical members spaced four feet apart. Recently Roy and Marion built a bat gate on Gustafson Cave, Arkansas. The gate was almost as big as Hubbard's, but took only 504 man-hours. The verticals were placed 10 feet apart, which is now possible because they stiffen the horizontal angle-iron bars. Roy thinks he could even go to 15 or 20-foot spacing of the verticals if he used 1/2-inch steel

and 2-inch angle for stiffeners.

The Hubbard's Cave gate, still the world's largest at 39 feet long, 31 feet high, and 70,000 pounds, was a learning experience for Tony McGee and Roy, who worked on it with many others. Extruded steel columns, which are square tubes, were used for the verticals, but when welded on one side the other side stayed cold, causing deformation and cracking. The Hubbard's gate needs repair as a result. Extruded columns also are difficult to adjust if they get out of alignment during fabrication. So, it is best to use large angle-iron instead of columns.

Marion builds small gates out of 2-inch square tubing, resulting in a gate that has less obstruction to air flow and animals while still being strong. On larger gates he uses the "t-bar" stiffeners inside the angle iron, like Roy, and he likes to use straight, heavy wall plates made of 6-inch-wide, 3/8-inch-thick angle. These are placed in front of and behind the large pins in the wall to protect them. He attaches the horizontal bars to these plates, and with this design he can avoid setting up verticals altogether on medium-sized gates. The design saves time because he avoids making elaborate



*Jim Hathorn's slider bar door uses square tubular steel inside a larger bar. A lock is hidden in the frame.*

cuts, but it requires finding straight walls or else modifying the wall a bit to accept a straight plate. This method saves time and results in a cleaner design too.

### How Critters and People Respond to Gates

Bob Currie, a bat expert with the U.S. Fish & Wildlife Service and an ACCA director, says that some bats, like the Mexican free-tail, do not tolerate cave gates at all, while others, like *Myotis grisescens*, the gray bat, tolerate a gate only if it is not a maternity colony. Merlin Tuttle of Bat Conservation International and his associates have found that some bats like gates better if they are back in the cave



*Marion Vittetoe anchors gates with heavy wall plates and large pins. These will be boxed in and concrete pouted into the frame for extra strength. Photo by Marion Vittetoe.*

where predators are less likely to attack them at the gate. John MacGregor found that some early bat gates actually caused most of the decline in Indiana bat numbers since the 1950s and 1960s. These gates blocked air flow and bats actually had to land on some of them to get through. Since then, better gates have allowed some of those populations to increase again.

In Texas, many caves have been gated for the protection of endangered or rare cave invertebrates. Mike uses 2½-



*Lakeline Cave, Texas, was gated to protect two endangered invertebrate species. The cave entrance had been burned out by vandals, so a double-lock gate was installed. Note the animal access hole at the far end of the sink for raccoons and mice. Photo by William R. Elliott.*

inch spacing on such gates if there are no bats. Such tight spacing will prevent a standard hacksaw from cutting through the bars but still allows air flow. However, bat gate designs are still used when the entrance is large enough, because the design, with 5¾-inch spacing between the bars, allows good air, water, and cave cricket “exchange.” Roy reports that six-inch spacing was used on earlier bat gates,

but experimentation showed that 5¾-inch spacing excludes all but a small percentage of adult humans.

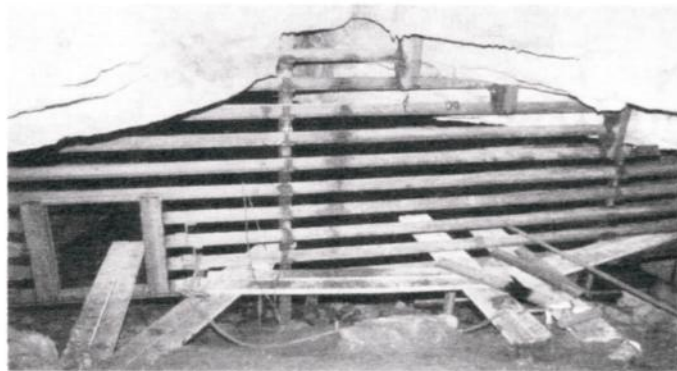
The cave ecosystem is dependent on cave crickets, raccoons, mice, and other critters to provide guano (droppings), which provides nutrients to certain species who feed directly on the droppings or on bacteria and fungi growing on the guano. These “grazers,” such as tiny springtail insects, are fed upon by other species such as spiders and pseudoscorpions. The cave crickets also support cave-adapted beetles, such as *Rhadine* in Texas and New Mexico, or *Neaphaenops* in Kentucky and Indiana. These beetles sniff out, dig up, and eat cave cricket eggs laid in the cave soil. Gate designs should not obstruct animals such as raccoons, who naturally use caves. In Texas, most cave gates have an eight-inch-diameter animal hole at one side or through an adjacent ledge, to accommodate coons and ringtails, but holes up to ten inches may be needed. Gates should not be covered with expanded metal or mesh, as that can hinder leaves and twigs from falling through a horizontal gate. Leaf litter can build up, blocking natural processes. Even in a dry cave, leaves and twigs are occasionally washed farther into the cave by runoff, providing nutrients and soil for invertebrates.

It is important to avoid polluting the cave environment when we build gates. Air flow patterns in the cave should be watched before welding starts, so that welding fumes can be directed out of the cave. In Gorman Cave, Texas, the writer had to set up a ventilation system to exhaust welding fumes out of the cave during construction of a bat gate. Box fans can be used in an entrance to blow fumes away from the cave and the workers. Metal slag should not be left on the cave floor—prefabrication of gate parts can cut down on such slag deposits. Spray paints should not be used in a cave environment—brushing the gate is better. And don’t smoke in the cave!

Occasionally some people will actively oppose the idea of a cave gate. About ten years ago Roy and Marion were asked by the Coconino National Forest, Arizona, to gate Crucifixion Cave. ACCA paid the \$1,100 costs for the gate. This is an unusual limestone cave overlain by a lava flow and lava tube, some of which broke through into the limestone cave. Only three other caves of this type are known in the U.S. The cave had bats and delicate features and needed management. Certain individuals voiced opposition to gating the cave. About two weeks after the gate was finished, someone cut the three-ton gate out with a torch, and it disappeared without a trace. Then ensued a tense period in which U.S. Marshals investigated and the vociferous few had a good scare, although no one was arrested. In the end, Arizona cavers offered to help put the cave gate back and the incident became an object lesson. Cave gates are now accepted by most cavers in that area, although Crucifixion Cave remains ungated. According to

Marion, a second cave gate disappeared in Arizona, and it has not been replaced.

The frequency of cave gate violations remains annoyingly common, according to Roy and Marion, but Roy thinks this is because there are more cave gates now. He thinks that the percentage of cave gates that are attacked has actually declined. Marion feels that attitudes are improving in Arizona, but some people still object to cave gates and threaten to destroy them. Probably five or six of his 25 gates have been vandalized—usually the door is taken off, but he repairs them. Roy is proud of the organized cavers in his area, many of whom have helped build cave gates. In Texas, most cave gate violations were done by uninformed noncavers.



*A new bat gate design in Molar Cave, West Virginia. Photo by Roy Powers.*

### Logistics

Marion Vittetoe recommends planning ahead and organizing people and equipment. He usually has four to eight people involved on each gate. He may make one trip to measure the entrance and another trip or two to build the gate. He has an inventory list that he checks off so he'll know what equipment or materials are missing. This list also allows assistants to pack up his tool boxes afterwards without him having to supervise them.

Roy doesn't prefabricate much except hangers with 1-inch pins in them. He prefers to build the whole gate in the field. In Texas, Mike Warton often makes careful measurements of a small entrance, prefabs the gate at his shop, then installs it on the entrance. Gates on small sinkholes with loose walls may have the edges finished with concrete. Gaters prefer to fill the entire hole with gate if the walls are solid; they occasionally pour massive concrete to anchor the bottom of an upright gate. If the gate is not built on bedrock, Marion often pours concrete over re-bar in a 7-inch deep trench, and anchors the sill plate to this footing at the bottom of the gate. Larger gates may warrant a deeper trench. Jim Nieland likes to measure the entrance at two-foot intervals and design the gate on a computer, which then gives him a materials list to buy. He prefers pre-fabbing

brackets and doors in the shop, where he has a large band saw that can cut these pieces much quicker and more precisely than with a cutting torch in the field. He has found a supplier who will deliver steel over 120 miles away at no charge!

Carrying the steel to the cave is a big job. Nieland has used a Honda "Toter," a machine with rubber tracks that handles like a wheel barrow, and which can carry up to 800 pounds. Then there's the "Libby Nieland Webbing Loop Technique," originated by Jim's wife. Fold a nylon webbing loop double, and wrap it around the steel bar forming a handle on each side. Two people, standing opposite, each grasp a loop handle with one hand and pick up the load. By adjusting the length of the loop on each side, one can compensate for height differences between people. Six people can easily pick up and move a 20-foot length of four-inch angle iron. With the straps, the angle needs only to be lifted six inches off the ground to be moved! The webbing loops grip the steel when going up or down hill, so control can be maintained.

In one instance a helicopter was used to move stuff over a mile from the road to the cave. They used a 150-foot line to lower sling loads between tall trees to the forest floor. The Forest Service used a similar method to gate El Capitan Cave, on the steep side of a glacial valley in Alaska.

Good lighting in the field is important. Nieland uses three or four halogen work lights. Small gates can be built with one welding machine, but two or more welders are needed for large gates. The welding is the most time-consuming operation. Space does not permit a discussion of all the methods used in welding the gate. Let us hope that a new cave gating handbook will be published in the future.



*A different bat gate, Venom Cave, Texas. Photo by Mike Warton.*

### Philosophy

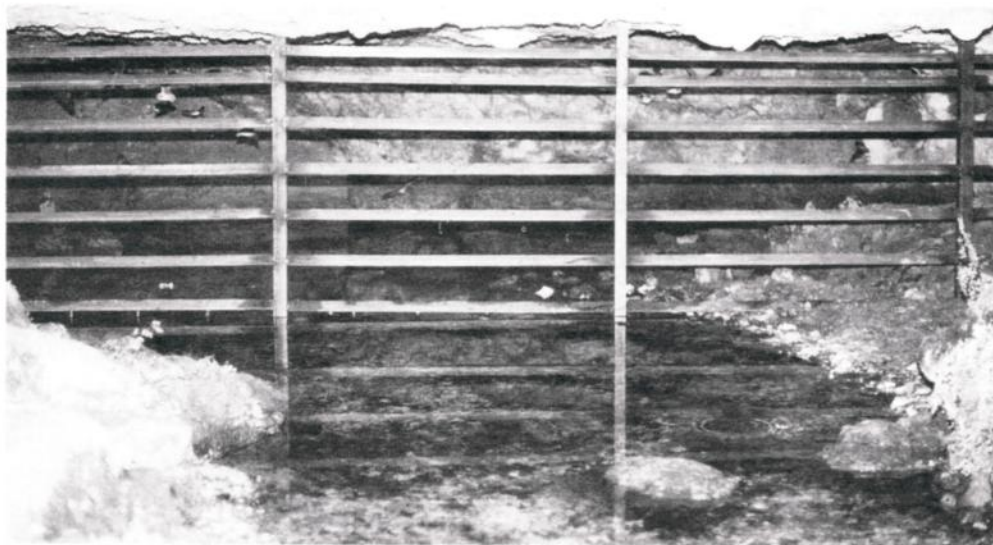
Jim Nieland says it takes technical expertise, coordination, many partners, and a willingness to work

together toward a common goal. Partnerships are the single most important element in successful gating. It spreads the cost among the partners, while developing consensus and commitment. The "Washington Cave Working Group" has developed to carry out cave gating projects. Nine organizations were involved in the recent gating of Christmas Tree Cave, Washington. (See Nieland's article on the gating of Christmas Tree Cave, in this issue.) The ACCA has been a catalyst in cave gating in the Northwest, but Jim recommends that anyone seeking to protect caves should try to develop a cave working group and invite all interested parties, because they all have something to offer.

To have a successful cave gate, Roy says, "The philosophy is basically simple. You certainly should educate the cavers as to what's happening and why. Usually, if they understand why, and you can involve them in the situation, you've got a much greater chance of success." Of course, vigilance is still required in the case of noncavers who never thought of the concept of cave conservation.

Looking back over his long years of effort, Roy muses, "Twenty years ago I probably wouldn't have gated a pristine cave just because it was a pristine cave. I don't have time to do that now because I'm trying to protect resources, and it's like stompin' out brush fires. But, if somebody's got free time and they have a pristine cave, and if they want it pristine ten or fifteen years from now, they'd better manage it. That doesn't necessarily mean a cave gate. They'd better manage it or it's not going to be there."

*The author thanks all the cave gaters who helped him write this article.*



*A bat gate in Spring Creek Cave, Texas. Note the flying bats (probably *Myotis velifer incautus*). Photo by Mike Warton.*

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# Washington's Christmas Tree Cave Gated— *Bats Protected*

by Jim Nieland, Northwest Chapter

## A Cooperative Project

Over three weekends between September 28, and October 13, Christmas Tree Cave in southwest Washington was gated for the protection of a maternity colony of Townsend's big-eared bats. The project was the culmination of a year of planning involving a consortium of Northwest conservation organizations and public agencies.

The Northwest Chapter of the ACCA and the Nature Conservancy of Washington provided administration of the project. The Nature Conservancy led negotiations with West Wind Timber Company, and the Washington State Department of Natural Resources, each of which own entrances to the cave. The Northwest Chapter developed gate designs, arranged for construction materials and equipment and coordinated volunteer workers during gate construction. The Nature Conservancy, in cooperation with the Washington State Department of Fish and Wildlife, funded purchase of gate building materials and supplies.

Valuable volunteer assistance was donated by Northwest Chapter members, the Northwest Regional Association of the NSS, Bats Northwest, Oregon Grotto, Willamette Valley Grotto, Puget Sound Grotto, Cascade Grotto, the US Fish and Wildlife Service, and the US Forest Service. The Washington State DNR lent the use of a large utility trailer for moving steel to the construction site, and provided right-of-entry permits for gate construction. Volunteers donated 667.5 hours of work to construct the two gates at the upslope and downslope entrances; both were ACCA-designed, zero-airflow-disruption, bat gates.

Particular thanks go to Patty Silver, Denny Barnhart, and Libby Nieland for providing meals for hungry workers, and to Steve Sprague, who drove 250 miles from his home all three weekends. Steve even bought a new portable welder to increase the speed of gate assembly. Special thanks also go to the Puget Sound Grotto for their \$80 cash donation used to help feed hungry workers, and all 46 volunteers who donated their time to the project.

## Project Details

The Washington Department of Fish and Wildlife has been monitoring bat use of the cave for over a decade. The west (upslope) entrance provides a maternity site for up to

250 Townsend's big-eared bats (*Corynorhinus townsendii*), and it is the only active maternity site for this species in the area. Biologists regard Christmas Tree Cave as key habitat for survival of the Trout Lake area population. They have long recognized the importance of this site, and have monitored the maternity colony using non-invasive techniques, such as counting bat emergences using night-vision equipment.

Surprisingly, Christmas Tree Cave also contains the largest hibernation colony in the Trout Lake area. It is unusual to find a cave that meets the stringent requirements for both maternity sites and hibernation. Only 1% of all caves in Washington provide suitable temperature conditions for maternity colonies, and only 5-6% are important as hibernation sites.

This cave never previously attracted much recreational use since breakdown chokes occur throughout its length, and it has few if any interesting features. Visitation has been low, and disturbance to bats has been within tolerable limits. During a mid-summer, 1995 survey, we discovered that someone had slashed a trail through a heavy growth of vine maple into the west entrance. The trail led directly to the area of the bat maternity roost, just inside the broad entrance.

This evidence of heavy disturbance created a near panic among State biologists. They based their concern on the general decline of the species throughout its range, and particularly in Washington State. The estimated population in Washington is only 2,500-3,000 animals. The Trout Lake population is about 500 individuals, (17-20% of the State population), making this cave the single most important bat habitat in south-central Washington.

Townsend's big-eared bats are both vulnerable and sensitive to human disturbance. Big-eared bats are almost exclusively cave dwellers. Before the arrival of humans, caves provided the species a stable and secure environment for reproduction and hibernation, but not anymore. As the human population of the area increased, and more people began visiting caves, they drove the bats from their favorite roosts into less desirable caves. They often repeatedly aroused the bats from hibernation, causing death by starvation. In some cases unscrupulous visitors intentionally killed roosting bats. Disturbance of maternity colonies caused females to abandon the roost and their young, causing death to their babies.

In the fall of 1995, word of the new trail arrived at the annual meeting of the Washington Cave Working Group.

(The Working Group is composed of representatives from public and private organizations interested in cave habitat protection issues in Washington State.) Following a briefing on Christmas Tree Cave, we realized a crisis was taking place, and we needed to take quick action to save the colony. We formulated a plan of funding and coordination for gating the cave. Various members offered assistance in negotiations with land owners, funding, design, and construction.

Timing of the project was critical. We could only construct the gate between "bat use seasons." Juvenile bats born during the summer had to be old enough to forage on their own, and no longer in need of nurturing from their mothers. If we did the project too late in the season, bats would be arriving from other caves, swelling the hibernation colony. The best choice was when only the resident mothers and their nearly adult young were present; the goal was to minimize disturbance of these residents. The last weekend in September and the first two weekends in October 1996 were chosen for the project.

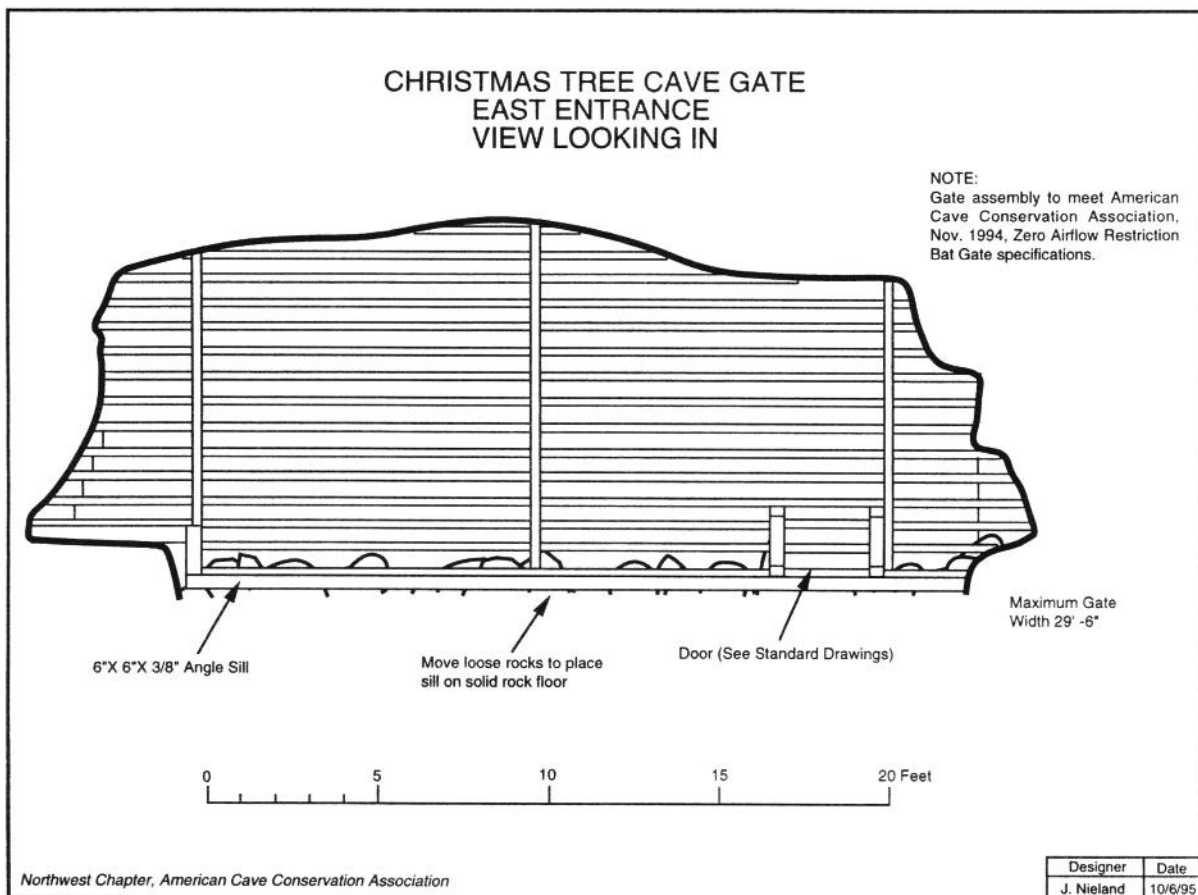
Another concern was air movement through the cave. In warm weather the lower entrance exhales, in cold weather airflow reverses with the upper entrance exhaling. If we constructed the gate during the wrong period, welding fumes could be drawn into the cave. We decided to build the downslope gate first while that

entrance was exhaling, then move to the upper entrance in hopes that airflow would reverse and blow fumes out of the cave there as well. As luck would have it, there was an airflow reversal early into construction of the upper gate, so 90% or more of the fumes were blown out of the cave. Everyone was extremely pleased with the outcome!

### We All Have a Stake

Northwest cavers have a large stake in making sure that Townsend's big-eared bats are protected. The US Fish and Wildlife Service has already listed the eastern subspecies as threatened, while the western subspecies (Townsend's) is under consideration. If they ever list the species, that could result in severe restrictions on cave access throughout its range. Area cavers understand this and the importance of protecting bat habitat, if they hope to maintain access to other caves in the future.

Now that the cave has been gated, The Nature Conservancy of Washington, in cooperation with the Washington Department of Fish and Wildlife, is preparing a long-term management and monitoring plan. They will continue to monitor the maternity colony use by making exit counts with night vision equipment, and hibernation counts once every two to three winters.



## Mount St. Helens Cave Use Study

This winter will mark the beginning of a study to determine the success of seasonal bat closure at selected caves in Mount St. Helens National Volcanic Monument. Visitor use will be counted at several critical caves using electronic sensors.

## Bat Disturbance Detectors Developed

On a related topic, Paul and Katrina Ostby have developed a prototype bat-roost-disturbance detector. The detector is very sensitive, detecting low levels of reflected light. The device is tiny, fitting into the palm of your hand, and easy to hide in a cave. When triggered, the device records the date and time on a computer chip. In the spring they will remove the device from the cave, and they will download the data into a computer for analysis. Paul and Katrina hope to do further testing within the next year, and perhaps in the future offer the device for sale to cave managers.

Scott Linn and Larry King are developing a similar device for members to count visitors in Central Oregon caves. Larry has been involved in a multi-year project of monitoring the impact of climbing in cave entrances. They will use the device to determine actual use levels at various sites.

## Climbers Cited for Using Chalk

In the last issue of *American Caves* we reported problems caused by climbers in caves of the Deschutes National Forest. The Forest's efforts to remove climbing chalk from Skeleton Cave in May and on August 10 proved unsuccessful. Workers used a pressure washer and 200 gallons of water in the most recent attempt. Chalk had become more or less permanently embedded in the porous basalt surface, and still remained after the cleanup. A complete ban on climbing chalk in Deschutes caves followed shortly thereafter. Rangers posted signs in the caves, and are now ticketing violators. The fine is reported to be \$200.

## Recreational Impact to Rock Art Evaluated

Greg Bettis, a noted Northwest rock art expert, recently completed a thorough inventory and evaluation at Hidden Forest Cave. The evaluation included mapping of the cave and rock art, and photography to record the condition of the rock art and cave. The report noted visitor impacts such as trampled vegetation, unauthorized excavation of holes (the

cave is an archaeological site), scratched graffiti, chalk graffiti art, climbing chalk on and near the rock art, and permanently placed bolt anchors in and around the cave entrance. Belaying platforms had been constructed by moving rocks to form small terraces. The report recommends that "...the activities occurring at the Hidden Forest Cave site over the past several years need to be addressed and eliminated immediately." The report also cautions about conservation and restoration activities that could cause additional damage to the rock art, and suggests that someone familiar with rock art conservation be consulted before any attempt is made to remove chalk. The use of climbing chalk at this and other area caves has been prohibited by the Forest Service as noted above.

## Skeleton Fire Impacts Arnold System

August's Skeleton Fire in Deschutes County left the area inside cave entrances intact, but the surrounding land is now being described as a "moonscape." All caves north of China Hat road were affected, including Boyd, Skeleton, Wind, Pictograph, Bat, Deg, and Charlie-The-Cave. Bat counts remain stable, although there is some concern about habitat and the fire's short term effect on food resources.

Impact evaluations are under way, with long and short-term road closures being discussed. Typically after a range fire, they close secondary roads through one "greening cycle" to prevent introduction of nonnative weed species. In addition, off-road vehicle use becomes difficult to control in the sand dunes remaining after an unusually hot fire of this type.

## BLM Selling Caves

The U.S. Bureau of Land Management (BLM) will sell some land that contains five caves that were nominated as significant. The caves are part of the **Horse Lava Tube System** near Bend, Oregon. Garry Petrie has created a new WWW (World Wide Web) page on this subject at <http://www.europa.com/~gp/blm.htm>. Garry quotes BLM's environmental assessment: "The caves would be afforded no federal protection. Restrictions which apply to significant and potentially significant caves under interim management policy would no longer be enforceable...Due to increasing urban development and the associated increasing human disturbance levels, impacts to roosting big-eared bats would continue on the parcel...further degradation of the site or loss of habitat to development could potentially affect the local population...the health and sustainability of the local population has already been compromised." The BLM was asking for public comments through December 23, 1996. Write to: Teal Purrington,

District Environmental Coordinator, Bureau of Land Management, Prineville District Office, P.O. Box 550 (3050 N.E. 3rd Street), Prineville Oregon 97754. (Source: *Cavers' Digest*, November 12, 1996.)

## Below America

### Butler Cave Conservation Society (BCCS)

The BCCS owns the entrances to two of the larger cave systems in Virginia (Butler Cave Sinking Creek System and the Bobcat System) and a few smaller ones. Recently the BCCS was asked to administer two other significant cave systems that are privately owned. Mike Artz, chairman of a new committee formed to formulate guidelines and policies for BCCS and nonBCCS caves, is interested in hearing about policies and guidelines covering the issues of liability, access, exploration, safety, scientific study, etc. Any information would be appreciated. Please respond to [mikeartz@shentel.net](mailto:mikeartz@shentel.net) or 540-459-8526. (Source: *Cavers' Digest*, November 7, 1996.)

### Ohio Karst Not for Nuclear Waste

On September 18, the Ohio Low Level Nuclear Waste Storage Facility Development Authority had a workshop on karst and limestone geology, to assist them in understanding what karst is, and why those landscapes are not particularly suited for nuclear waste storage. The state law that directs the siting process expressly directs the group to avoid karst. Source: "Chris Groves" <[Chris.Groves@wku.edu](mailto:Chris.Groves@wku.edu)>, in *Cavers' Digest* No. 5368, September 19, 1996

### Barton Springs Salamander Follow-up

In the last issue of *American Caves* we published "The Barton Springs Salamander." It was not clear at that time if the U.S. Secretary of the Interior, Bruce Babbitt, would allow the U.S. Fish & Wildlife Service (USFWS) to place the Texas salamander on the endangered species list. In August, Babbitt decided not to list the species, against the scientific recommendations of the USFWS. Instead, he made a deal with the State of Texas to let the State make water-quality regulations to protect the amphibian. In October Babbitt was sued by the Save Our Springs Alliance and a University of Texas scientist for not following the scientific evidence. In November the head of the USFWS, John Rogers, warned the State that it should promptly adopt protections for the salamander or it could be listed after all. The protections brought by the listing would be better than existing City of Austin rules or proposed state rules. As of

December the case was still in court. The salamander is a "barometer" of water quality for a karst aquifer that supplies not just Barton Springs, the fourth largest spring in Texas, but well water to 35,000 people. On December 4 the Texas Natural Resource Conservation Commission adopted stricter rules for the portion of the Edwards Aquifer that supplies water to Barton Springs. On December 7, twelve dead salamanders were found in one of the three springs, a significant die-off for the small population. Biologists are investigating. Many experts consider this the most endangered vertebrate species in America. (Source: *Austin American-Statesman*, October 30, November 20, December, 5 & 11, 1996.)

### Maple Run Cave Vandalized

In July, The City of Austin, Texas, reported that its Maple Run Cave was vandalized. However, the cave had not been gated even though funds for a gate had been requested by



*Restoration of a stalactite with epoxy, fulcrum, and lever. Philip Farrington in Cave Without A Name, Texas. Photo by George Veni.*

titled "Austin's Most Visited Caves," and published by the Department, prematurely gave location maps to some of the city-owned caves, even though some were not gated and several of them contain rare species protected under the regional **Balcones Canyonlands Preserve** system. The booklet was withdrawn after Bill Elliott raised an objection. Maple Run Cave finally was gated. Biologists from the City of Austin and Travis County, and local cavers are discussing ways to manage caves owned by the City and various private landowners in the area. (Source: *Austin-American Statesman*, July 30, p. B1, B5; August 5, Letters to the Editor.)

## Caverns of Sonora Restoration

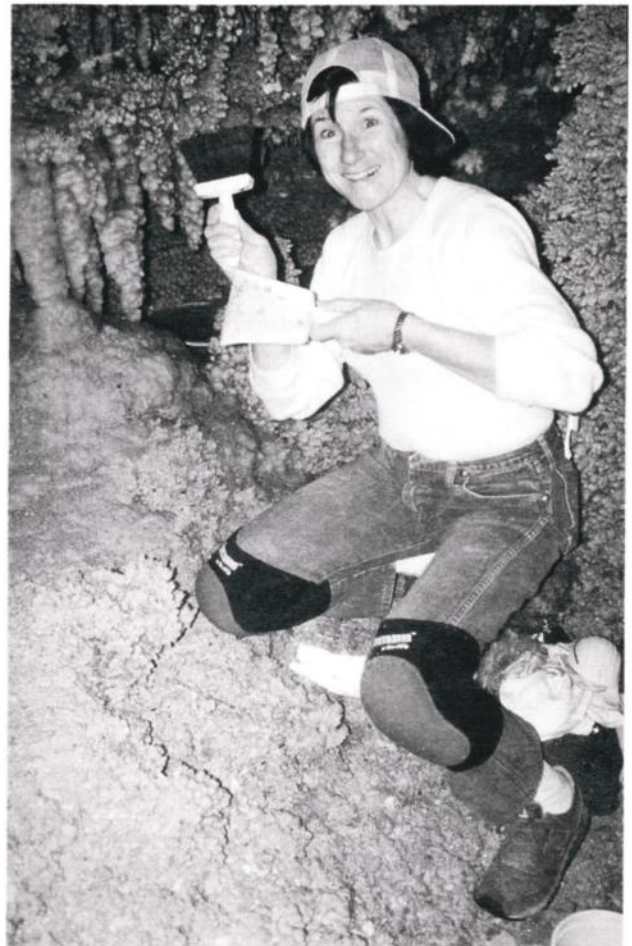
On November 3, 65 cavers met at the most beautiful show cave known to assist in the ongoing restoration project started by Dr. George Veni in 1991. This annual event attracts so many volunteers that George has to keep a waiting list for the overflow! The cavers removed 890 buckets of loose rocks and sand (about 18 tons), which they dug up from areas that were covered when the cave trail was built in the 1960s. The labor was efficiently organized, utilizing a rotation system in which most got to do all the jobs. Hand trucks were used to move buckets along trails, and bucket brigades passed the material up stairways to a dump truck outside. The cave, always beautiful, is taking on a more natural appearance as holey areas near the trail re-emerge. The cavern management worked alongside the cavers, and treated them to breakfast, lunch, and a delicious barbeque dinner that evening! George, an ACCA member, led a special geology/photography tour the next morning for the cavers. Bill Elliott, your editor of *American Caves*, handed out free copies of this magazine, and asked cavers to join ACCA!

## New Web Site on Texas Caves

The Texas Speleological Survey recently published its site on the World Wide Web, with extensive scientific and educational material, color photos (especially Caverns of Sonora), and maps of Texas caves and karst. Your editor created the site. Check it out at <http://www.utexas.edu/depts/tnhc/www/tss>

## Carlsbad Management Plan Published

The 287-page "Final General Management Plan/Environmental Impact Statement" for Carlsbad Caverns National Park was published recently, and is available on request from Carlsbad Caverns National Park, 3225 National Parks Highway, Carlsbad, New Mexico 88220;



*Joann Deluna cleans up Caverns of Sonora.*

telephone (505) 785-2232, ext. 321. **This is an important document for show cave managers to study.** A draft of the plan was extensively reviewed by experts and the public in 1995-96, and 29 comments were received and considered. The plan presents three alternatives for future management of the park. **Alternative 1** would continue the existing management direction at the park, which is to provide for visitor use and respond to resource management issues as funding allows, but there would be no major change. However, the **cavern lunchroom would be removed in any event**, because NPS has determined that the lunchroom, started in the 1920s, no longer can be justified. In the old days visitors spent eight to ten hours in the cave; now they spend one to three hours, and they are never far from the elevators. Having a cavern lunchroom is not in keeping with the NPS philosophy of protecting and highlighting the cavern's special character, and it is often the first and last view seen by cavern visitors. The lunchroom has negative impacts on the cave environment, including food and trash thrown off the trail and into pools, and changes in the cave's ecology. **Alternative 2**, which is the one proposed,

on scientific research, inventory, and monitoring. Data would be gathered about how humans and facilities are affecting resources. **Ogle Cave** would be studied for possible guided tours. Changes might include infrastructure improvements and even the removal of certain facilities above Carlsbad Caverns to avoid infiltration of polluted water. Two major sewer leaks and many ongoing leaks have seeped into the cavern. Special off-trail tours would be offered, the visitor center would be remodeled for more efficiency, and a ranger residence would be provided near Slaughter Canyon. **Alternative 3** would remove many surface functions and facilities above the cavern within five years. A new transit center and NPS operations center would be built at the base of the escarpment, and visitors would use a shuttle system to reach the visitor center. Visitor use of the cavern would be monitored and restricted to minimize further damage, and no special off-trail tours would be provided. Alternatives 2 and 3 are favored under the environmental impact statement. This plan points the way to wise management of public caves.

## Nevada Cave Looter Sued by BLM

An Oregon man convicted of taking ancient Indian remains from a cave in Nevada's Black Rock Desert faces a civil penalty of more than \$2.5 million, the federal Bureau of Land Management says.

Jack Harelson of Grants Pass faces the penalty in addition to 18 months in jail and \$20,000 in fines and restitution ordered by an Oregon circuit judge. Harelson has appealed that sentence.

"The Nevada BLM wants to send a strong message that archaeological looting will not be tolerated," said state BLM Director Ann Morgan.

Harelson, 55, an insurance agent, was convicted last January of looting the graves he found while excavating a cave located on federal land in the Black Rock Desert in the early 1980s.

According to testimony, an investigation began when Harelson had a falling out with partners in an opal mine in Nevada and they informed authorities he had excavated artifacts from the cave.

The tip led investigators to Pam Ralph, Harelson's ex-wife, who testified and provided photographs of the dig in return for immunity from prosecution.

The remains of two Indian children unearched from the cave were ordered returned to members of the Pyramid Lake Paiute Tribe—but their skulls were missing.

Harelson maintained he doesn't know what happened to the skulls since he unearched the complete remains, stripped them of funeral objects, and reburied them whole in his garden. (Source: *The Daily News*, Longview, Washington, April 20, 1996.)

## From the National Speleological Society

Thanks to Rob Stitt for permission to reprint news condensed from the NSS Conservation and Management Section web site: <http://www.halcyon.com.samara/nsscems/welcome.html>. The December *NSS News* (page 336) mentioned Dr. Julian Lewis' article on the "Nitric Acid Caves of the Indiana Army Ammunition Plant," which appeared in *American Caves* last time.

## Indiana Caves Cleaned and Restored

The December *NSS News* noted the Central Indiana Grotto's work at Mammoth Cave and ACCA. The grotto also has been restoring **Muscatatuck Caverns** and **Marengo Caverns** in Indiana. Good work folks!

## Lead Prospecting in Missouri Karst

In June, the **Missouri Conservation Commission (MHC)** granted permission to the **Doe Run Company**, a lead mining firm, to test drill for lead on 7,080 acres of state forest land. The test sites bordered the Ozark National Scenic Riverways. The sites could threaten the recharge of **Round Spring** and **Blue Spring**. Blue Spring was the site of groundwater contamination by the Ozark Lead Company in 1977. Some of the area proposed was initially purchased by **The Nature Conservancy**, then resold to the MDC for management on account of its pristine nature, and rare species. The Sierra Club, Coalition for the Environment, Missouri Conservation Federation, the State Attorney General, and citizens objected to the permit. On August 16, the MHC decided not to allow the permit.

Doe Run Company also applied to the **U.S. Bureau of Land Management (BLM)** for five prospecting permits on the **Mark Twain National Forest** about 35 miles south of the Round Spring sites. This area is very karstic and cave-filled. This would encompass 7,970 acres directly south of Winona, and within one mile of the Eleven Point National Scenic River. The area in question furnishes recharge for **Big Spring** (administered by the **National Park Service**) and **Greer Spring** (administered by the **U.S. Forest Service, or USFS**), the two largest springs in Missouri.

USFS prepared a draft Environmental Analysis with four concerns: water quality issues; surface disturbance issues; impact of drilling on aesthetics/recreation; and monitoring of drilling operations. The major threat seems to be to groundwater resources, and interstitial cave fauna. Even though the official comment period has closed, any letters should be directed to **Jody Eberly, Doniphan/Eleven Point Ranger District, Rt. 1 Box 1908, Winona, MO 65588, phone: 573-325-4233, Fax: 573-325-4325.**

## Speleothem Sales

As of July 10, 1996, the National Park Service (NPS) has returned, and is refusing to sell, any rock and mineral guides that show pictures of broken (collected) speleothems. Dave Jagnow, NSS Conservation Chair, is writing publishers of these guides 1) encouraging photographs of the speleothems on the cave wall, not broken off, and 2) including a strong cave conservation message that speleothems should not be removed from caves.

## Pictograph Cave, Oregon

Jagnow wrote a letter in August in support of BLM interim measures to increase protection of Pictograph Cave (Stout Cave). The BLM has closed the road leading to the cave, so it now requires a quarter-mile hike. The formulation of management alternatives will begin this fall with a public meeting before publication of the Draft Management Plan. The rock-climbing access vs. cave protection issue is being actively debated with the cavers and Access Fund people.

## BLM/Yates Energy Settlement

Yates Energy was paid \$2.2 million by BLM in a settlement, and they drilled their Diamondback Federal #1 well just northwest of Lechuguilla Cave. The well was a dry hole, and it was plugged and abandoned on August, 13, 1996. This probably will end the threat of oil and gas exploration close to Lechuguilla Cave.

## National/Regional Cave Specialists

Dave Jagnow has been pursuing the establishment of national and/or regional cave specialists within the BLM and USFS. He is not promoting specific names, but only the need for the positions. He is also encouraging these two federal agencies to recognize caves as significant nonrenewable resources, rather than as recreational resources. He is also encouraging the Texas Parks and Wildlife Department (which owns at least 408 caves) to employ a cave specialist.

# Beyond America

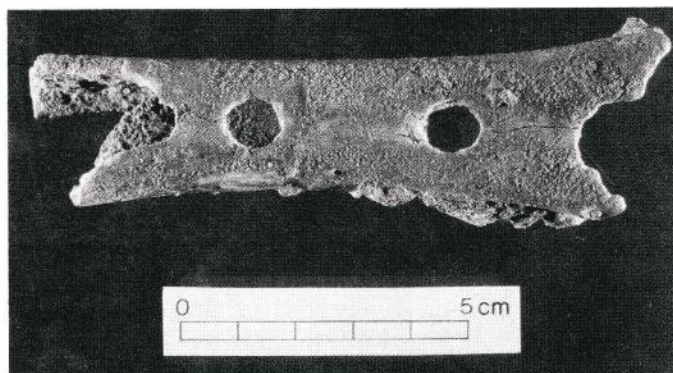
## Endangered Caves in Argentina

The Cuchillo Cura System in Argentina is endangered because marble mining has started again in the area. The System, located in the Provincia del Neuquén near Las Lajas city, has been researched by Argentine and foreign

scientists, who have discovered the first known troglolithic (cave-adapted) fauna in Argentina. The archaeology, hydrology, and climatology of the caves also have been studied by the Grupo Espeleológico Argentino since 1982. To help defend this ecosystem, please request more information from: **Grupo Espeleológico Argentino**, Estudio y Conservación de Cavidades Naturales y Artificiales, Correspondencia: Casilla de Correo 232, Sucursal 3, 1403 Buenos Aires, Argentina. Headquarters: Heredia 426, Buenos Aires, Argentina, Tel: 54-1-552-1716 / 0981, Fax 54-1-3425437 /3348964 E-Mail:gea@arg.siscotel.com

## The World's Oldest Musical Instrument?

A possible 45,000-year-old Neandertal flute has been found in a Slovenian cave in the former Yugoslavia. The palaeolithic cave site, **Divje Babe I** (= "Wild Women") has been excavated since 1980. The cave was well-known to the local people as a source of fertilizer made of ancient, disintegrated bear bones. Last year, Ivan Turk and Janez Dirjec excavated in **femur of a young cave bear** with four artificial holes on the posterior side: two of them complete and two partially preserved (see photo). Radiocarbon dating of bear bones yielded a date of 45,100 +1,500 -1,800 years B.P. (before present). Both tips of the bone are broken and the fracture later smoothed, a feature characteristic of most bone fragments found in the cave. It must be first proved that the holes are manmade, and in this particular case it would probably be Neandertals who were responsible. (Neandertals are an extinct group of humans who inhabited ice-age Europe and Asia Minor.) The holes might have been made by a large carnivore, but traces of teeth on the bone have not been seen. A more detailed report on this interesting find will be published in a scientific journal. (Source: Dr.Ivan Turk, Inštitut Za Arheologijo, Ljubljana, Slovenia.)



*Photo of Neandertal bone flute by Marko Zaplatil, Zrc Sazu, Ljubljana, Slovenia.*

# ACCA Gift Shop Items

**ACCA T-Shirts:** Light blue shirt with ACCA logo in dark blue. Available only in size Large #*ACCAT*  
Price: \$10.00 (non-member)/\$9.00 (member)

**ACCA Patches:** ACCA logo in blue and green on a tan background #*ACCAP*  
Price: \$3.00 (non-member)/\$2.70 (member)

**ACCA Pins:** ACCA logo in blue and green on a gold background #*PIN*  
Price: \$2.50 (non-member)/\$2.25 (member)

**ACCA Window Decals:** ACCA logo in blue on a white background #*DECAL*  
Price: \$1.25 (non-member)/\$1.12 (member)

**Karst Center Patches:** American Cave & Karst Center logo in blue and green on a tan background #*KCP*  
Price: \$3.00 (non-member)/\$2.70 (member)

**American Cave Museum T-Shirts:** dark blue and teal shirts. Available in sizes Med., Large, XL, XXL #*ACMT*  
Price: \$15.75 (non-member)/\$14.17 (member)

**Hidden River Cave T-Shirts:** oatmeal colored shirts with blue or purple trim featuring historic photo. Available in sizes Med., Large, XL, XXL #*HRCT*  
Price: \$17.50 (non-member)/\$15.75 (member)

**Conserve Underground America T-Shirts:** forest green shirt with a cave cricket. Available in sizes Med.; Large; XL, XXL #*CONSERVT*  
Price: 15.95 (non-member)/\$14.35 (member)

**Salamander T-Shirts:** white with small cave salamander on front and large salamander on back. Available in sizes Small; Med.; Large; XL #*SALT*  
Price: \$15.95 (non-member)/\$14.35 (member)

**1995 National Cave Management Symposium Proceedings** (318 pp.) Articles relating to resource management of caves and karstlands published by the Indiana Karst Conservancy, Inc. #*NCMS-95*  
Price: \$15.00 (non-member)/\$13.50 (member)

**1991 National Cave Management Symposium Proceedings** (405 pp.) Articles relating to resource management of caves and karstlands published by the ACCA. #*NCMS-91*  
Price: \$27.50 (non-member)/\$24.75 (member)

**1982 National Cave Management Symposium Proceedings** (119 pp.) Articles on cave management, resources and cave history as published by the ACCA. #*NCMS-82*  
Price: \$4.95 (member)/\$4.45

## ORDERING INFORMATION:

Please include item number, description, price, shipping address and a daytime telephone number. Checks should be payable to: ACCA, P.O. Box 409, Horse Cave, Kentucky 42749. Kentucky residents please add 6% sales tax.

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Please feel free to write or telephone (502) 786-1466 for our complete listing of books available on nature, caves, bats and rocks and minerals. Gift shop purchases help support the American Cave Museum and the American Cave Conservation Association's educational programs.

## ACCA Wish List

The following items are needed for the ACCA office and the American Cave Museum. Donated items are tax-deductible, and the funds saved can be used to support cave conservation.

- Electric Headlamps (any brand)
- Letter Size File Cabinets
- Map Drawers
- Microscope and binoculars for educational programs
- Time Clock

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