

Utah Caver Annual 2006

Saving Nutty Putty Cave

Restoration of Bloomington Cave

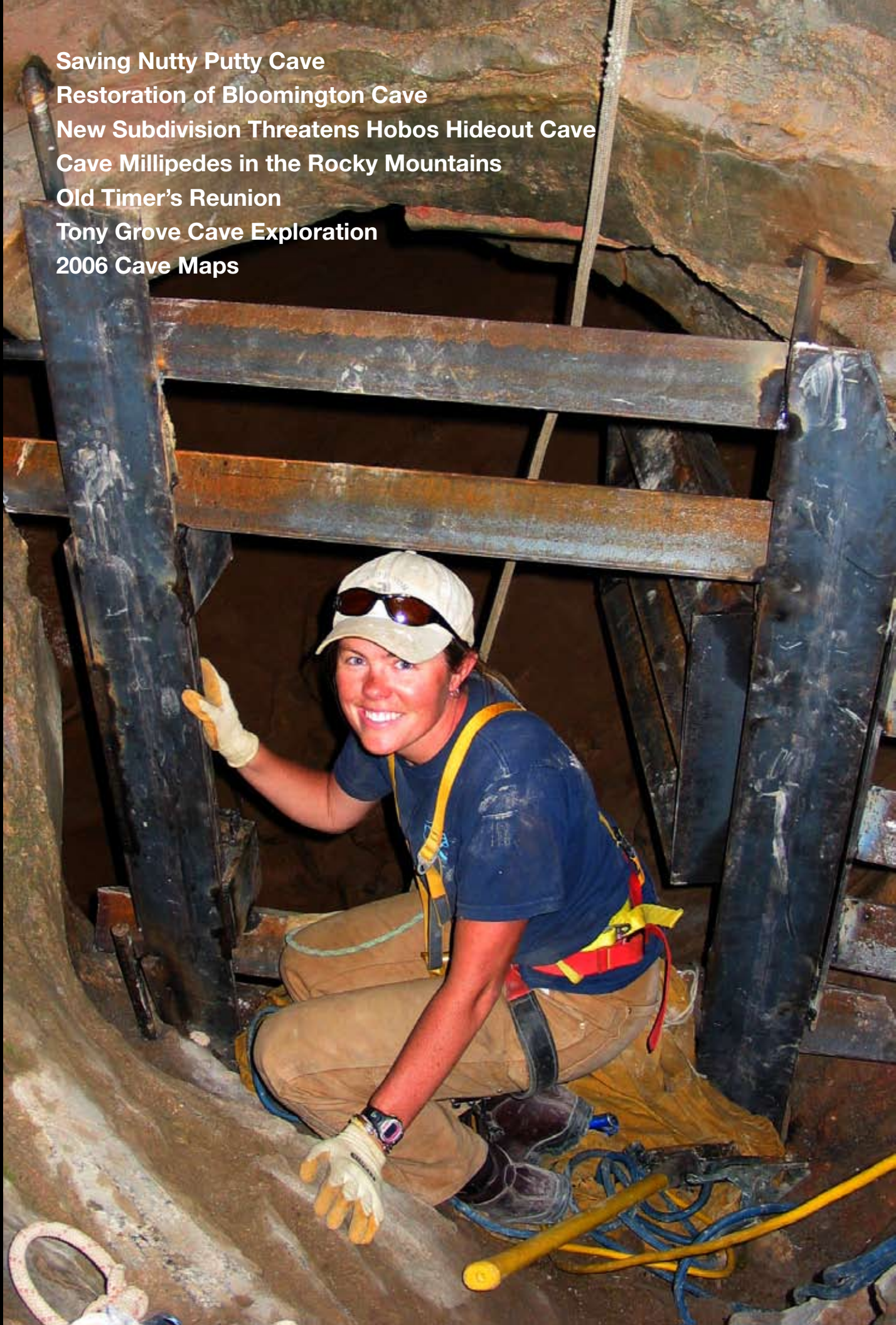
New Subdivision Threatens Hobos Hideout Cave

Cave Millipedes in the Rocky Mountains

Old Timer's Reunion

Tony Grove Cave Exploration

2006 Cave Maps



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**Cover Photo: Cami Pulham helping to complete the
Blowhole Cave gate. *Photo by Jon Jasper***

Utah Grottos of the National Speleological Society



The Utah Grottos are local chapters representing the National Speleological Society (NSS) in its mission “...to promote interest in and to advance in any and all ways the study and science of Speleology, to promote the protection of caves and their natural contents, and to promote fellowship among those interested therein.”

Timpanogos Grotto www.caves.org/grotto/timpgrotto/

Meetings are the second Tuesday of each month at 7:00 pm at Hansen Mountaineering (1799 N. State St. Orem).

Wasatch Grotto www.caves.org/grotto/wasatch/

Meetings are the second Monday of each month at 7:00 pm at the Bountiful Davis Arts Center (754 S. Main St. Bountiful).

Salt Lake Grotto www.caves.org/grotto/sl-grotto/

Due to lack of attendance, the Salt Lake Grotto is temporarily meeting with the Wasatch Grotto. Check website for updates.

Contents

Saving Nutty Putty Cave	1
Restoration of Bloomington Cave	8
New Subdivision threatens Hobos Hideout Cave . .	10
Cave Millipedes in the Rocky Mountains	11
Old Timer's Reunion	13
In the Dark.	17
Exploring the Deep Caves of Tony Grove	18
Geology of Logan Canyon and Tony Grove	20
Charting Tony Grove's Weather	21
Cave Map Index	23
Caving Geology of Logan Canyon, Utah	
Baker Creek Cave System	
Systems Key Cave	
Little Muddy Cave	
Snake Creek Cave	

Saving Nutty Putty Cave

Jon Jasper

Summary

In the spring of 2006, Nutty Putty, Blowhole, Rabbit Trap, and Silly Putty Caves were gated under a Management Agreement between the Timpanogos Grotto and the Utah State Institutional Trust Lands Administration (SITLA). Ironically, these caves were gated to ensure their long-term access. Safety concerns have been exponentially growing. With the most recent chain of rescues, SITLA began considering serious alternatives, including a permanent closure of the caves.

As an alternative, a lease agreement was pursued led by BYU's Recreation Department; however, it was permanently dropped when the four drownings in BYU's closest cave, Gollums Cave, made national news. The Timpanogos Grotto didn't have the million-dollar liability insurance policy required to pursue a lease agreement; however, after showing continuous concern, SITLA presented the option of a Management Agreement where the Timpanogos Grotto could voluntarily manage the cave for the state under mutually agreed guidelines. Thus, Timpanogos Grotto gated and is now managing SITLA's caves.

Now that the caves are gated and being managed by Timpanogos Grotto, the "real" test begins. Will the caves' management be accepted? Can the caves truly be saved? Many cavers believe "saving Nutty Putty Cave" is an impossible task. This concept is ultimately being put to the test through the installation of a cave gate and the implementation of a permitting system. The new access requirements are slowly being accepted and most of the safety and conservation problems have been eliminated.

Problems begin

Nutty Putty Cave was first entered on April 19, 1961 after a rancher told Utah caving pioneer, Dale Green, about a blowing hole on the top of the hill. The cave was a simple dig involving minimal moving of rocks to gain access.

Several months later, Dale Green took a BYU professor to the cave. The professor started

leading his own trips to the cave, and it quickly gained popularity for its proximity to Provo and its sporty labyrinth of small crawls and climbs.

The cave continued to grow in popularity. In the mid-1990s, the first rescue occurred in the cave. This rescue involved a young scout who crawled into an extremely tight passage and then lured his bigger friend to follow. The passage, now referred to as "the scout trap," involves several body-tight bends to reach. After the turns, the passage plunges into a funneling hole where the scout was trapped for 12 hours. The last 90 degree bend made it nearly impossible to assist the scout. In the end, a caver verbally coaxed the scout out from the hole.

In 2001, the same situation occurred. One small scout leading a larger into the same "scout trap." The scouts were stuck in the cave for about four hours before an experienced caver was able to calmly coax the scout out of his trap.



Typical visitors to Nutty Putty Cave *Jon Jasper*

During this rescue, the scout leader never entered the cave. He took 12 year old scouts to the cave and let them explore the cave as he waited at the entrance. Even as a caver emerged to initiate the rescue using his cell phone and the SAR teams gathered, the scout leader never entered the cave.

Nutty Putty Cave was quickly becoming the place in Utah to learn all the wrong caving techniques. Helmets were rarely seen. The cave often carried an odor of a sweaty gym, and on the weekends, lines existed to get in and out, making a very unreasonable escape for the emergency bathroom runs. The cave's bedrock-lined tunnels were becoming polished from the high-use. The resulting slippery surfaces made the climbs, like the Big Slide, a waiting disaster.

Making an effort

Most of the grotto cavers labeled Nutty Putty Cave as "a lost cause" - a cave that they never go to again. In a resistant effort, I started to research and document the problem hoping some day to be able to apply a reasonable solution. I began a cave visitation studies and restoration efforts.

To establish the amount of visitation and identify the use groups, a cave register, constructed of four-inch ABS sealed pipe, was placed within the first room of the cave. This register recorded 1,711 visitors over 8 months or an average of 7 people/day.

This register had many difficulties. The location of the register was just inside the cave where the passages first starts opening up. Even though groups often bottle-neck here, it wasn't a good location for most folks to stop and sign a register. Due to the cave's high humidity, the paper within the register had to be changed about once a month or else it would turn into an unreadable mush.

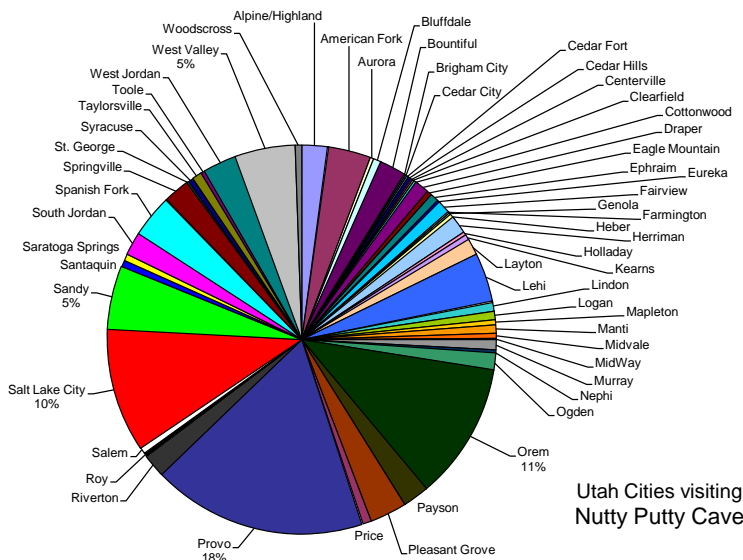
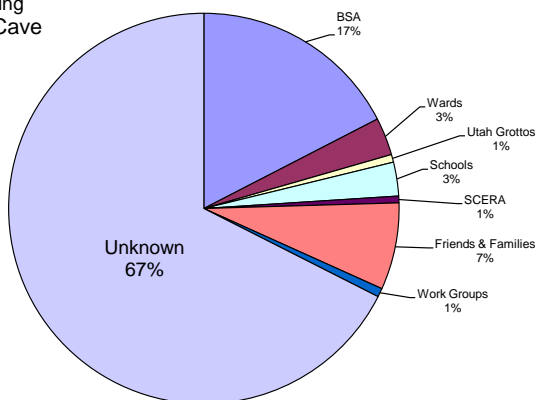
In an effort to get higher quality visitation data, light sensing dataloggers were implemented. The first attempt was placing a small HOBO light event logger into the top of the in-cave register to compare the two techniques. With the logger compartmentalized in the top of the register, a small flashing LED could be seen in total darkness. The humidity also erased any markings identifying it as a register. Within a few weeks of being placed, a "pipe-bomb" was reported. The Utah County Sheriff's office responded, prepared to destroy the threat. The response crews were called off after a call to caver Spencer Christian who explained that their bomb was actually a harmless cave register. Not getting a good seal to protect it from the high humidity, the logger failed. Other methods were implemented to col-

lect good visitation demographics and accurate visitation times.

In October 2003, a register was installed on the surface near the entrance to record visitation and to distribute educational materials (cave conservation, safety, & maps). The objective of the register was to establish group demographics (who & where) of the cave's use. The hope was that this data would be used to forge a positive solution for the future for Nutty Putty Cave by teaming together the interest groups.

Demographic data were collected from 1,251 visitors from the surface register from October 2003 to August 2004. The results show that the highest visitation group visiting Nutty Putty Cave was the Boy Scouts of America (17%). All of the Utah Grottos accounted for only 1% of the total visitation. Location demographics show that the top visiting cities are: Provo (18%), Orem (11%),

Groups visiting Nutty Putty Cave



and Salt Lake City (10%). Out-of-state visits made up 8% and out-of-country visits make up 2% of the total visitation.

Another light recording datalogger was tried. This time it was a HOBO Stowaway light intensity datalogger. The purpose of the Stowaway was to study visitation trends. It recorded the maximum light intensity passing by it every 15 minutes. The results showed that the cave is occupied 13.8% of the total time and estimates 4,909 visits/year. This result was a huge difference when compared to the cave register's estimate of 2,528 people/year.

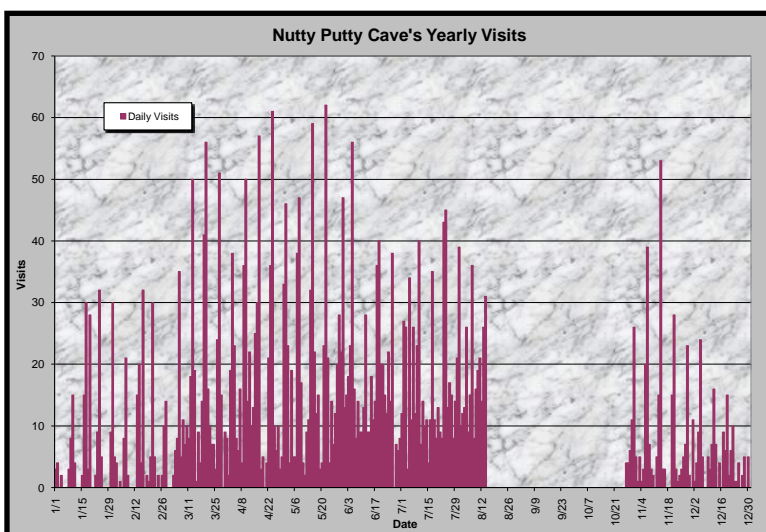
The interesting question raised was, "What are Utahns doing visiting the cave as late as 4:00 am?" Since most of this night activity was collected in the winter, any hour may be possible for the summer!

The hope was to get visitation statistics for one full year with the Stowaway light intensity datalogger; however, after 9 months, it was stolen. The surface register received many problems due to winds blowing out pages after visitors left the top open.

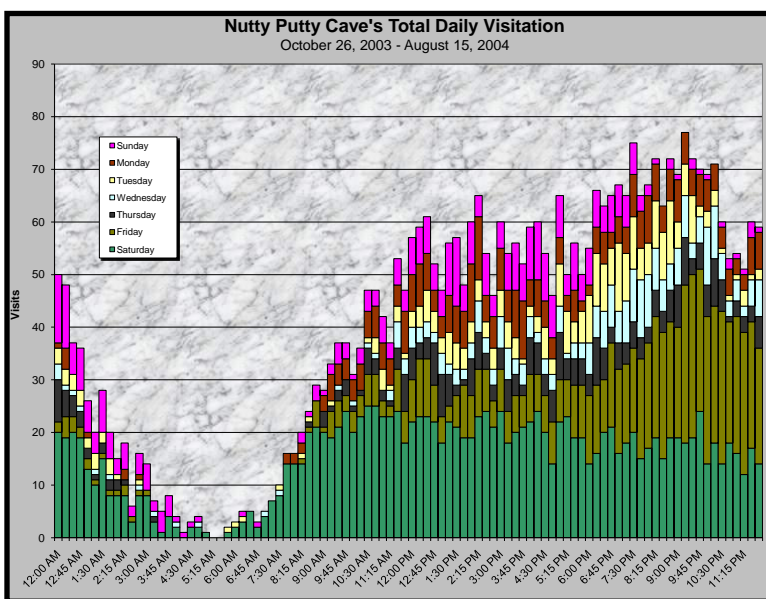
As I was studying the visitation, I was also trying to keep a fixed rope in good condition on the Great Slide. Over the years, visitation has nicely worn down the bedrock into an extremely slippery polished limestone. A rope handline definitely became needed. First, I replaced existing ropes with my old ropes by simply tightening the rope around natural anchors. The unblemished rock climbing rope lasted about two months before completely fraying through the outer sheath anywhere it touched rock. I then placed a caving rope. It lasted for about four months before I discovered someone put a huge knot where the rope was slightly slapping the rock within the middle of the line. I then placed bolts to keep the rope completely off of the rock. It lasted about one year before the knots placed to grip for climbing were mostly worn through.

On one trip, I noticed problems with the rope fraying. I decided to take the rope out of the cave. Just as I was finishing derigging the rope, I heard a small group of visitors approaching. To avoid the odd questions of why I was removing the rope, I hid the rope by sitting on it as the group passed. They were instantly concerned that the rope was missing. I heard them complaining and struggling with the drop. I decided to replace the rope with a newer caving rope I happened to have in my car.

I quickly returned with the new rope and was laying it out when another group came upon me. I explained to them how I had the rope lying out to make sure it would be long enough. The rope was just lightly wrapped around and not tied to the pillar in the middle of the slide. I gave them the option of either waiting for me to finish or to continue without the use of the rope. As I came down the passage, the group was indeed using the rope. The last one to climb looked at me and asked me



Daily visitation from 2003 to 2004 Jon Jasper



Visitation broken out in 15 minute intervals Jon Jasper

“it is okay?” I could hear the group insisting for her to use the rope. I was very amazed how much the rope had become needed. I concluded if the rope was removed, probably within a day to a week, a serious accident would occur.

Introductions to State Trust Lands (SITLA)

Looking for projects for his Young Mens Group, Spencer Christian arranged a meeting with SITLA to discuss constructing an educational kiosk at the cave’s entrance. The kiosk was to have information on safe caving, cave conservation practices, and an informative map of the cave. The kiosk never came to be; however, the meeting was the start of discussions with the state about the growing safety problems.

Our SILTA representative explained that the Utah Trust Lands, where Nutty Putty Cave resides, are to be managed “in the most prudent and profitable manner possible, and not for any purpose inconsistent with the best interest of the trust beneficiaries. The beneficiaries do not include other governmental institutions or agencies, the public at large, or the general welfare of the state.” In the simplest of terms, Utah Trust Lands are managed to maximize profits for the Utah school system. They do not manage caves.

The state was willing to work with interested parties improved safety and resource protection. Under the state’s supervision, these interested parties could implement sound management practices that will promote cave safety and resource protection without cost, increased liability, or negative press for the state.

About 10 years prior, the state actually came to the Utah Grottos seeking assistance on how to manage Nutty Putty Cave. In a Utah Grottos’ meeting, the grotto representatives voted not to help. They concluded the situation was too large and complex to handle.

At this meeting, I introduced how Kyle Voyles and I predicted the fatality that recently occurred at Bloomington Cave and led into how a fatality would occur with a bad fall off of the end of the Great Slide in Nutty Putty Cave. Stories existed where a visitor had fallen off the slope and broken his leg. He was left behind as the group continued. They returned and assisted him on the way

out. On another trip, a visitor actually took the head fall that I predicted would create a fatality. He amazingly exited with some assistance from friends and was taken to the hospital where he was treated for a serious concussion. Our ideas were seeded; the wait began for another event to create the change.

Nutty Putty Cave’s safety problems were noticeably increasing, if left unchecked would result in a fatality forcing the complete closure of the cave. This conclusion became overly apparent when two full callout rescues occurred near Labor Day Weekend 2004.



Mock rescue for TV coverage Jon Jasper

The catalyst for change

Nutty Putty Cave has had only four complete callout rescues. Amazingly, two of the four occurred on back-to-back weekends. All of the rescues involved people being stuck. All had exited on their own without being strapped to a rescue litter and none needed any medical treatment. These rescues were more comical than life-threatening.

The first two rescues involved boy scouts (about 12 years of age) getting stuck in the same spot in the cave. The spot is now referred to as the “Scout Eater.” On the second rescue, the scout leader never entered the cave even as a full rescue unfolded before him. With the 90 degree bend at the Scout Eater, rescuers couldn’t help pull the scouts out. They were only able to coax the scouts out. They concluded once the scouts relaxed their tightened muscles, they were able to escape on their own. At the rescue debriefing, they discussed using drugs to facilitate the relaxed state for a quick rescue.

The other two rescues involved older college-age teens both trapped in the Maze Section. The rescuer used rock chisels to free them. The “real” hazardous situation of folks sliding off the Great Slide receiving broken bones or serious concussions never created any media coverage.

In the fall 2004, about a month after the rescues, the Utah County Sheriff’s Office contacted SITLA to look into possible actions to prevent future callouts. SITLA contacted the cave’s known user groups. Timpanogos Grotto (Jon Jasper, Spencer Christian, Brandon Kowallis, and Chuck Acklin), Boy Scouts of America (BSA), Sheriff’s Department, and local Search and Rescue (SAR) gathered to discuss the problems and the possible solutions. At this meeting the Sheriff’s office and local SAR were proposing to block off the passages where rescues could occur. Seeing that most of the passages within the cave lead to passages where visitors could get suck, we concluded that the friendlier approach would be to gate the cave and make it an access-by-permit-only cave. The discussion quickly turned to how to make the proposal happen.

The lease option

The state’s preferred solution was to lease the land to a qualified organization. This method would allow the organization to have complete control with the ability to manage the cave as they chose. However, to be a qualified organization, a million dollar liability insurance was needed, making the Timpanogos Grotto (or the NSS) ineligible. Being the highest use group, the BSA started the pursuit of a lease but quickly declined. The Recreation Department from Brigham Young University (BYU) led by Phil Brown was next to pursue a lease requesting that the Timpanogos Grotto provide the technical expertise on how to best gate and manage the cave.

For about 8 months, BYU showed a huge commitment to getting the lease. A deadline date was created to finalize the lease and construct a gate before Memorial Day Weekend 2005. As the summer rolled in, the lease application made it to the university’s President. On August 18, 2005, three months after the deadline, the real “wow” occurred - four drownings in a nearby Provo cave.

In Gollums Cave, the nearest cave to BYU’s campus, four drownings created a national tragedy story. The cave, mostly forgotten by cavers, was slowly becoming well-known by local adventurers. Two couples entered the cave leaving the odd man out waiting. They lined the mined entrance with candles, and then swam 16 ft underwater to reach a 5-ft long room barely big enough for the four of them. Their bodies were found in line all facing out about 6 ft from the water’s exit.

The largest news frenzy in Utah Caving history resulted. The Timpanogos Grotto website hits jumped from an average of 8 hits per day to close to 200 hits/day. The word of the accident was carried nationally. Even a CNN segment was filmed on the story, but it was booted due to arrival of Hurricane Katrina. Such a story was expected to create many changes as it stressed the need to seek increased safety and training through local grottos. No newcomers were brought in to the grotto meeting; however, the BYU lease of Nutty Putty Cave was then officially dropped. The lease shortly pursued by the Recreation Department of Utah Valley State College (UVSC). The lease option was no more.

The Management Agreement

Many months passed without a word. In late November, Neil Nokkentved from the Daily Herald called for an update. I gave him the scoop on the failing leases and what I felt may be the state’s next move. The state had a strong stand on the need to change the “status quo” at Nutty Putty Cave. Because the lease had failed, I assumed the state would soon close the cave. Immediately after the interview, I called SITLA to ask if there was anything else left to pursue.

The idea of the Timpanogos Grotto managing the cave through a Management Agreement was explained to me. Under such an agreement, the Timpanogos Grotto would manage the cave; however, all regulations and actions would need prior SITLA approval.

I called back Neil to explain to him the course of action. Unable to withdraw the original article, two were published. The titles changed from “Fate of popular cave still in limbo” to “Cavers trying to keep cave open.” The state representatives weren’t amused by the new chain media

coverage. To avoid open debate from media and outspoken cavers, the progress of the future meetings was only discussed amongst cavers that were showing an invested interest.

During the next six months, Chuck Acklin and I met every other month with the SITLA representatives to work out the details of the Management Agreement. Being concerned about how the high visitation to Nutty Putty Cave may be transferred to its other caves, SITLA discussed the need to close the other nearby caves: Blowhole, Rabbit Trap, and Silly Putty. While our meetings were occurring, SITLA also looked into designs and contractors. To save access to all of these caves, they all would need to be gated and managed together.



The Indian Blanket in Blowhole Cave Jon Jasper

The original concept was to create an interest group lead by Timpanogos Grotto to manage Nutty Putty Cave. The interest group would consist of any group with an strong interest in helping manage the cave. Complying with the guidelines and requirements agreed upon with the state, each group would then manage its group's keyed access to the cave. When concerns would arise, the necessary changes would be negotiated between the Timpanogos Grotto and SITLA.

However, due to the high number of anticipated break-ins that would require lock and key changes, initially combination locks were used. A website approach was also created so that permits could be evaluated and approved in a timely manner. The hope was to quickly reestablish visitation to help advertise the successes and to protect the gate.

Gating and management begins

On April 14, 2006, the Management Agreement was signed. The gates for Silly Putty and Rabbit Trap Caves were ready and waiting. Both gates were installed on April 18, 2006. On April 25 and 26, Blowhole Cave gate was constructed. On the last day of the construction, Dale Green, Cami Pulham, and I heard the first radio announcement of the gating of Nutty Putty Cave. When I returned home, I had about a dozen messages from various media sources wishing for interviews. The craziness had begun.

The gating of Nutty Putty Cave was originally planned for the week after the installation of the Blowhole Cave gate. However, I decided to let the news sink in, give a chance to gather permits for access, and a bit of badly needed organizing and prefabricating.

The gate construction occurred in the beginning of the week just before Memorial Day Weekend. With a crowd of about a dozen helpers and 20 hours of work, on the early morning of May 24, 2006, Nutty Putty Cave was gated. That afternoon, I issued the first permit from my front door to some folks we denied access during the construction of the gate.

The Nutty Putty Cave gate survived the first weekend despite many threats. However, in the first weeks visitors didn't hesitate to take advantage of the gate's flaws. They were able to break in with ease, however with no harm to the gate. We made a couple of additional short trips for necessary modifications to strengthen the security and to paint the gates.

The gate was designed to allow break-ins to occur without costly damage to the cave. The main idea was to replace locks to minimize gate repairs. Amazingly, the first lock replacement at Nutty Putty Cave wasn't until September 23. This replacement was after two lock replacements at the 60 ft-long Silly Putty Cave.

In the past, with the high use, trash removal seemed to be a losing battle. Each weekend new accumulations of beer cans, sweat shirts, and misplaced bodily fluids would appear. With the permit system, keeping the cave free of trash was a more reasonable goal. Trips were immediately planned to remove trash around on the surface

and throughout the entire cave. Trash pick-up sticks were used to remove the trash previous visitors tried to hide within the cave's cracks. The cave's notorious odors of sweat, rotting garbage, and bodily waste were eliminated.

The permit process forced visitors take more time in preparing their trips into the cave and identified the necessary preparations and possible risks. In addition, to increase safety down the Great Slide, a stainless-steel cable ladder replaced the long-standing rope handline.

Paying it back

After the gates were completed, the time came to collect the funds that were pledged. Timpanogos Cave National Monument supplied the equipment (welder/generator, cutting torch, chopsaw, etc) and expertise (Cami Pulham's and my time). The entire amount of the profits from the 2005 Utah Valley Rocky Mountain Regional, about \$400, were devoted and another \$600 was donated directly from the Rocky Mountain Region's fund - an interesting consequence of blindly electing three Timpanogos Grotto members to serve as Chair, Vice-Chair, and Treasurer of the Region. The Timpanogos Grotto donated \$600 from its general funds (of which \$100 was from a NSS Cave Conservation Award). The last donator was from the newly formed Western Cave Conservancy. They offered to match up to \$5,000, however being the last hit up, just paid the remaining cost of \$700. So in the end, \$2,300 covered the entire costs of the four cave gates, a stainless-steel cable ladder, locks, and a light intensity datalogger.

Saving Nutty Putty

When I first started visiting Nutty Putty Cave, helmets and good sense seemed to be extremely rare. Boy Scouts and college kids visited the cave with little or no preparation or leadership. This project was a collaborative best attempt at saving Nutty Putty Cave from its total closure.

This project has been four year journey involving many interested people from many different organizations. Even though the uphill battle to bring Nutty Putty Cave under management has been won, the "real" battle of "saving the cave" is just beginning. Many of the past visitors will

not accept such a dramatic change. Many cavers don't understand the full issues at stake or the burden the caves' manager voluntarily takes on. Must we wait until a life is taken before showing concern? Must we wait until the cave is permanently closed until to help save it?

You too can still make a difference. There are many ways you can support our efforts. For some, the easiest way is to volunteer your time and expertise; for others, it maybe through financial donations. Many volunteer projects exist picking up trash in or around the cave, helping with education on safe, low impact caving, or simply helping with checking and replacing locks. Donations, to pay for locks, to provide for gas for repair visits, and to create educational outreach and training opportunities, can be accepted. Please send checks by making checks out to the Nutty Putty Cave Fund; Timpanogos Grotto; c/o Richard Downey; 380N 600E; Orem, UT 84097-4843.



Nutty Putty cave gate Jon Jasper

Getting Permits for Access

If you are wishing for access to Nutty Putty Cave or Blowhole Cave, first visit the most up-to-date access requirements at <http://www.caves.org/grotto/timpgrotto/NuttyPuttyAccess.html>. All requirements must be fully understood and followed by all of the trip participants prior to the trip. Then follow the links to download and submit a request for a permit to the present manager, Justin Epps. These permits must be signed by all participants, showing they all read, understand, and are willing to follow all of the cave access requirements. When completed, the permit can be faxed to: (435) 654-3989 or mailed to: Justin Epps; PO Box 817; Heber City, UT 84032 within a reasonable amount of time (5 to 7 days) for Justin to respond before your planned trip.

Restoration of Bloomington Cave

Kyle Voyles

After decades of neglect, two rescues and one fatality, Bloomington Cave finally caught the attention of the Bureau of Land Management (BLM). Starting in January of 2005, a large scale restoration project began to improve the cave's appearance and appreciation. After 7 weekends, 48 volunteers, and \$86,000 worth in volunteer time and donations towards graffiti removal using sandblasting, Bloomington Cave has made a dramatic comeback. (See *Utah Caver Annual 2005* for more details)

Shortly after the initial restoration was completed, the St. George BLM agreed that a Cave Management Plan was needed. A rough draft was presented to management and the content was accepted; however, the format needed to be changed. After a couple of months of debate, the new version was completed and the Environmental Assessment (EA) review process was started.

The process included conducting biological and cultural inventories. In doing so, numerous invertebrates, including pseudoscorpions and a hammerstone, created from a type of green chert, not previously found in this area, were discovered.

Sometime between the end of the restoration and March of 2006, the north entrance of the cave was tagged with bright orange spray paint. On March 14, Jon Jasper and Justin Epps drove down to assist in removing the spray paint with angle grinders and to start work on a temporary educational kiosk.



Angle grinding off graffiti *Jon Jasper*

The spray paint removal went well; however, the kiosk installation didn't go well. The area where we choose to place the kiosk was solid rock and impossible to dig, so the kiosk was put on hold for a couple of weeks.

At the end of March, Jon drove back down in St. George to help build the kiosk again and to take measurements to design and build the cave gates that BLM was requesting. The kiosk was simple to build, but digging holes in the limestone proved very difficult. Jon rented an electric jackhammer for a couple of days, and we proceeded to dig three large holes in the solid limestone bedrock. The process took almost a full day while building the kiosk only took a couple of hours.



Temporary educational display *Jon Jasper*

The following day Jon and I measured for cave gates using his laser level for great accuracy. Once Jon and I finished the gate design, I provided these plans to the BLM with an estimate of required materials. Within two weeks, I had the materials ordered and waiting to be delivered.

In the meantime, a catastrophic fire started near Bloomington Cave and quickly devoured everything in sight. All the fences in the area that had wooden poles, any type of structure and all signs for miles around burned. The only thing that survived the fire without incident was the cave's kiosk.

About May of 2006, I convinced the BLM powers-that-be to finally take a trip to the cave with me so they could understand what we are working towards. They were very impressed at our efforts and ambitions and got a good understanding of issues.

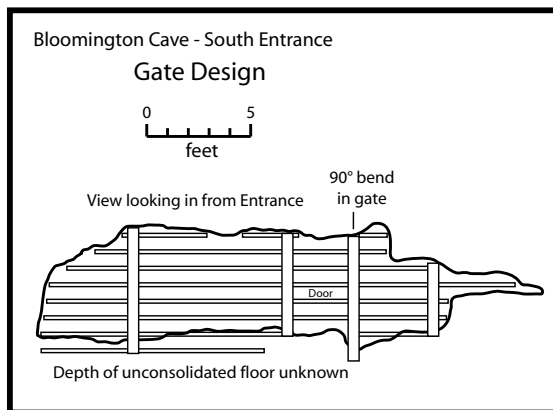
To date, the BLM has purchased a four-paneled kiosk. Each panel measures 30 inches by 40 inches. It will have a roof and lockable doors for easy access to update its content and displays, and is constructed entirely out of steel.

The BLM has all of the steel ready to go for the cave gates, and the BLM has purchased materials to build a split rail fence to delineate the parking area at the cave so people won't be driving and parking all over the place.

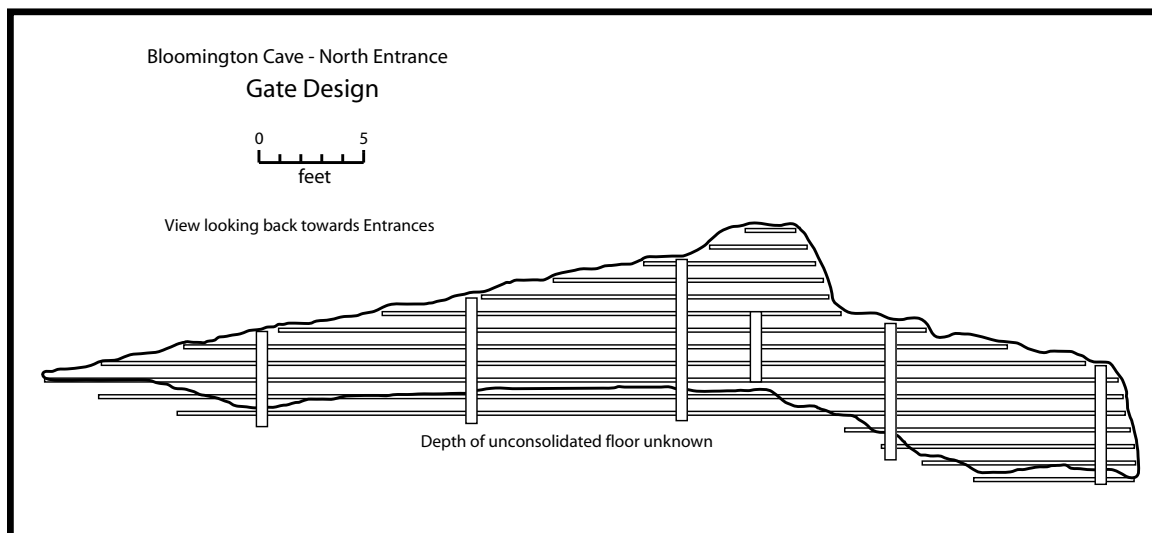
The biggest obstacle now is to get the EA completed so the gates can be installed. I have provided management with hundreds of pages of docu-

mentation plus maps, pictures, and our inventory results to assist in the process. I have numerous people reviewing the cave management plan. However, there has been a set back. A Recreation Planner has convinced the managers that the most important management aspect is visitor satisfaction and not visitor safety or natural resource protection. He has changed the management direction from writing a "Cave Management Plan" to writing a "Project Plan" that doesn't even address our original issues. I was blatantly told that "a visitor's happiness is more important than a visitor's safety". I seem to be fighting an uphill battle.

In the meantime, I am working on getting a permit system in place and getting people involved in the construction of the cave gates, kiosk, and parking lot delineation.



Gate designs for Bloomington Cave Jon Jasper



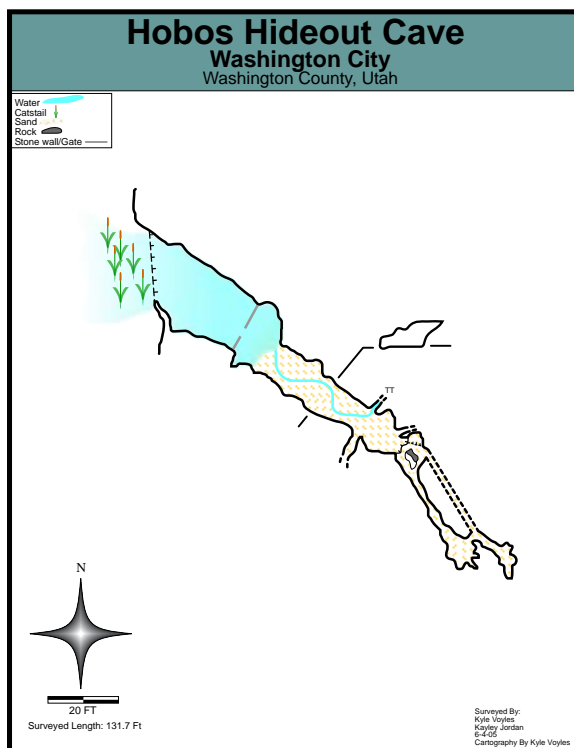
New Subdivision Threatens Hobos Hideout Cave

Kyle Voyles

The Utah cities of St. George, Washington, and Santa Clara and the surrounding areas are experiencing phenomenal growth. It seems that every single day there is a new subdivision going in or an existing one is expanding.

Developers don't seem to care what they destroy or what natural resources they may threaten in order to get another dollar. Some of the resources that I have witnessed being buried under asphalt and concrete are hot springs, very large and significant rock art sites, lava tubes, gypsum caves, and dinosaur tracks to name a few. Their greed seems to know no bounds.

So here we are once again faced with the destruction of a natural resource in the names of profit. Hobos Hideout Cave, located in the northern portion of Washington City, is a small cave in sandstone that trends southeast to northwest along a normal fault for a length of 132 feet. Along this fault are several springs. The largest spring exits from Hobos Hideout Cave.



Map of Hobo Cave *Kyle Voyles*



Spring entrance to Hobos Hideout Cave *Kyle Voyles*

The cave itself is not impressive or unique on the grand scale of caves, but it is a rare and unique resource for the southern Utah area. It is home to a colony of bats (unidentified as of yet). The spring and its riparian area are also home to spring snails, frogs, fish, and any number of other types of wildlife, all of which is in the process of being buried.

I have lodged complaints, concerns, and criticisms, but my voice seems to be overpowered by the almighty dollar.



Stream within Hobos Hideout Cave *Kyle Voyles*

Cave Millipedes in the Rocky Mountains

Bill Shear

Cavers by nature are fond of discovery and exploration and are used to pushing to the limits to find new passages and leads. But many cavers are unaware that another form of exploration can be equally rewarding and exciting - discovering new cave life.

Nonaquatic animals adapted for life in the cave environment are called *troglobionts*. Most of the species are Arthropods, a phylum of animals that includes insects, millipedes and centipedes, spiders, scorpions, ticks and mites, and shrimps and lobsters. While few lobsters are to be encountered in caves, millipedes are often abundant. This fascinating group of animals has held my attention for nearly 40 years, and I have a special interest in the species occurring underground. In fact, my doctoral thesis, finished back in 1970, concerned the millipede genus *Pseudotremia*, undoubtedly the dominant troglobionts in Appalachian caves.

Millipedes are one of the least known groups of animals. While more than 10,000 species have been named and described world-wide, it may be that there are as many as 100,000 total. The chances of finding a millipede species completely unknown to science are thus quite good - in fact, my students here at Hampden-Sydney College in Virginia have found two new species only a few yards behind our science building! In Washington state, the collectors and I have found literally scores of new species, and even two new families (this would be rather like discovering cats or dogs for the first time).

An exciting frontier for new millipede species and indeed for new troglobionts of all sorts is the karst of the Rocky Mountains and Great Basin. Recent contacts with collectors and cavers from these regions have resulted in not only new species discoveries, but the resolution of 'millipede mysteries' more than a century old.

As an example, a paper to be published soon is based on the collection of new specimens of the unusual genus *Idagona*, made by Jon Jasper in caves in Logan Canyon, by Gretchen Baker and Steve Taylor in caves in Nevada, and by Dave Hubbard in Idaho lava tubes. *Idagona westcotti*, the Idaho Lava Tube Millipede, was first named

by John Buckett and Michael Gardener back in 1967. This animal is about 0.75 inches long, pale in color, and with many long legs. It has now been found in several lava tubes in the Snake River Plain in Idaho, most recently by Hubbard in 2000. The millipedes are part of a cave ecosystem that also includes spiders, centipedes, several insects, and harvestmen. Just this last year, Jon Jasper found similar animals in caves high in the Bear River Range of Utah, caves in the famous Tony Grove region of Logan Canyon that are among the deepest known in America. While similar to the Idaho Lava Tube Millipede, these proved to be an entirely new species and have been named *Idagona jasperi*, Jasper's Cave Millipede. At about the same time, specimens of *Idagona* of a very different sort were taken in Water Trough Cave in Great Basin National Park of Nevada by Baker and Taylor, and these have been named (at Steve Taylor's suggestion) *Idagona lehmanensis*, the Lehman Caves Millipede recognizing the Lehman Caves, one of the main attractions of Great Basin National Park.



Millipede in Millipede Cave, AZ Jon Jasper

Meanwhile, the Great Basin National Park biologists were ranging farther afield and discovered several more new species not just in Nevada but

to the south in the caves of the Arizona Strip (the section of Arizona north of the Grand Canyon). Out in California, news reports focused on an array of about 27 new species that have been collected in caves of Sequoia and Kings Canyon National Parks. Three of these were millipedes, and I am working on them now.

A millipede mystery involved a species known as "*Polydesmus cavicola*" described from a cave near the Great Salt Lake back in the 1880s. The original description was inadequate to recognize the species, but from new material collected in 2001, I was able to deduce that this minute species not only belonged to a new genus, but also represented a family that had not been found in western North America before.

It takes a bit of work and dedication to collect cave animals, but the rewards are great. Not only does one get the excitement of the hunt, but potential immortality is in the wings. A species named for its collector (as in *Idagona jasperi*) preserves that collector's name in the scientific literature for all time. It's been my pleasure to name species for many cavers. Not only personal benefits accrue. The presence of an animal species in one or a few caves can be a potent tool for cave conservation. In several eastern states, including Virginia, the majority of designated endangered or threatened invertebrate species are troglobionts. Their presence ensures that the caves they inhabit will be preserved and protected.

Collecting cave animals, including millipedes, requires a sharp eye. *Idagona* millipedes are on the large end of the spectrum of size for troglobionts. Most cave-dwellers are small, often just a few millimeters long, and their capture requires careful searching. Small size is an adaptation to the very limited food supplies that are usual in caves, but some cave animals (including some new centipedes from Colorado and Idaho I am working on) are relative 'giants' among their kind, because caves with supplies of guano from bats or crickets, or with abundant plant matter washed in, are actually rich in food and there is little competition for it. But even these 'giants' rarely top an inch in length.

Conservation of cave animal populations has to be balanced against the benefits of the knowledge we can gain about them from preserved specimens. While we have traditionally regarded the popula-

tions of cave animals as sparse and vulnerable, new studies done in arid Australian caves suggest that because tiny cave creatures can inhabit spaces much smaller than those accessible to humans, total populations might be quite large, with only occasional individuals emerging into larger voids where they might be seen and captured. If no animals have been ever described from a given cave, a reasonably sized sample (10-15 individuals) is needed because we require mature individuals of both sexes for naming and description. Collecting beyond these modest numbers should wait for more careful assessments of population densities.

Cave millipedes and other arthropods should be collected into 75-80% alcohol (rubbing alcohol from the drugstore works fine) in glass or solvent-resistant plastic vials that can be tightly sealed. Labels giving the locality, the collector's name, and the date should be written in pencil on good quality paper (not filing-card paper) and placed INSIDE the vial. This data is vital and if stuck to the outside of the vial, could be lost. Specimens can be searched for around any organic matter, like wood, leaves, or various kinds of guano. Sometimes baits like smelly cheeses can be left in caves on one day and visited a day or two later to collect any scavengers attracted to them. These baits should be removed after collecting is done.

Rocky Mountain and Great Basin caves await biological exploration. Interestingly, one of the great authorities on millipedes in the 20th century was Professor Ralph Vary Chamberlin, who had a long career at the University of Utah. Thus, I encourage Utah cavers to keep their eyes open for troglobionts, collect examples, and contact me at wshear@hsc.edu. A discovery of something really new and exciting may await you. For more detailed information on millipedes, visit http://www.fieldmuseum.org/research_collections/zool-ogy/zoo_sites/millipeet/index.html

Old Timer's Reunion - Celebrating Utah's Caving Pioneers

Rodney Mulder

In January 2006, in a Salt Lake Grotto meeting, Dale Green mentioned that his 50-year caving anniversary was coming up in April. We were surprised and awed. Being the motivated socialites that we are - we did nothing about this news.

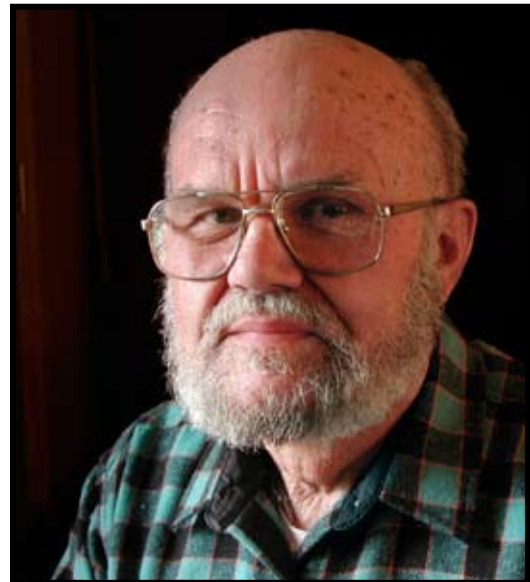
The February meeting rolled around, and Dale mentioned the anniversary again. Dale is not a bragging man, but was revealing this information to plan an anniversary caving trip to his first cave, Garner Cave in Ogden, Utah. I was struck with a serious concern not to let that landmark go unrecognized.

Dale Green is the father of Utah caving - in a true sense a living pioneer. Dale has been instrumental in every aspect of Utah caving evolution. Being a nephew of Vearl Manwill, discoverer of Timpanogos Cave, you may say "discovery and exploration is in his blood." He has given significant contribution to exploring Utah caves. Realizing the significance of Neffs Cave, Dale set out on his first cave survey. After a 30-hour long day, Dale and his team surveyed the cave from entrance to bottom. The 1165 ft deep Neff's cave held the United State's depth record for the next 20 years (and the western hemisphere's record for the next 7 years). Dale then continued making the first maps of most all of the local classics like Timpanogos, Lehman, Logan, Bloomington, Nutty Putty, and Big Brush Creek, to name a few. He was the first to enter Nutty Putty Cave and countless others. And Dale was the first to inventory the numerous cave entrances of the Tony Grove area.

In 1952, William Halliday and Dale formed Utah's first grotto, the Salt Lake Grotto. Amazingly, Dale has been active in the Salt Lake Grotto from its conception to present day. With his long-term dedication, he is known nationally for his vast knowledge and long-term efforts in Utah caving. Recently, Dale has created a Utah Cave Conservancy for distributing funds for the protection of Utah caves.

Thinking about Dale's legacy made me think about two other old timers, John Lyon and Earl Petersen. The thought dawned on me that I hadn't seen either of them in a very long time. I

hadn't really noticed them missing, because I had been absent for a long time myself, only making occasional meetings. Then a memory struck me. I remembered Earl Petersen handing over the grotto library to me - not because his term was up, but because he was seeing himself come to less and less meetings. Earl and John were like "two peas in a pod;" if one was there, so often was the other. But this grotto meeting, I realized that they were both absent. They were no longer members. Knowing I had missed a lot, I asked Duane McCully (Salt Lake Grotto Chairman 2006) if the Grotto had done anything to recognize them. I sensed a little guilt as he told me they had not.



Dale Green

Cami Pulham

John Lyon and Earl Petersen also are Utah caving legacies. John Lyon was one of the original teenagers that discovered and initially explored Neffs Cave using hand-over-hand techniques. He was the only initial Neffs' explorers who serious pursued caving. And it is not odd to see John hiking Neffs Canyon today. Earl Petersen led many mapping projects such as the original map of Polygamys End and Lehman Annex Caves. Earl has many legendary stories of his heroics in pushing Big and Little Brush Creek Caves. It be hard to imagine what Utah caving would be like without the foundation built by the old time cavers such as Dale Green, John Lyon, and Earl Petersen.

This issue became the topic of discussion for the after-grotto social held at Taco Time. We were disheartened to think that we had let John and Earl slide away unappreciated and decided to make amends. In addition, we were not going to let Dale's anniversary go by silently. We started brewing a plan.

Our old timers were by no means the average cavers; they are Utah's caving pioneers - our living legends. They each have served our grotto for near, at, or in excess of half a century. Every year our state celebrates its pioneers, of which most are long gone. We are fortunate to know our pioneers and to personally hear, learn, and appreciate their devotion, experiences, and discoveries. We are lucky to be the generation to follow in their footsteps. Heartfelt agreement was the sentiment of all who learned of our plan.

THE PLANNING

Although I do not consider myself a socialite or party planner, I was, nonetheless, tasked as the event organizer. The members of the Salt Lake Grotto agreed to make this event very special. It would include catering, plaques, storytelling, and special invites for the honorees. Tickets were to be sold for this event, and any caver near or far who would like to join in the celebration was openly invited.

Recruiting

My first duty was to recruit. Duane McCully took the responsibility to produce the commemorative plaques which would be presented to the honorees. Jon Jasper took the responsibility to produce a commemorative audio-visual show. Larry Spangler (Salt Lake Grotto), Rob Cranney (Timpanogos Grotto), and Valerie Stratford (Wasatch Grotto) took the responsibility of contacting current and past grotto members (of their perspective grottos) to promote the event. Larry did a spectacular job tracking down and notifying cavers who had moved away or were unknown to current grotto members. Tami Jensen took the role of decorating the facility which was to be used.

As the organizer, I handled all the unassigned tasks, which included: searching for an event facility, producing the advertising flyer, locat-

ing and contracting the caterer, and my favorite task, handling the special invites for the honored guests.



**John Lyon & Earl Petersen
at 2005 Dark Zone Exhibit**

Jon Jasper

Location selection

Obtaining a facility was more difficult than I expected. They are very expensive with a lot of alcohol restrictions. Hal Smith was very considerate to help us out by offering the Lyons Club in Copperton. This facility had everything that we could ask for and was offered at no charge.

Scheduling

I had the unenviable task of trying to coordinate the schedule of the facility with the guests of honor (and their wives), without any of them knowing.

I told John and Earl separately that we were planning to throw Dale a 50-year anniversary party, but we needed him to be there to furnish stories and photos of Dale. I told them not to tell Dale. I felt bad about deceiving them, because I'm sure they must have felt neglected that we had done

nothing to recognize John's 57 years and Earl's 47 years of Utah caving. Nonetheless, on with the deception.

Similarly, I told Dale that we were throwing John and Earl a "retirement party". I similarly asked him to furnish photos and stories of them. I asked him not to tell John or Earl. Once more, I felt bad about deceiving my friends. So be it, it was for a greater cause.

Finally, I had them all committed to show up and "help" with their celebration. So I locked in the April 29th with Hal Smith.

THE INVITES - SINGING TELEGRAMS

I did some research on the internet and over the phone and finally worked out some singing telegram invitations for the honorees.

Dale had an elderly looking lady named "Melba" come to his door. She claimed to be old friends with him from the Wasatch Mountain Club. She was flirting with him and trying to get him to remember her. Even though the wind was blowing and snow was coming down, Melba said she was a little warm. She took off her coat, her wig, and glasses. Finally, she took off her conservative dress, revealing quite a bit of skin and cleavage. At this point, she was obviously not an older woman, but a young one. Dale seemed confused and speechless, but grateful for the attention. She began to sing "For He's a Jolly Good Fellow" to Dale, inviting him to the honorary celebration. He was pleasantly surprised.

During the skit, I had been hunched behind a garbage can, trying very hard to control my laughter while I filmed the invitation.

Both John and Earl are married; therefore, I needed to be respectful of their spouses. Sending an "old fling" to the door would not, in my opinion, have been very considerate. Instead, we had a human-sized pink monkey go to each of their doors with balloons.

John was home with his wife. He was very receptive and even gave the monkey a hug. Petunia in the pink monkey suit gave him a very personable invitation to his honorary celebration.

Earl was very apprehensive to start, knowing only that he had a human-sized pink monkey on the doorstep with balloons, asking for a hug. He demanded several times to know who was in the costume. She said her name was "Petunia," and sang "He's a Jolly Good Fellow", then gave him his very personal invite. Earl had a look of great relief as he said, "Now I got it!"

I really enjoyed the honoree invitations. I was very pleased to see the delight these men had in anticipation. I had filmed all the invites, to be enjoyed later at the party.

The next thing to do was to make up the flyers and advertise. The flyer announced:

HEAR YEE, HEAR YEE, HEAR YEE
TO ALL CAVERS!!!

The SALT LAKE GROTTO announces a 1 time special event, to honor our beloved OLD TIMERS for their many, many, many years of service. We shall pay tribute to:

DALE GREEN (50 years caving), EARL PETERSEN (48 years caving), & JOHN LYON (57 years caving). This is a special catered event, for all those admirers and friends of these fine individuals. Join us for slow cooked BBQ ribs and chicken, a ROAST (that's a roast of the honorees), a tributary video production, and more. If you have been with the grottos for any time at all, you have been benefited by the work of our OLD TIMERS.

THIS IS A CAN'T MISS EVENT!!!

April 29, 2006

The Lions Club of Copperton began to come alive. Friends new and old began to gather. The guests of honor were warmly greeted. Dale arrived with a surprise; he announced that he was wearing his 50-year old suit to coincide with his 50-years of caving. Everyone was invited to get a drink and socialize. As dinnertime arrived, everyone took a seat. The guests of honor had their own table. I gave a brief welcome. The guests of honor along with their spouses, followed by everyone else, were invited to enjoy the fabulous dinner. Salad, potatoes, rolls, and corn, accompanied the scrumptious barbeque ribs and chicken. And there was plenty for those who wanted sec-

onds. During the dinner, the socializing continued. The dinner was followed by desert, which consisted of varieties of cheesecake.

The grotto officers awarded the plaques during desert. The plaques have the Salt Lake Grotto emblem engraved on them and read:

Lifetime Caver - Presented to Dale Green
In Appreciation and Recognition of 50 Years of
Cave Exploration, Conservation, Education, and
Fellowship.
Salt Lake Grotto 1956-2006

Lifetime Caver - Presented to John Lyon
In Appreciation and Recognition of 55 Years of
Cave Exploration, Conservation, Education, and
Fellowship.
Salt Lake Grotto 1949-2004

Lifetime Caver - Presented to Earl Petersen
In Appreciation and Recognition of 48 Years of
Cave Exploration, Conservation, Education, and
Fellowship.
Salt Lake Grotto 1956-2004

After getting their plaques, they each spoke to the audience and told stories of the others.

We all worked our way upstairs where we watched the video production assembled by Jon Jasper. This presentation included the invites that I filmed. It was very enjoyable. Cavers continued to socialize, until the evening grew late. It was humbling to see the respect and love that so many people had for our old timers.

There were several people not named here who assisted with the project, and their assistance was greatly appreciated. And thanks to all the cavers who made this event so special. And a final thanks to Dale Green, Earl Petersen, and John Lyon for their years of support to Utah caving.



Dale Green

Earl Petersen



John Lyon

Earl Petersen



Earl Petersen

Earl Petersen

In the Dark

Dave Shurtz

*My first cave trip, so long ago
I have to strain my mind*

Was as an infant coming into this life
The passage was of the tightest kind
The light at the end of the tunnel
Past a downward slope it lies
Was only seen after much travel
Twas done with two closed eyes

Then as the years passed, more passages sought
At five it was a culvert in an abandoned lot
At eight years old in our church I found
Under the stage was much like being underground
Where one could hide while Sunday school passed
In soothing darkness and quiet at last

As twelve seasons came and went their way
And we hiked the hills on hot summer days
An abandoned mine with timbers so old
From the days when men mined for silver and coal
Caused endless wonder and the darkest adventure
Though it met with my mother's most adamant censure

Nearly old enough to drive, with energy everlasting
Now experienced at mining and dynamite blasting
Because of an uncle who had discovered gold
But hadn't learned the lessons of finance I'm told
While searching the Uintahs for Old Spanish mines
We found places of wonder, Glory Hole and Porcupine

High school behind us, the world was ours to hold
A geologist offered us a quest so bold
With 600 feet of Goldline rope
We were off for the bottomless pits of Antelope
Twas not till the heady days of college at Weber State
That I learned of the NSS, Wasatch Grotto and met my fate

Now the years have passed, with many good friends gained
Lots of projects accomplished, though many remain
Caves discovered, explored, the maps hung in the hall
And I find from first to last that I have loved it all



Snow falling into Boomerang Cave *Rob Cranney*

Exploring the Deep Caves of Tony Grove

Jon Jasper

In May 2006, efforts within the Tony Grove Cave Project began expanding into Logan Canyon to include Nielsons Cave. The cave was rigged down to its established 880 ft depth to look into some old leads. New bolts were added within Fantasy Well to look into a large rumored lead within the 300-ft shaft. With a better vantage point, no lead could be seen. On another trip the Ancient Streamway was followed upstream. Peter Hartley rigged a traverse line across Spiffy Deluxe Pit and followed a tight 2 ft wide by 20 ft tall passage. This passage arrived at a 15 ft climb up which Jon Jasper ascended and fixed a rope. The passage continued a distance upstream where it started having trouble with the amount of breakdown. Following a side lead through the breakdown the passage led to a sizeable breakdown room with a large 150+ ft dome. Needing to get Jason Ballensky to the airport, we exited with all intentions of returning to map. When trips returned in September, problems with snow storms and rain left the lead unsurveyed. However, later at a Timpanogos Grotto meeting we learned that the lead had been previously found and ignored due to better downstream leads. They coined the name *Megadome*.



Peter Hartley exiting Nielsons Cave *Jon Jasper*

In early August, the first trips into Main Drain Cave were lead by Dave Shurtz and Brandon Kowallis. Dave Shurtz started the survey and led most of the survey trips into Main Drain Cave; oddly, this was his first trip to the bottom of the cave. Dave Shurtz, Brandon Kowallis, and Thorpe Cox surveyed 737 ft in a walking lead off of the Overflow Hall ending in a another sump, an upstream lead out of the Breakdown Room, and an upstream lead off of the Bypass Route. Exiting the cave, Dave Shurtz's illness gave him great difficulty as he left many surprises behind.

The next trip Brandon Kowallis, Gretchen Baker, and Cory Kowallis started the survey up Neffs Canyon. The lead contains one of the cave's largest streams dumping into the Deeper Than Neffs Pool. Jon Jasper fixed a traverse line to swing into the lead. He then jumped ahead to rig a line up the 20-ft cascade falls that Peter Hartley scooped to on the original discovery of Overflow Hall. He then went off to lasso climb near the Breakdown Room (2004 End Room).

Jon was hoping his climb would lead him into an upper trunk passage just above the Overflow Hall that would lead west past the Breakdown Room. He successfully got up about 35 ft to find a small bellycrawl. He followed the crawl for about 50 ft where it ended with water dripping noises in the distance. He returned back to his group surveying up Neffs (Inlet) Canyon. After a short time the group froze out and exited surveying 325 ft of 20 ft high by 4 ft wide passage.

Jon Jasper returned on a solo short weekend trip. First, he headed in to rerig the entrance drop for safer and easier use. The entrance originally followed the path straight down into the cave. Any objects such as ice, rocks, or gear, would fall straight down the rope's route. Dave Shurtz claims to have witnessed a Volkswagon-sized ice cone fall the last hundred feet. With the entrance freezing and thawing, lots of loose rocks and ice were problematic especially for winter or early season trips. The original route also had a major rub point over nasty sharp rock. Cami Litchford took a bad swing on descent that sliced completely through the rope's outer sheath.

The new route descends the entrance to a re-belay point just before the top of the first ice cone. Then one descends the ice cone over to the passage wall. Here one could get off rope and comfortably wait. Then one descends the remaining 100 ft near the wall of the cave free from falling objects. This rigging also cuts the needed entrance rope length in half as the rest of the rope can remain fixed.

The next day, Jon did a solo surveying trip up Neffs Canyon. After about 365 ft of survey he ended at the junction where a small stream enters. Peter Hartley returned later with Andy Poczobutt, Joann Poczobutt, Willie Hunt, and Brian Gindling to survey an additional 273 ft of practically straight 30 ft high by 6 ft wide canyon passage. The passage continued as good as ever.

Alan Hinman led a crew in starting the survey of Hunters Cave (aka Over the Hill Cave). Hunters Cave is the highest Tony Grove cave with an entrance elevation of 9,600 ft. This cave has a maximum depth potential of 4,200 ft to the Woods Camp Spring. He surveyed the cave to 420 ft in length and a depth of 190 ft. The cave was stopped by an ice plug.

In 2006, 1,700 ft were added in Main Drain Cave bringing its total length to 1.8 miles (9,510 ft) and an unchanged depth of 1,227 ft. Added with Hunters Cave survey, a total of 2,120 ft were added to the Tony Grove Cave Project bringing the total project survey length to 3.12 miles (16,466 ft).



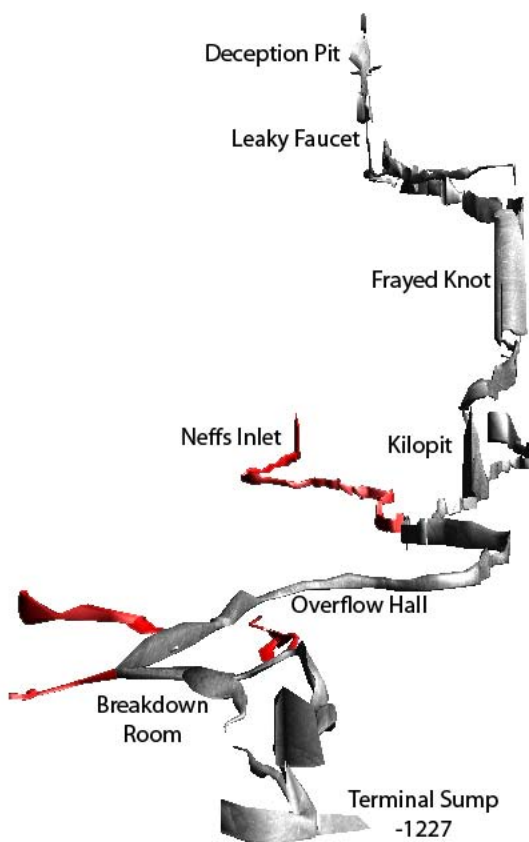
Main Drain in late winter *Dave Shurtz*

On February 17, 2007, Peter Hartley led the first winter trip into Main Drain Cave. Peter Hartley, Mike Frazier, and Carl Bern did the overnight cave trip while John Cox and Dave Liddell did

surface support and bivouacked in Snow Cone. The trip lugged camping gear for a return three day trip and checked the water levels. The final sump was lower but still over 10 ft deep and needing diving gear. The 15-hour trip was a success.

Peter Hartley returned on March 17 with John Cox, Brian Gindling, and Jim Nicholls. The entrance throat had lots of thawing ice and the Leaky Faucet Pit was sealed with ice. At the end of the short trip, the entrance ropes were starting to ice. After a weekend camping on the hill, the main objectives weren't successful; however, they did show that the cave could be done even at temperatures near freezing. They were paving the way for early season trips into Main Drain.

Tony Grove is experiencing one of the lowest snow years in 28 years. Main Drain trips may begin as soon as late May or early June, several months before the usual start of late July or early August. This low water year may be what is needed to continue through the Hunters Cave's ice plug or continue the downstream exploration through Main Drain's many sumps.



Main Drain Cave looking upstream towards entrance - 2006 exploration in red *Jon Jasper*

Geology of Logan Canyon and Tony Grove, Utah

Jon Jasper

For a past few years now, the Tony Grove Cave Project has been collecting cave entrance and survey data. The data has been input into a Geographic Information System (GIS), so that it can be displayed with other data layers. The most common use is a simple topographic or aerial overlay. However, more layers have recently been developed to accurately display Logan Canyon's geology (Dover 1995) and groundwater hydrology (Spangler 2001).

The resulting map shows very interesting geologic relationships. Most of the developed caves occur within the Silurian Age Laketown Dolomite. Even Wood Camp Hollow Spring which drains all of the Tony Grove and Nielsons area occurs in the Laketown Dolomite. Due to the high 15 degree dip of the axis of the syncline, the caves have no need to penetrate the undissolvable Swan Peak Quartzite that can be seen within the cliffs of the Tony Grove Lake area. The major caves such as Main Drain, Nielsons, Polygamy, and Polygamys End, can flow from entrance to spring all within the Laketown Dolomite. The caves in Tony Grove developed as canyon passages and pits following the stratigraphic dip and fractures. As the caves are pushed farther downstream, the passages should start to trend along the strike following the structural contours to the spring in well-developed master conduits serving as the area's internal "main drains."

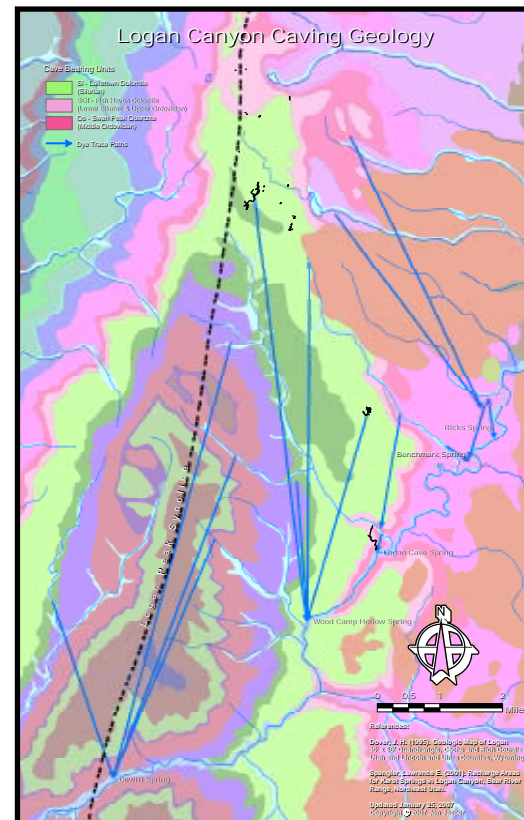
A few caves lie outside of the Laketown Dolomite such as Logan Cave and the pit in the White Pine Basin. Logan Cave and Ricks Spring have developed below the Swan Peak Quartzite in the Garden City Formation. Their expanse of possible passages and hydrology is limited to the Garden City Formation. Similarly the White Pine caves seems to show limited development within the Fish Haven Dolomite.

The axis of the syncline nicely corresponds to the Bear River Range's ridgeline in alignment with Dewitt Springs. The Dewitt Springs drainage possibly once served as the primary internal drainage for the Bear River Range and is being pirated to the more rapidly developing Wood Camp Hollow Springs drainage. If so, dry, high remnant passages may exist that used to flow to

Dewitt Springs. Future cave exploration will hopefully be able to map the gaps between Main Drain, Nielsons, and Wood Camp Springs for more definitive conclusions.



Outcrops seen from Tony Grove parking lot
Brandon Kowallis



See map index for full view *Jon Jasper*

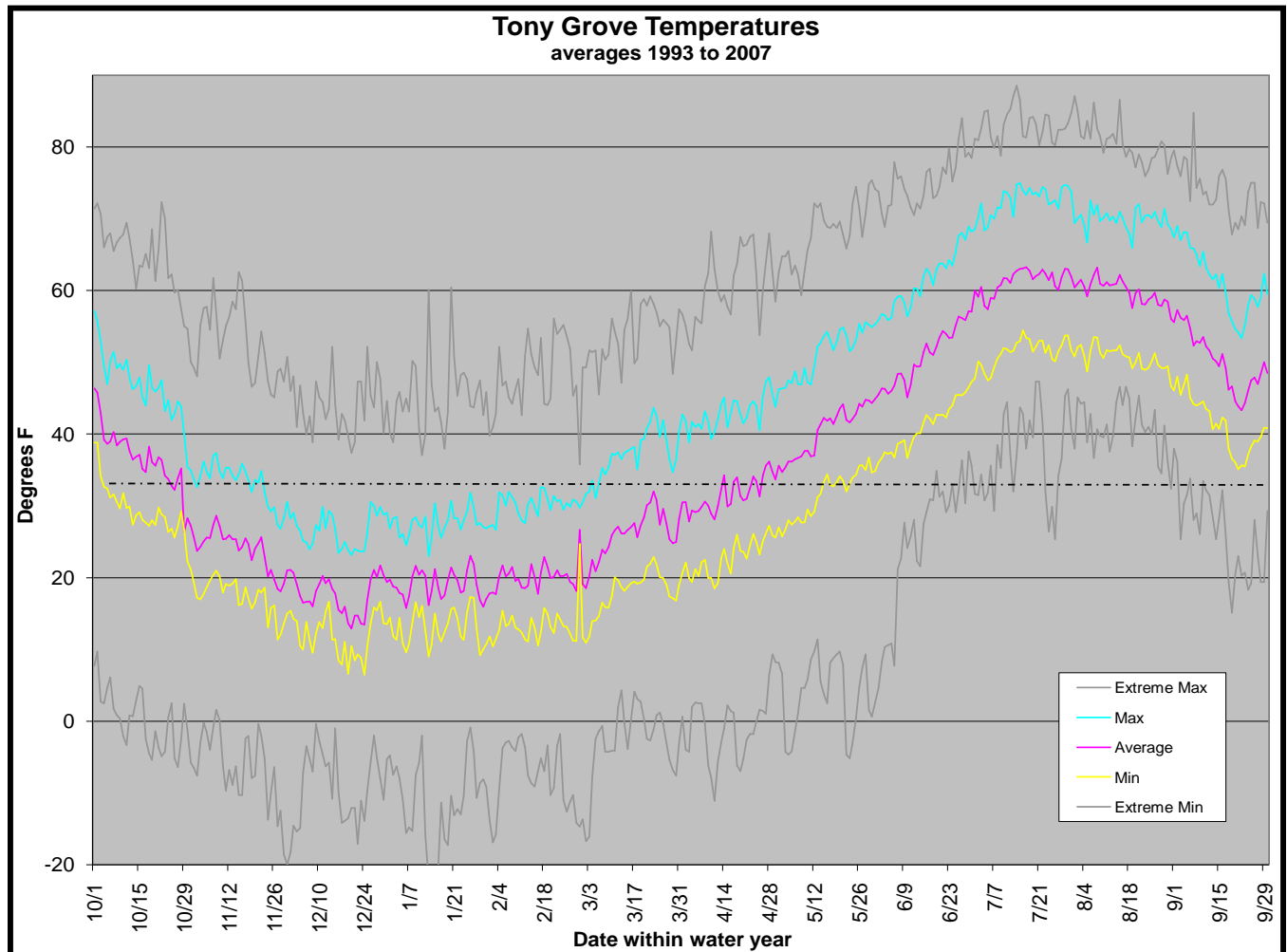
Charting Tony Grove's Weather

Jon Jasper

Weather plays a huge role in successfully exploring alpine caves. One of the main problems with current exploration in Tony Grove is getting a sense of the weather for appropriate planning.

Last year, while looking for the nearest weather station, I realized that the Tony Grove area had its own. The station is located at an elevation (8,400 ft) equal to the top of the cliffs just above the lake on the ridge northeast of the parking lot. This station has been recording daily temperatures and snow pack for the last 28 years! This data gives an unique opportunity to understand Tony Grove's weather to help plan better and more effective trips.

Knowing the expected temperatures aids in planning both summer and winter trips. In the summer, high minimum temperatures can make camping and waiting for exiting cavers very pleasant. As shown, mid August has the highest daily minimums, for the best overall summer caving and camping experience. For winter trips, hitting temperatures below freezing is important to lock up water. These below-freezing maximum temperatures reduce risk by minimizing freeze-thaw cycles as well as creating the lowest yearly water levels in the caves. These conditions usually occur in late November to late February.



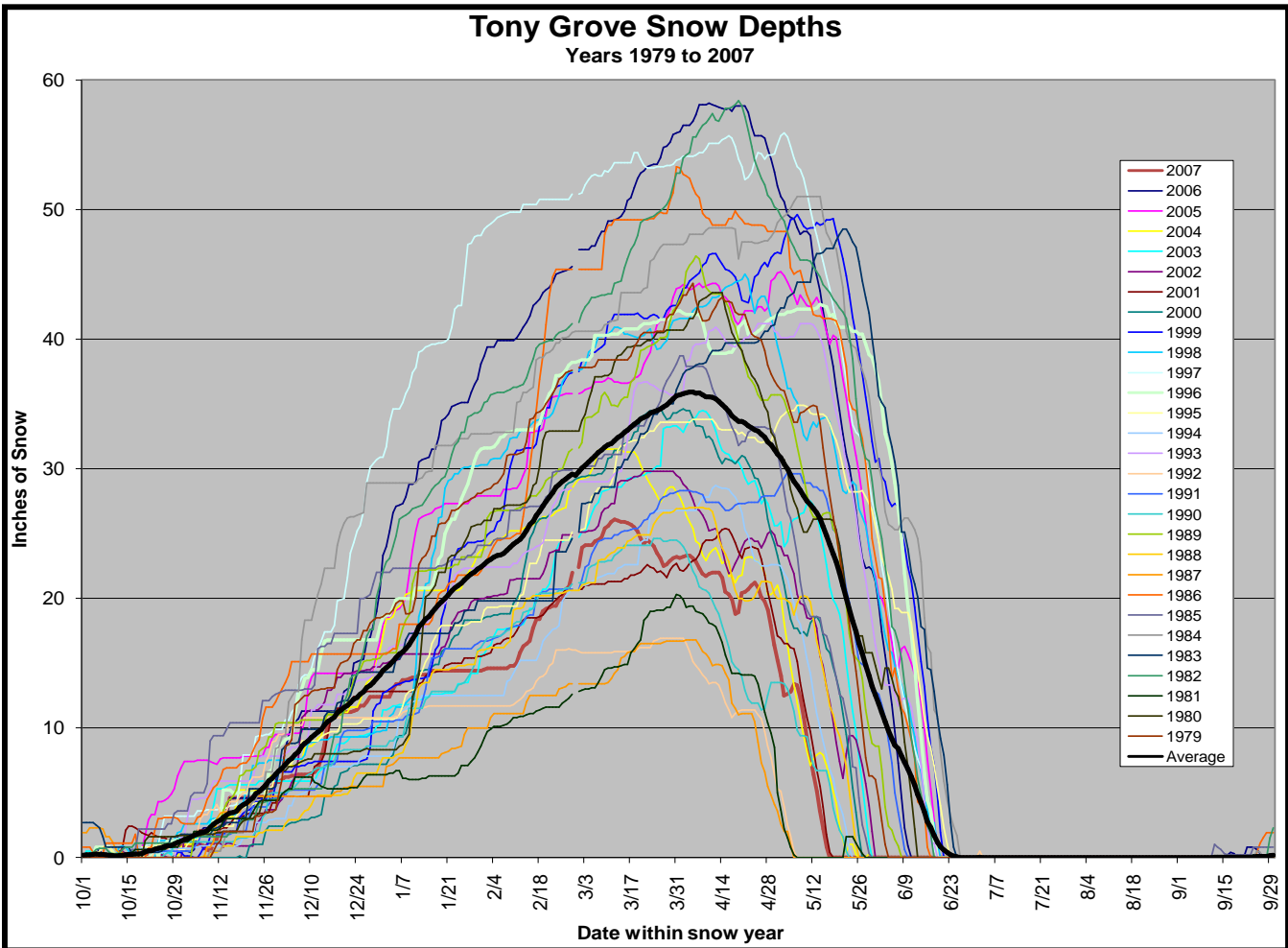
Plotting the historic yearly snow depths, the yearly snowpack trends can be studied. The average season where the parking lot should be clear of snow is from late June to mid October. Interestingly, the 2005 to 2006 winter had the greatest amount of snowpack (58 inches) in the 28 years recorded. Looking at 2006 to 2007 winter shows one of the lowest snowpack seasons. So in the last two years, we should be able to experience the contrast between a high and low water years in back-to-back seasons.

For current readings at Tony Grove Lake Weather Station visit <http://www.wrh.noaa.gov/mesowest/getobext.php?wfo=pih&sid=TGLU1&num=48>

For the Tony Grove Lake Weather Station's historic data, visit <http://www.wcc.nrcs.usda.gov/snotel/snotel.pl?sitenum=823&state=ut>



Tony Grove in early June 2006 Brandon Kowallis



Cave Map Index

Caving Geology of Logan Canyon, Utah

Baker Creek Cave System

Systems Key

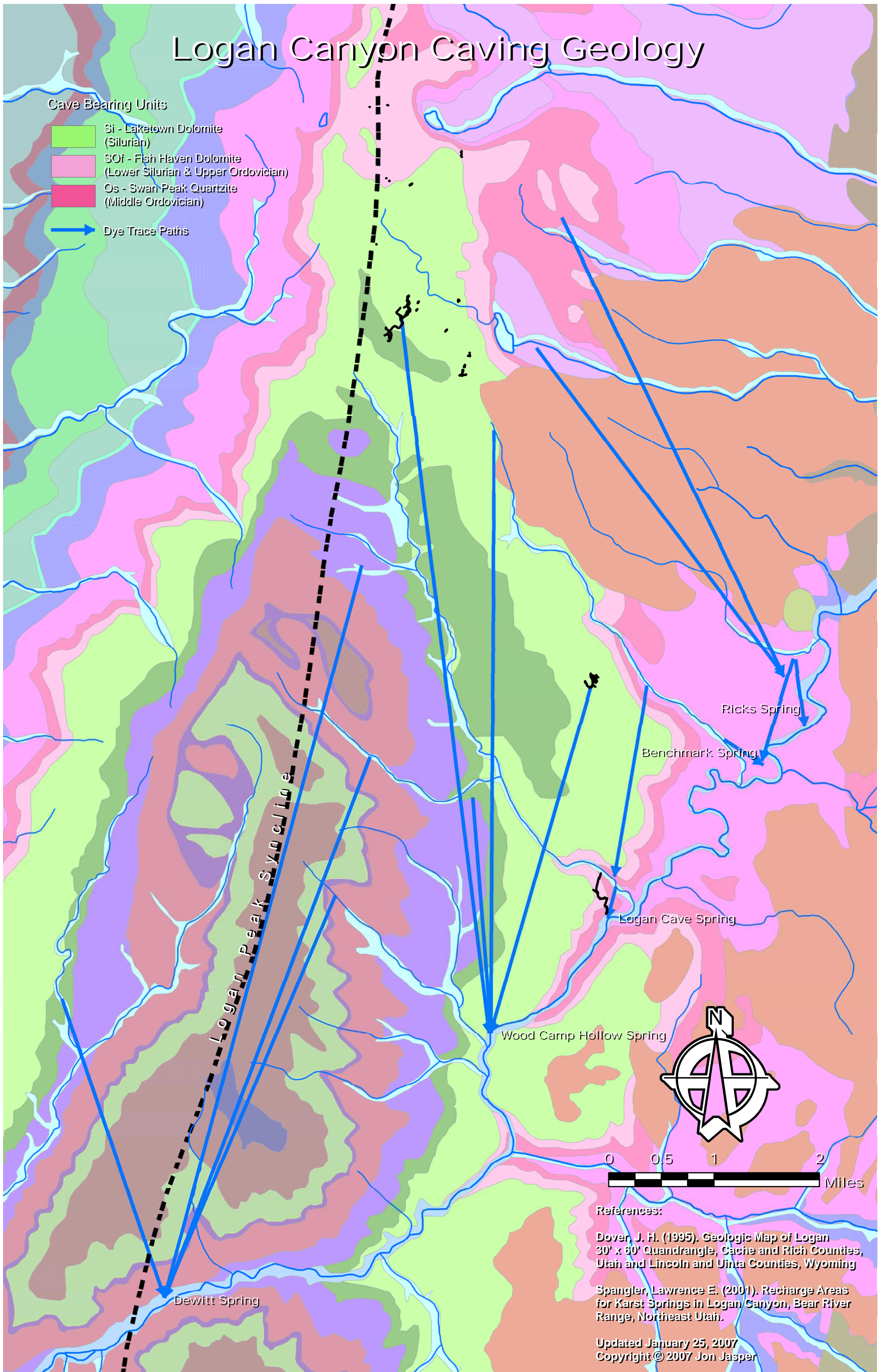
Little Muddy

Snake Creek Cave

Logan Canyon Caving Geology

Cave Bearing Units

-  Si - Laketown Dolomite (Silurian)
-  SO_f - Fish Haven Dolomite (Lower Silurian & Upper Ordovician)
-  Os - Swan Peak Quartzite (Middle Ordovician)
-  Dye Trace Paths



References:

Dover, J. H. (1995). Geologic Map of Logan 30' x 60' Quadrangle, Cache and Rich Counties, Utah and Lincoln and Uinta Counties, Wyoming

Spangler, Lawrence E. (2001). Recharge Areas for Karst Springs in Logan Canyon, Bear River Range, Northeast Utah.

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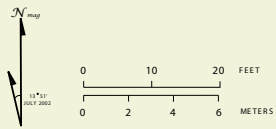
Systems Key Cave

WHITE PINE COUNTY, NEVADA
GREAT BASIN NATIONAL PARK

SUUNTO COMPASS & TAPE SURVEY BY:

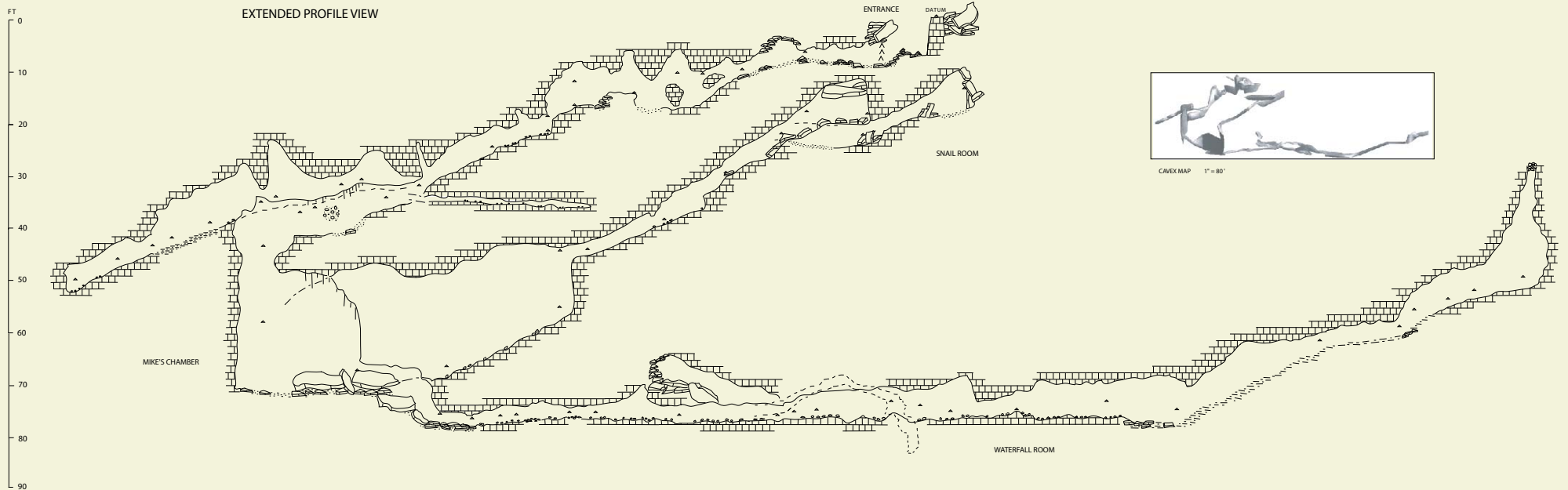
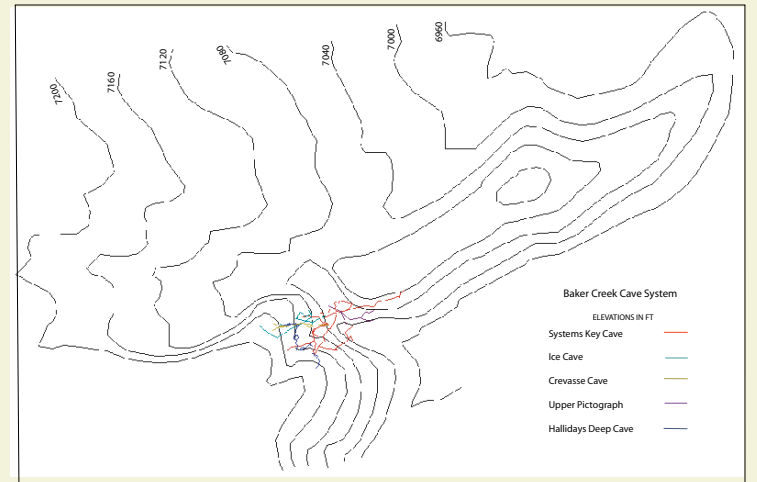
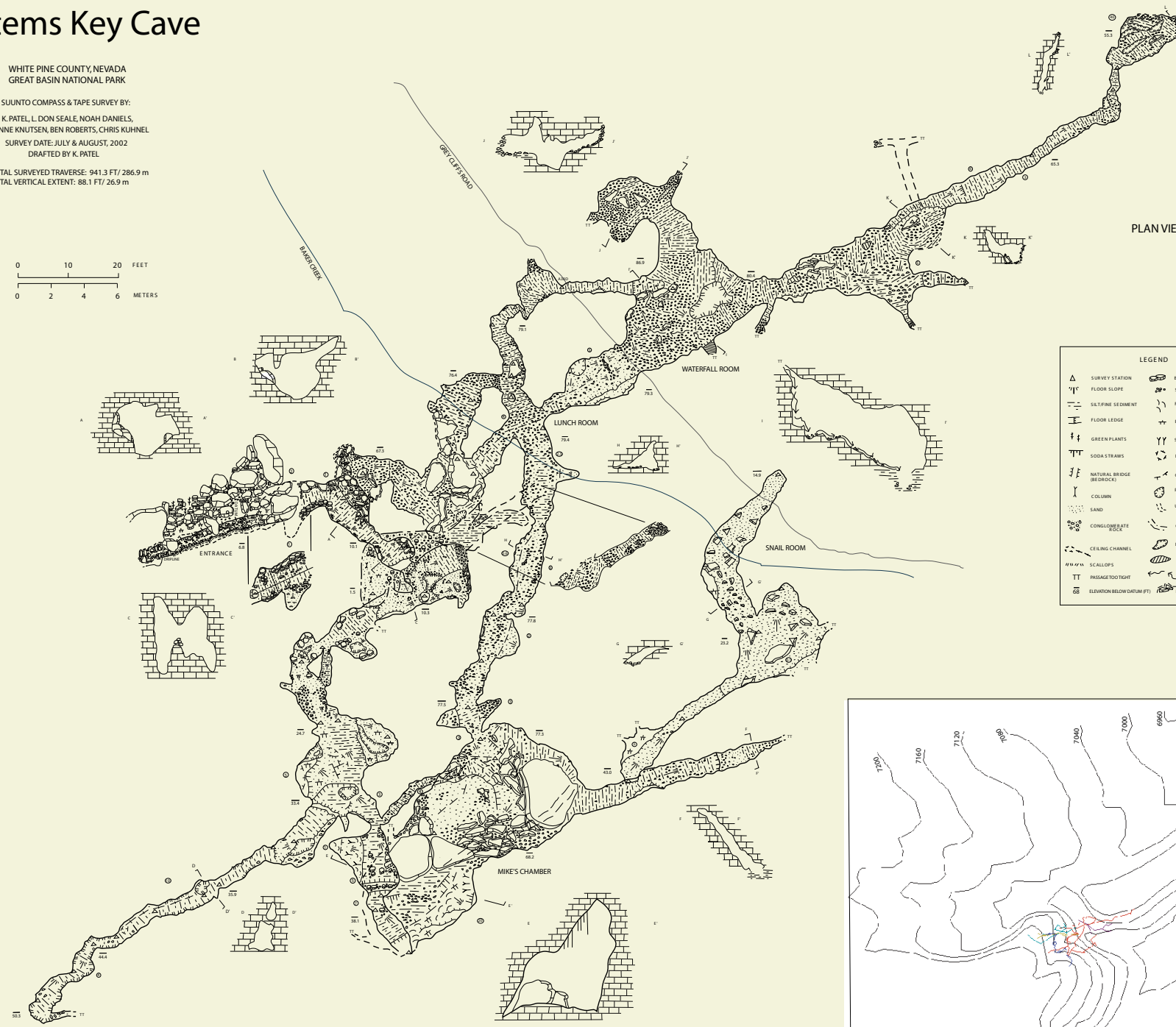
K. PATEL, L. DON SEALE, NOAH DANIELS,
KARINNE KNUTSEN, BEN ROBERTS, CHRIS KUHNEL
SURVEY DATE: JULY & AUGUST, 2002
DRAFTED BY K. PATEL

TOTAL SURVEYED TRAVERSE: 941.3 FT / 286.9 m
TOTAL VERTICAL EXTENT: 88.1 FT / 26.9 m

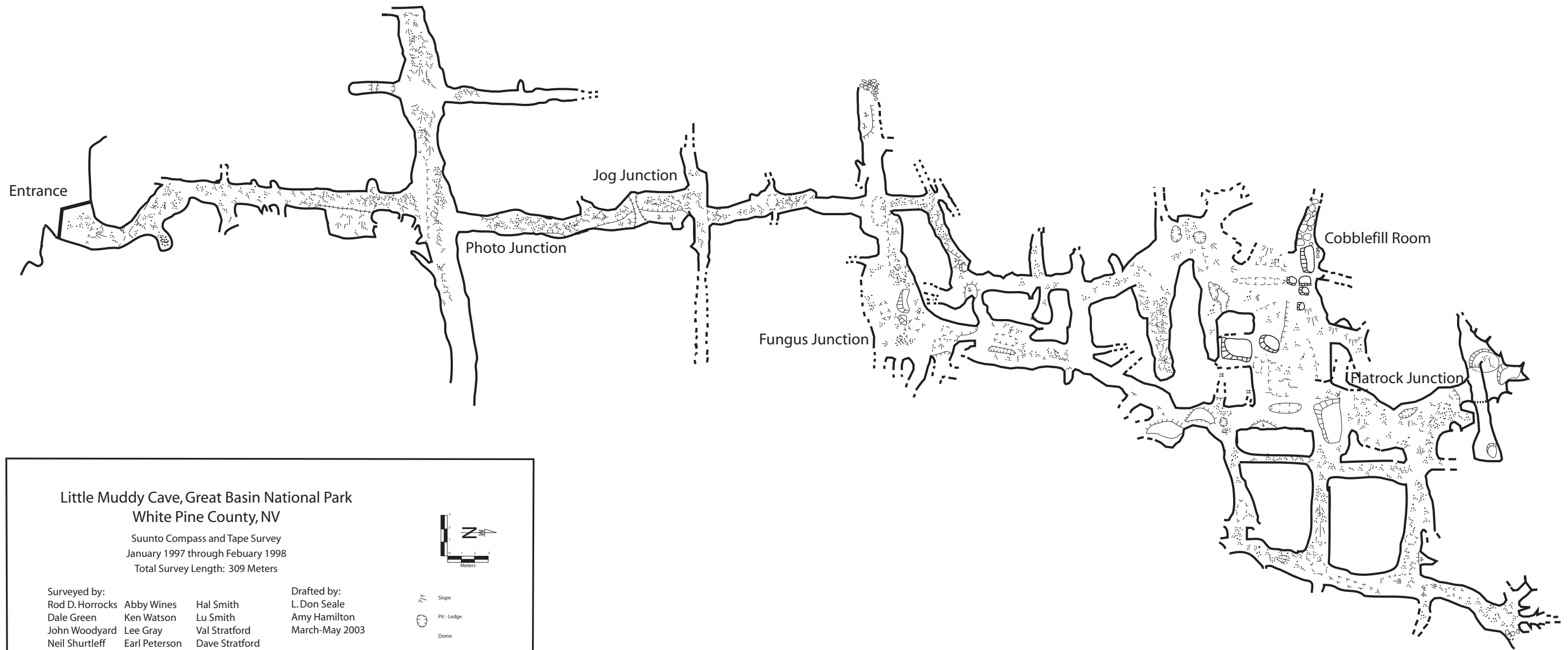
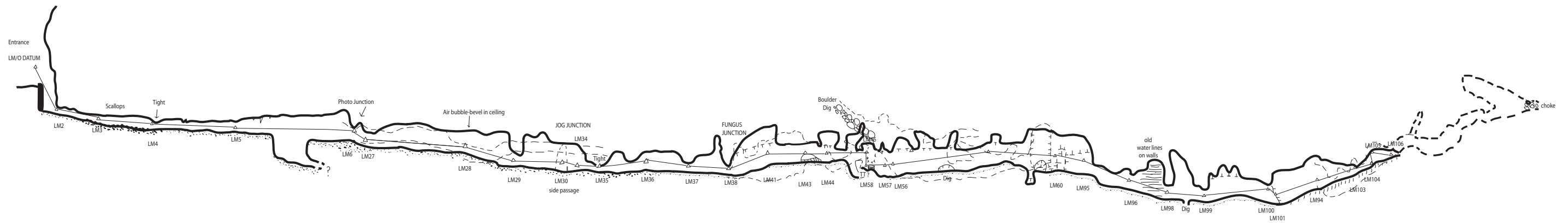


PLAN VIEW

LEGEND	
△	SURVEY STATION
▽	FLOOR SLOPE
▬	SILT/FINE SAND/CLAY
▬	FLOOR LEDGE
⊥	GREEN PLANTS
⊥	SODA STRAWS
⊥	NATURAL BRIDGE (BEDROCK)
⊥	COLUMN
⊥	SAND
⊥	CONGLOMERATE
⊥	CEILING CHANNEL
⊥	W/W/W
⊥	SCALLOPS
⊥	PASSAGE TOO TIGHT
⊥	ELEVATION BELOW DATUM (FT)
⊥	BREAKDOWN
⊥	SMALL BREAKDOWN
⊥	FLOWSTONE
⊥	BEDROCK
⊥	STALACTITES
⊥	DOME
⊥	CEILING LEDGE/CEILING LOWERS
⊥	PIT
⊥	UNDERLYING PASSAGE
⊥	OVERLYING PASSAGE
⊥	BEDROCK PILLAR
⊥	WATER
⊥	PERENNIAL WATER FLOW
⊥	INDETERMINATE BREAKDOWN WALL

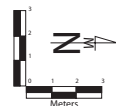


CAVE MAP 1" = 80'



Little Muddy Cave, Great Basin National Park
White Pine County, NV

Suunto Compass and Tape Survey
January 1997 through February 1998
Total Survey Length: 309 Meters



- Slope
- Pit - Ledge
- Dome
- Rocks Gravel

Surveyed by:

Rod D. Horrocks	Abby Wines	Hal Smith
Dale Green	Ken Watson	Lu Smith
John Woodyard	Lee Gray	Val Stratford
Neil Shurtleff	Earl Peterson	Dave Stratford
Rose Shurtleff	Mike Marion	
David Harris	Rodney Mulder	

Drafted by:

L. Don Seale
Amy Hamilton
March-May 2003

Snake Creek Cave

Great Basin National Park
White Pine County, Nevada

Length = 1,682 ft (0.32 Miles)
Depth = 57 ft

Surveyed:
7/24/1998 to 12/8/1999

Surveyors:
Jon Jasper
Abby Wines
Dorie Stolley
Kurt Danielson
Chuck Acklin
Andy Acklin
Bryan Spreggs
Justin Epps

Drafted by:
Jon Jasper

Legend

	Slope
	Rock
	Bedrock
	Guano
	Popcorn
	Dripstones
	Sodastraws
	Flowstone
	Anthodites
	Ledge & Pit
	Ceiling Rise & Dome

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