

The

The Kansas City Area Grotto

Volume 25

Issue 1

Jan 2012

Guano

Monitoring Caves on the ONSR
P-Bar-X Expedition in Wyoming
The Gating of Flippen Cave



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Events

April 26-29

Spring MVOR. Perry County, MO.
<http://www.mvor.org>

May 4-6

SERA Cave Carnival. Estill Fork, AL.
<http://www.caves.org/region/sera/CaveCarn.htm>

May 19-26

NCRC Cave rescue and Operations Seminar. Camp Skyline, Mentone, AL.
<http://www.caves.org/commission/ncrc/national/2012Seminar/seminar2012.htm>

June 25-29, 2012

NSS Convention. Lewisburg, West Virginia. <http://www.nss2012.com>

September 21-23

Fall MVOR. Steelville, MO.
<http://www.mvor.org>

October 6-9

TAG Fall Cave-In. Lookout Mountain, GA.
<http://www.tagfallcavein.org/>

The Guano

Jan 2012, Volume 25, Issue 1

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The Kansas City Area Grotto is affiliated with the National Speleological Society and the Missouri Speleological Survey. KCAG is a founding member of the Missouri Caves and Karst Conservancy.

Meetings are held monthly. Check <http://www.kcgrotto.org> for dates and places.

Annual Dues: \$15 for full members [three caving trips with KCAG, nomination and vote of membership required.]

NCRC Callout number - Emergency use only! Central Region (502) 564-7815. This number may be used for cave rescue emergencies in the states of Illinois, Indiana, Iowa, Kentucky, Michigan, Missouri, Ohio and Wisconsin.

A Message From the President

Having been nominated and elected at the January meeting I am happy to serve as the president of the Kansas City Area Grotto for 2012. Jim Cooley, in stepping down from this position, has certainly left large shoes to fill; I will try my very best to do so. Mostly this will involve continuing the efforts set forth by Jim and our previous presidents. I believe that this is a grotto that has done well despite the prejudicial expectations set by our geographical inadequacies.



In looking at our past activities I particularly want to maintain the efforts of welcoming new members and training cavers. This year expect to have many learning and teaching opportunities including but not limited to one or more vertical training opportunities, and GPS workshops. Our social gatherings are always a fun time, and I often find myself counting the weeks before our summer picnic and Christmas parties. When possible there should be an associated campout with these workshop events, and a good sampling of hangout opportunities in between them.

More important than anything else I intend to lead this group in the direction which its members wish it to be lead. In order to do that I need input from YOU. Anybody with an opinion, a problem, or a plan is always invited to find me around a campfire, in a cave, at the cliffs of Swope Park, or stuck behind a computer desk on the other side of an email.

Cyle Riggs

Cover Photo

A Tricolor bat (*Perimyotis subflavus*) in Flippen Cave. These used to be known as Eastern Pipistrelles. Photo by Bree McMurray.

"Sow The Wind". August 2011. Monitoring caves on the ONSR. Article and photos by Ken Grush.

It is nice to be retired and have nothing to do not! But be careful what you ask for, you just might get it.

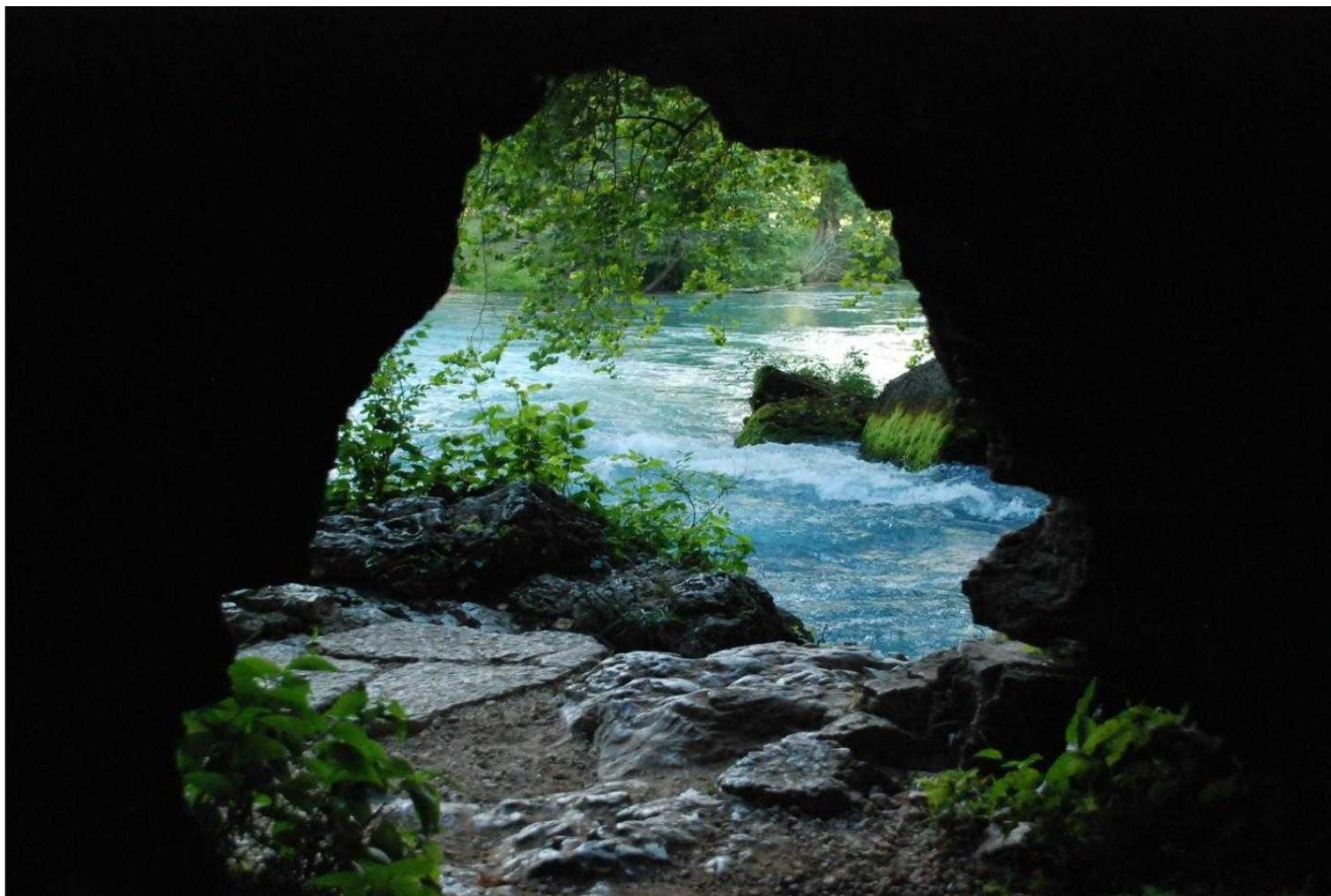
When I asked Jim Cooley what was on the schedule of upcoming activities, the answer was the usual: A backlog of survey and a host of volunteer projects on the Ozark National Scenic Riverways (ONSR). It didn't make much difference to me but

hopefully a little volunteer work now will allow us to continue to visit caves in the future. So, Jim and I were off for a rendezvous in the Carter, Shannon, and Oregon County Ozarks. We would meet in my favorite "roughing" it spot: The Powder Mill Research Center (PRMC).

And there was also the possibility of camping in Mark Twain National Forests -- something to look forward to when the daytime temperatures were hitting record highs, like 105F in West Plains.

The first day we went out to Carter County to monitor

Below: Looking out of the entrance to Big Spring Anastamosis Cave. Come be the millionth visitor! Photo by Ken Grush.



Lost Man and Cave Spring Caves, which are in close proximity to one another. The real objective was to size up Lost Man Cave for a new gate, but we'd also monitor Cave Spring, which is really more of a very large shelter than a cave.

In preparation, we read up a little bit on Lost Man Cave, a former permit cave until WNS (see postscript for de-con procedure) closed all caves on the ONSR, including Lost Man, to recreational caving. We both knew that the entrance might be a little tricky to navigate in order to evaluate the rest of the cave. So we put a rope as the first thing on our list to bring -- but, of course, when we added all the other items to bring, we never got back to the first item! The rope was still waiting for us when we returned to PMRC.

Despite that mishap, we were able to measure for and plan a new gate for the entrance. The current gate is an A-frame design that extends along the slot which is the entrance to Lost Man. It is constructed out of very light materials, even though bat-friendly. The park would prefer a less visible and hopefully more secure structure. The existing gate had been breached several times before, and we found that it seemed to have been breached again, this time by prying some of the longer



Above: Lost Man Cave requires a new, secure, low-profile gate. Photo by Ken Grush.

beams apart at the top of the A-frame.

After viewing the existing gate and thinking about a new design, we attempted to enter the cave. To our dismay, there was an obvious five foot drop at the base of the entrance slope. Now, it would be easy to enter this cave by simply dropping down from the ledge. The question was, could we jump up on the ledge to get back out of the cave? After assessing the situation, we thought the wiser decision would be to return with a rope, thus insuring our timely escape from the lower section of the cave.

We went on to Cave Spring Cave. It is readily accessible from the road and the short trail that leads to

the entrance. The cave has a wide and tall entrance with a man-made dam to control the flow for a grist mill that once operated at the site. Part of the mill is still standing just a little distance down the spring branch. Overall, there is about 90' of cave visible with the last part over shallow water.

This water pours through the old sluice gate and appeared to sump the cave just a short distance behind the dam. But the mystery was: What cave had we visited?

On the map CD for Scenic Rivers, CTR-004 is Cave Spring Cave and a perfect match for the cave visited on this day. There is even a small topo insert that is perfect fit for the local topography. However MoSpeleo

Volume 1 Number 4 has a description of the cave as in the vicinity of Lost Man Cave and warns the reader not to confuse this cave “with Cave Spring Cave..nor Cave Spring Onyx Caverns” both on Van Buren Quad. Bretz even reported a Cave Spring Cave but in a far different section, township and range.

Jim assures me that the cave we visited that day is not CTR-004, but was CTR-015; it pays to know someone familiar with the ONSR. And now I also know that not all maps are labeled correctly.

Day 2 was simply a return to Lost Man Cave (CTR-007),

but now with a rope! After negotiating the drop, we monitored the left hand or “East Passage” to its termination, which is about 400’ of scramble over breakdown and sticky clay. The right hand passage is a little shorter but contains a bit more breakdown and that same sticky clay. Near the end, there is a deep pit which we did not attempt. There is more passage down there but with shorter ceiling heights.

There was quite a lot of trash, enough to know that this cave has had more than a few visitors. Of course, we hauled all that we could find out with us.

For good measure we traveled down one of the nearby roads and stumbled across another cave right by the roadside. That would be Roadside Cave, CTR-052, on a Missouri Department of Transportation right-of-way, which was mapped by Scott House in 1982.

It was still too early to go back to the PMRC, so we traveled on to nearby Big Spring to do a little lock maintenance on a cave gate. We visited Big Spring Well Cave (CTR-001). This appears to be the remnants of a

Left: Cave Spring Cave is a nice place to cool off. Photo by Ken Grush.





Above: Roadside Cave is appropriately named. Photo by Ken Grush.

larger Big Spring Cave that must have stood here at one time. The hillside is littered with breakdown. Big Spring Well Cave is one of the few true talus caves in the state. “Talus” translates as breakdown or loose debris or, to cavers who want to continue growing old, as “you don’t want to go into this cave.” Scott House who had mapped this cave with several others in 1981, had told us that it was very dicey in there, quite unsafe. The entrance was not very enticing, either.

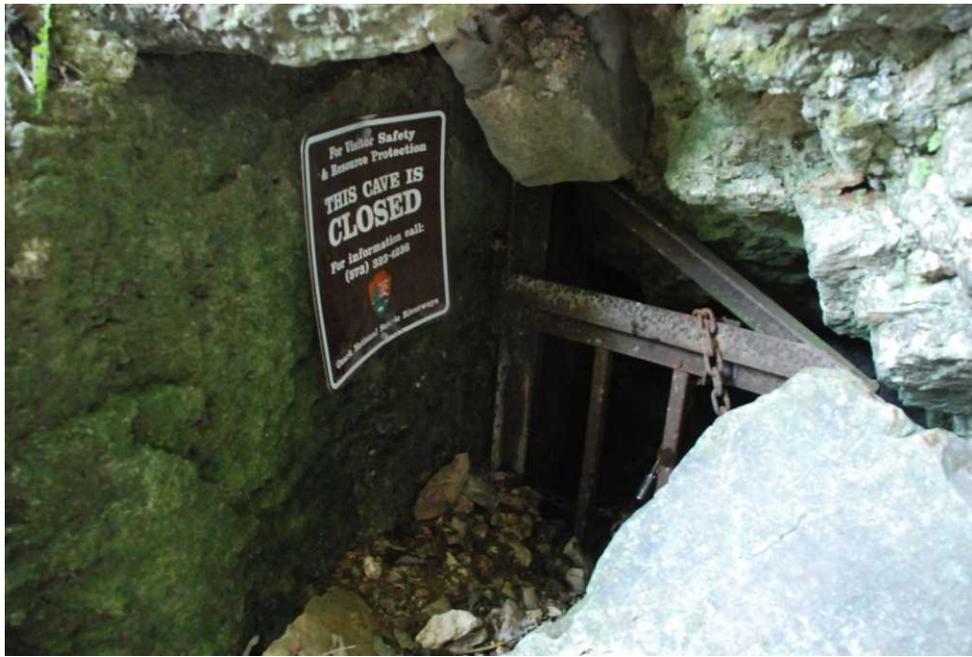
Big Spring Anastomosis

Cave (CTR-024) was nearby and provided a great photo opportunity. However, be forewarned you just might be awarded the “millionth visitor” pin to this cave. It is immediately above the main outlet for Big Spring. It is on the trail and is a must stop for every child who visits the spring with its parents.

Thursday provided an opportunity to get “off the reservation” and visit the Mark Twain National Forest (MT-NF). We needed to address a little of the survey backlog, so we tackled the continu-

ation of Canyon Cave (ORE-157). Shawn Williams, the first person to enter the far reaches of this cave in recent times, came down from St. Louis to assist, and we were able to complete the horizontal survey of the known cave.

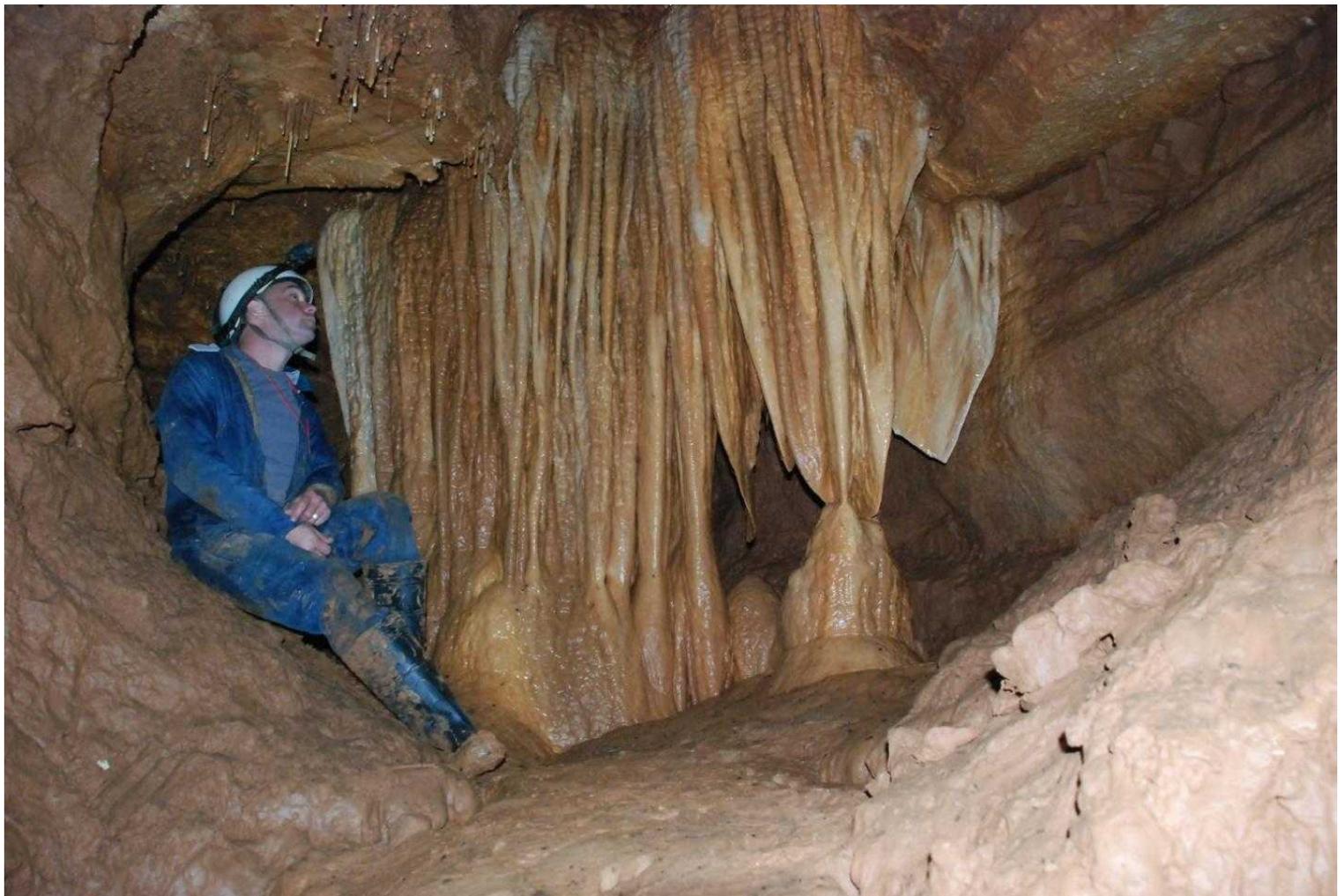
This was a push trip in that we wanted to stay as long as it took to wrap up the survey. We arrived mid-day, hiked the trail to the cave in intermittent rain, and were in the cave by early afternoon. The nasty “stromatolite squeeze” that



Above: Is the sign bigger than the entrance to Big Spring Well cave? **Below:** Shawn Williams in the balcony of Canyon Cave. Photos by Rick Hines.

guarded the passage beyond assaulted our senses with the usual halitosis of rotting vegetation and an ear-dip immersion that thoroughly soaked us.

As planned, we changed into dryer, warmer gear just beyond this squeeze, and survived the 450 feet of survey in comfort. We exited after midnight and hiked back to the vehicle. Mission accomplished! Of course we'll have to return for a final wrap-up for the map, but it felt good to be able to see a line drawing of the complete (?) cave.





Above: Jim Cooley and Shawn Williams secure the gate at Granite Quarry Cave. Photo by Ken Grush.

Day 4 provided an opportunity for recovery from the long day at Canyon Cave. But, of course, we didn't take that opportunity. Waking later in the day than usual, we finally got started on some more ONSR activities. We needed to visit three caves to do a little lock maintenance and monitoring. Granite Quarry (CTR-006), Little Granite Quarry Cave (CTR-062) and Coalbank Cave (CTR-023) were on the agenda.

Coalbank Cave, a major

gray bat maternity colony, was visited only to make sure the fence and lock were secure and the cave entrance at the bottom of the large sinkhole had not filled with debris. The nearby drainage feeds straight into the cave and can easily block the entrance with flood debris. It has been known to do so and has had to be dug out in the past. All was good, so we headed on to the next objective.

As implied, the two Granite Quarry Caves are close to

one another and readily accessible, other than the steep scramble to get to the entrances 100' up a steep, weedy (read: poison ivy), rocky slope. Both caves are gated, but the larger entrance has a flyover gate while the smaller cave only needs two or three pieces of short angle iron to bar this crawl entrance. A quick investigation satisfied the curiosity that these caves were faring well, with little indication of vandalism or trash.

Shawn departed early the next morning. The day provided Jim with the neces-



Above: The gate at Onyx Cave has been breached - again! **Below:** Measuring for steel to make permanent repairs. Photos by Ken Grush.

sary time to secure some of the iron “saw-horses” that are used as welding benches for cave gating. George Bilbrey met us at PMRC and assisted with strengthening of the horses. George also performed extensive preventive maintenance on the park-owned electrical generator, a critical component in cave gate building. During lunch, George regaled us with tales of mapping nearby Powder Mill Cave, which is over eight miles long. I did some house-cleaning for the center to keep our “invitation” open.

Our last day at PMRC was





Above: This gate at McCormick Cave is the very definition of "Bat UN-friendly"! A more suitable replacement gate is being planned. Photo by Ken Grush.

used to monitor the entrances to Welch Spring Cave and Medlock Caves. Both gates were checked and the locks oiled. Again, as both of these caves are gray bat maternity sites, we did not enter the caves themselves.

The trip was complete except for one small side trip on the way home. We got an early start the next day. Traveling up toward Rolla, we came into Eminence and were greeted by a complete rainbow spanning the north-to-south view of the town. What a sight to behold on

the last day!

This "little side trip" only took all day! Jim and I, with the assistance of MTNF personnel, went out to scope out a reported new breach and to measure Onyx Cave (PUL-027) for an upcoming gate repair and strengthening. This gate has been breached three times by dedicated vandals. While there, we cut up some 20-foot six-inch-by-six-inch angle iron and some 20-foot one-inch steel rod, so Jim could get it into his car and onto his small trailer to take it back to Kansas City.

There, he will fabricate piece parts for these gates. Later, Jim and I scoped out McCormick Cave (PLP-034) to determine some of the logistic requirements for a planned re-gating.

And eventually you "reap the whirlwind" - Seven days in the field, 13 caves visited and at least one cave survey brought closer to completion. I'm worn out, covered in poison ivy outbreaks ... and chomping at the bit for the next opportunity!

Postscript: One whirlwind we all hope to avoid is the further spread of White Nose Syndrome (WNS). Although

we followed decontamination procedures after each return to our vehicle, to report each event for each day in this article would be tediously redundant.

Park-provided jumpsuits and cave gear were used on the ONSR whenever possible to eliminate the possibility of bringing in WNS spores on clothing or gear that had been used outside the park. Our procedure was to change out of our cave gear and clothing as soon as feasible (but always before contam-

inating our vehicle), trash-bag the gear and clothing, and contain the bag to prevent cross-contamination. We brought along duct tape to seal off our bags. We each had multiple changes of clothes and boots for each day. When thoroughly slimed, a complete pressure washing at the Van Buren car wash was required to demud the clothing and gear prior to decon. For light soil, a hand-powered demudding with a garden hose sufficed to ready everything for a

“dunk in the soup.”

When we returned to base, we isolated our gear and proceeded with decon as soon as possible. After complete demudding, the mandatory ten minute (or longer) soak of all clothing and gear in a 1:128 Lysol IC Quaternary Ammonium solution was followed by a fresh-water rinse to remove the decontaminant. Thanks to the excellent facilities at the PMRC, we were then able to launder all clothing and get prepared for the next trip.

Below: Jim Cooley in the entrance to Little Granite Quarry Cave. Photo by Ken Grush.



P-Bar-X Cave Expedition. August 2009. Article by Shawn Williams. Photos by Shawn Williams, Ben Miller and Dan Nolfi.

When Ben first mentioned the P-Bar Cave expedition to me early in 2008, my mind did not hesitate convincing my heart to commit. Though I was born in Colorado and have returned there many times for skiing, and lived in Las Vegas for a spell, I had never been to Wyoming. The Bighorn Mountains were finally calling me!

I had over a year to plan for the trip. I've never been much of a planner. I didn't scrutinize the topo map nor did I thoroughly read the geology report or the last trip report from 1979. I definitely did take note of the map of the cave. A sad, simple map if there ever was one. No offense directed to the original contributors! A remap seemed appropriate. I added a few things to the gear list and ordered all my food for pickup at R.E.I. only a week before our scheduled departure day: Saturday, August 1st, 2009.

Having just started a new job on July 1st, I was elated when they ok'd my request for 11 days off. Maybe it pays to have a boss who's also a caver! Originally, I had planned to arrive in Columbia, Missouri on Friday

night, crash at Bob Lerch's house and get an early start on the 1st. I was actually pretty relieved when Bob said his departure time probably would be closer to noon. I honestly needed more time to pack and knew any extra time spent with Speigel the Beagle would be appreciated by both of us. She's got serious separation anxiety. Like her name, she came that way and that's just the way it is.

It was after 2:00 p.m. when we finally left Columbia on our way to the Bighorns. I had planned to snooze through Nebraska. I remembered it being one of

the most boring states to drive through from our family trip to The Grand Canyon when I was seven. I was relieved to hear we were going through Iowa and then South Dakota. Even Iowa isn't too bad in the summer for a drive. Jam bands and cave talk hour after hour and before we knew it, it was well past midnight. I learned a lot about that part of the country from Bob. It seems like he's been just about everywhere and remembers more than I ever could about the places he's been.

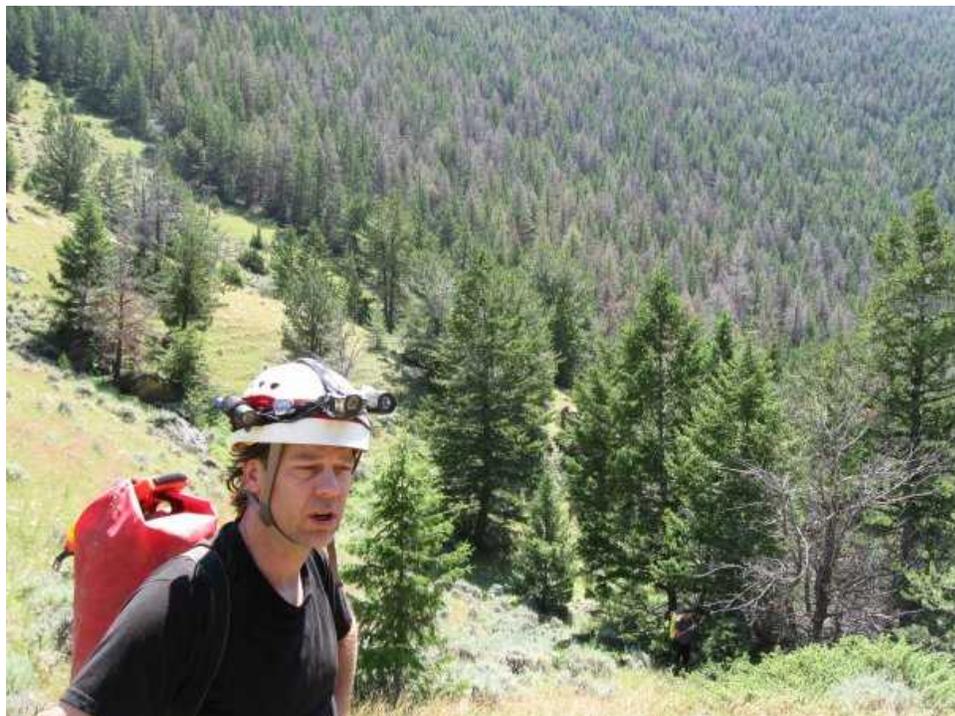
By 4:30 a.m. we were just south of the Black Hills and couldn't keep going due to

Below: The first entrance to P-Bar Cave. Photo by Shawn Williams.



droopy eyelids. We found a campground, set up our tents and crashed hard. We were up and gone by 9:30 a.m. closing on our base camp next to Medicine Creek on the winter game range some 27-or-so miles from the nearest paved road. One last stop in Sheridan for hand lotion, a Snickers and a Dew left me with a funny story.

As I was waiting in line, the bubbly woman with the southern drawl at the counter struck up a conversation with the biker dude behind me. When she asked where he was from, he said, "Ahm frum Lake of the Ozahrks, Missourah!" She said, "Well Ahm frum Steelveel, Missourah" and I said, "Well I'm from St. Louis! It's like a Missourah family



reunion." My Cardinals hat and t-shirt may have been a dead giveaway. We all got a chuckle out of it and as quickly as it happened, it was over and we were out the

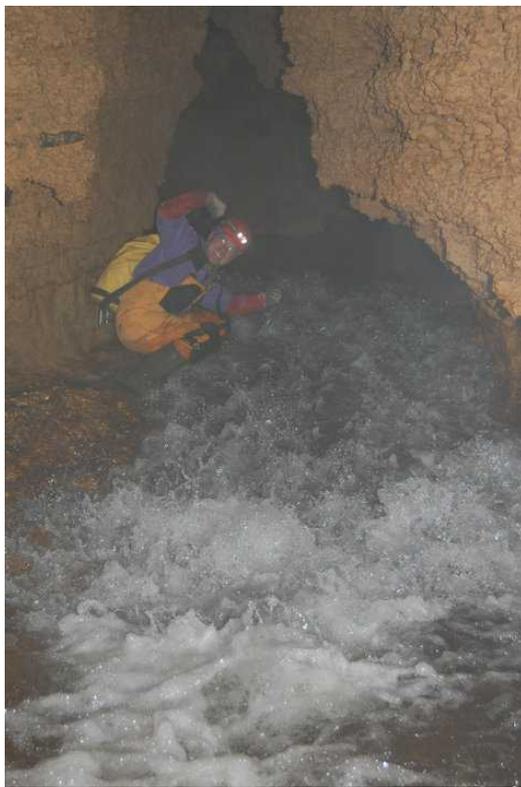
door.

Several thousand feet gained in elevation and several whiplashes later there we were, many miles from the nearest town of Hyattville and nearly 30 miles from pavement. The scents and sounds of the mountains gave me brief pause upon exiting the truck and the view of The Cloud Peak Wilderness in the distance was spectacular adding to the pause.

Double checking the load and deciding to leave the vertical gear at the truck, we started the nearly 1000 foot descent from where the fence prevented us from driving any farther. On game and cattle trails surrounded mostly by sagebrush and occasional deciduous and hardwood trees peppered with huge Madison Lime-

Above: Bob Lerch on the way to the cave. Photo by Ben Miller. **Below:** Cloud Peak Wilderness to the north. Photo by Shawn Williams.





stone boulders we slithered on. The butte on our right with its wooded slopes and sheer limestone cliffs

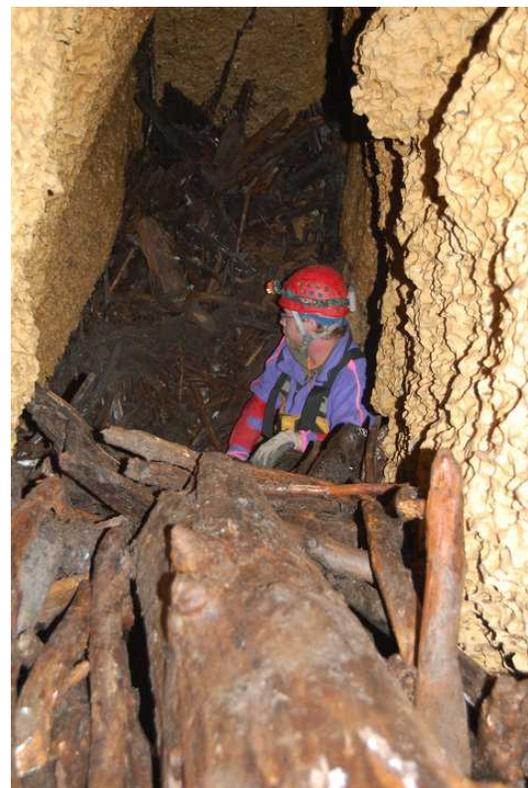
Above: Ben Miller in the rapids of P-Bar Cave. Photo by Shawn Williams. **Below Left:** Bob Lerch and Dan Nalfi in the camp kitchen. **Below Right:** End of the line choke. Photo by Dan Nolfi

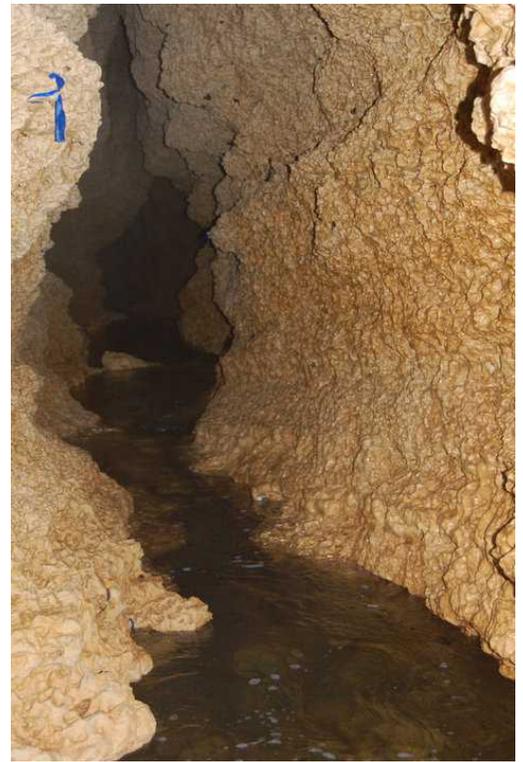
hovered above us and guided our way along its base as we headed into the valley.

What I thought at first was wind whipping through the pines at the base of the valley turned out to be the sound made by the rapids of Medicine Creek which we later found out was way up. Its hissing ebbing and flowing carried on the wind was yet another special introduction to the valley as was the beautiful weather. Toward the bottom of the valley about 30 meters from camp and an hour and half since we had left the truck, I saw what I thought was orange flagging tape attached to a grove of small pine trees. I knew we were close and the GPS coordinates agreed. I

spotted Ben Miller and Dan Nolfi sitting on some rocks between their tents sipping on what looked like a bottle of whiskey. Busted! Cheap, straight Kentucky bourbon.

I've never seen Ben so excited to see anyone! They were beginning to lose hope on us arriving that day, resigned to a Monday of just the two of them in that big cave. Camp was perfect for four people. Any more might prove difficult, the terrain barely conducive to finding enough flat space for our tents between the Aspens and granite boulders. The separate kitchen, dining and campfire area was right next to the stream making access to the water easy and was where we ended up spending most of our time outside of the cave.





Bob and I had decided, perhaps foolishly, before we made the descent that we would return to the truck for another load. We did not know if vertical gear would be needed. Our packs were super-heavy originally. Two trips with lighter packs seemed easier. The terrain was still new enough and the views that spectacular that we didn't mind too much. Before we got too settled, we were off up the mountain for round number two of loading more gear in our packs and heading back to camp.

By the time we returned, it was officially backwoods happy hour! The bartenders were serving bourbon,

Above Left: Giant cephalopod fossil in the sandstone layer. Photo by Ben Miller. **Above Right:** The lower part of the cave all looks like this. Photo by Shawn Williams. **Right:** The sandstone layer. Photo by Shawn Williams.

tequila and scotch. I think I had one shot of bourbon, ate my freeze-dried Mountain House pasta primavera out of a bag and was on my Thermoarest early. 5 hours of sleep the night before, a day of strenuous hiking and backpacking plus the thinner air had beaten me down!

The din of the mountain

stream washed away the thoughts of being eaten by a grizzly bear in my sleep (mostly) but the excitement of my first alpine cave the next day quarreled with my exhaustion. It could've been a better nights sleep, but I was not complaining. One of the things I love about caving



with Ben and Bob is that there is rarely, if ever, a sense of urgency. That especially rang true on this trip. We were, after all, literally in the middle of nowhere, far from anyone or anything that resembled or required a schedule.

After loads of coffee and the first of many backwoods breakfasts, we crossed the creek and made our way to the cave, about a quarter mile hike from camp. Ben and Dan showed us the first entrance where they had begun sketching the new map, then to the second entrance where they were to pick up the sketch.

The hydrology and geology of this little slice of The Bighorns is on a huge, complicated scale. Cave systems of the area often take in huge amounts of water, release



some of it downstream as springs in the main creek bed and pirate some of it for themselves. The main resurgence for P-Bar Cave is some 6 miles from the first entrance. We would get nowhere near seeing the re-

Above: Looking west toward the entrance to P-Bar Cave. Photo by Ben Miller. **Below:** The view from the camp kitchen. Photo by Shawn Williams.

surgence on this trip.

Bob and I searched for the third entrance, also known as the Skylight entrance for awhile before we found it. Finding the first spring hinted that we'd gone too far. We set our sights higher and back upstream eventually finding and negotiating the complex breakdown series that characterized the huge room of this entrance. The single biggest piece of breakdown I've ever seen in a cave actually takes up most of the room. It hugs close to the east side of the room with the west side of the huge piece dropping off into the fading daylight, down into the darkness toward the now swollen, roaring stream.





Above: Velcro rock everywhere! Shawn Williams is stuck to the rock. Photo by Dan Nolfi.

After hours of survey we could see Dan and Ben emerge from under the sandstone ledge that separated the Skylight room from the second entrance sequence where the five foot long Cephalopod fossil was discovered. This sandstone layer is a major player in the development of the cave and

is the site of many nautiloid fossils of all shapes and sizes. We lunched near the stream bed next to the spot where I found the beaver jaw, compared notes and readied for the noisy continuation of the survey that was to follow the water into the depths of the cave.

Subsequent days in the

cave introduced us to the fast water and deep pools, more massive amounts of flood debris, the Velcro rock that the cave is known for, the bypass passage and eventually the reason we had to call the survey. Robin arrived solo on her way to Cali in time to spend day three with us in the cave bringing the team to 5. By her arrival, we had finished the mainstream passage to where the bypass intersected. We finished the tie-in of the bypass by breaking through a wall of flood debris at the end of the wall leading down and almost directly west of the Skylight entrance.

The original map came nowhere near illustrating the actual layout of this part of the cave. Noticeably absent in the bypass was flowing water. There was far less flood debris and far more cold wind blowing, especially in the constricted sections. Inactivity bred chills. The long shots and extra person made fairly quick work of the map work so we were now back to the main passage which was loud, dangerous and challenging.

While clinging to the Velcro rock to avoid falling into the stream and either being swept away or sucked under into one of the plunge pools, Bob and I continued to use the survey dance we had to invent while still in the Skylight Room. With hand ges-

tures and head movements to illustrate, illuminate and confirm the numbers on our fingers for the footage, compass and clinometer readings, we probably resembled some sort of weird Vogue-ing dance crew. It worked very well and we logged a good amount of footage on day four.

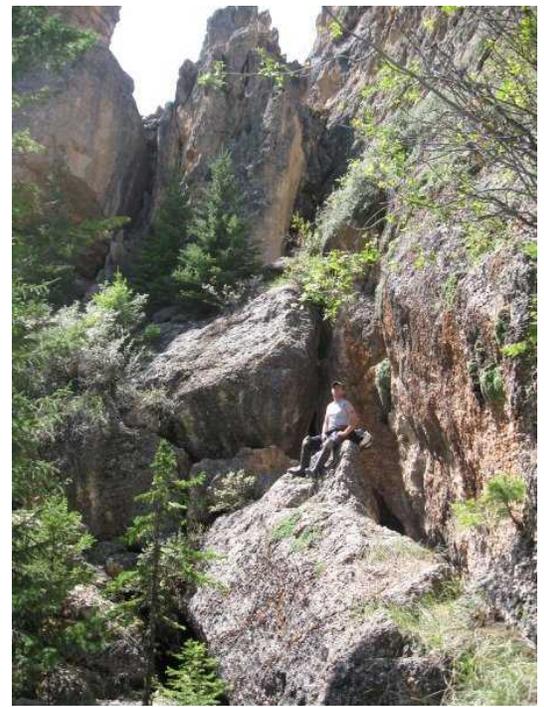
Day five and without Robin it was decided that we would stay above-ground and drive to a little lodge we had seen on the drive up the mountain range. I was craving a burger, thinking I might be able to find one composed of bison. I also hoped to be able to wash it down with multiple beers. We carted some trash out along with any extra clothing that we wouldn't need and were at

the truck in no time.

The mandatory noon-ish happy hour beer drinking session ensued so we got to the descent eventually, though not as early as we had maybe hoped. An annoying thing happened on the way to the lodge. We kept getting stuck behind a truck towing a large trailer. The one-lane road and the drivers inability or unwillingness to let us pass resulted in the mission being aborted. On the bright side, we did see a huge bull moose with equally impressive antlers on the way back and we were also lucky enough to hike to and sit at the entrance to Great-X cave, one of the more well-known caves of the area.

After returning to camp,

Above Right: The third and highest entrance. Photo by Ben Miller. **Below:** The lower stream passage. Photo by Ben Miller.



Ben, Bob and I decided to hike toward Bighorn Basin to take in the sights. The karst features were amazing, the geology varied, the terrain challenging resulting in Bob calling the hike shortly after we started. Pain incurred from a past war wound meant better safe than not in the middle of nowhere.

The next day, deep in the cave, Ben and Dan leapfrogged our team. Shortly after that we learned that there had been a choke discovered. The water was too swift to pass below and the flood debris and cobble that they had been digging through was now meant for our team. Dan and Ben had been digging near the ceiling but Bob and I decided that it made more sense to dig slightly below that where the passage belled out.



There was enough airflow even through the tightly packed debris to keep our enthusiasm up. There was only enough room for one person at a time to dislodge debris and pass it to the other so they could toss it down the slope or into the stream. A frightening, ever present thought lingered in my head about the amount of water that regularly flowed through this system and how much and how large the debris was that it carried. Couple that with the fear of the whole choke suddenly giving way under our feet made for some anxious feelings.

We were, after all, at the top of the passage dislodging granite cobbles, some the size of bowling balls. A flood occurrence here would result

in death. This would be absolute. You will drown. You will be cut to shreds by the Swiss cheese rocks on your way to a choke or impasse. Should you pass through a choke like a meal in an intestine on your way to the treatment plant, you will be subsequently ground to a polenta-like mash by the cobble, sticks, logs and various other flora and fauna parts that once made their living above ground in the warmth of the sun or chill of the bitter Bighorn winter and had now made their way here.

We grew tired and made the decision to leave the mess for the next trip. We straddled the stream, chimneyed up the waterfalls and crawled through the choke holes on our final exit of the

trip with a sense of both frustration and exultation. We had accomplished a huge amount but didn't get as far into the cave as we had hoped. No one was complaining though! Instead of taking the same route we took to get to P-Bar, we instead decided to four-wheel it outta there. Dan flew solo in the rental car because he had an earlier flight out of Salt Lake City leaving Bob, Ben and myself. Two up front and one, me, in the extended cab.

The one time I had been four-wheeling in my life was on the way to Johnson Shut In's State Park in south-central Missouri when I was in my teens. We bounced up one of the St. Francis mountains in the new Jeep and found, of all things, an old still. Down we bounced and went to the shut-in's for a day of swimming. Four-wheeling in the Bighorns is a whole different experience. The view from the back of the extended cab was great! It was almost too good. At times, the sheerness of the downhill slope caused me to close my eyes. The ruts and boulders in the road, if one could call it a road, were enough to make me grimace and grip the seats even more.

I remember Ben asking me how I was doing and I replied that my knuckles had never, ever been as white as they were right then. I

Below: The valley of the P-Bar Cave. Photo by Ben Miller.



thought we were going to die!!! I was propped on my Thermarest, so that being thrown about wasn't bad. I had enough padding. It was the steepness that kept me on the verge of pissing myself. We made it to the park at the bottom of the range and I think we all let out a collective sigh. I know mine was the loudest! The sights were fantastic and the travel time we saved was huge but I was really, really, really glad that that part of the journey was over!

We spent the better part of an hour checking out the hieroglyphs on the sandstone wall and eventually began making our way to the site of what is claimed to be the world's largest above ground hot springs -- Thermopolis, Wyoming. We settled in an

Below: A nice rack! Photo by Ben Miller.

art deco hotel that was reasonably priced and was built as apartments originally. It had a nice pool in the courtyard and a waterfall hot tub with the natural hot springs water piped in.

We had a few cocktails and mingled with some interesting folks. I really enjoyed my first time basking in a hot spring. The next day we spent in and around the hot springs. The supposed largest above-ground flow stone and the actual springs themselves were the high-lights. Ben and I did have to get to Salt Lake City to catch our flights and Bob was to meet his wife and son to continue his vacation so our time was unfortunately limited.

We definitely got to see some of the many faces of Wyoming. Sprawling mountain vistas and long, flat stretches in the basin eventually led us to the Wind River Canyon, the bottom of which is where all hell broke loose. At least the wheel did. Ben was driving this stretch of the canyon and we kept hearing a strange sound coming from the back of the truck. We all got out, looked for the source of the noise, kicked the tires but found nothing out of sorts.

At the bottom of the canyon, the truck started to shimmy, there was a loud crack and the next thing we saw was the wheel flying

past the driver side window, bouncing into the oncoming traffic lane before coming to a rest in the ditch many yards in front of our stunned faces. Had there been oncoming traffic, as there had been during most of our decent through that valley, someone or something would have most likely been seriously injured or even eliminated. While simultaneously scratching our heads and saying "WTF?" while being utterly flabbergasted that no one was hurt, we proceeded to figure out how in the hell to fix this problem in time to get us to the airport the following day.

We eventually phoned a wrecker to transport us and the injured truck to Riverton where we found another affordable hotel to wait out the repair. We were still unaware whether we'd make our flights. The good news was that we got word early the next day that the truck was fixed and that we should be in Salt Lake City in plenty of time to catch our flights. The bad news is that I'm still paying Bob back for all the unexpected expenses we incurred! I guess you can't put a price on life. There are so many scenarios that could have occurred that wouldn't have been in our favor, or in the favor of the vehicle that got hit head-on by a runaway truck tire. Remember boys and girls: SAFETY FIRST!!!



Gating Flippen Cave. November 2011. Article by Jim Cooley. Photos by many people.

Background

In the fall of 2010, Dr. Michael & Mrs. Rebecca Vierra contacted the Missouri Department of Conservation (MDC) concerning Flippen Cave, a locally well known cave located on their recently

purchased 120-acre ranch in western Benton County, Missouri. This cave is marked on the U.S. Geological Survey 7.5 minute KNOBBY topographic quadrangle map and has been known to the Missouri Speleological Sur-

vey (MSS) since 1957 under accession number BEN-009. The cave was surveyed and mapped by Hawksley and Reynolds in that year. The Vierras were curious about the fauna in their cave and also concerned about trespassers who seemed to visit the cave frequently.

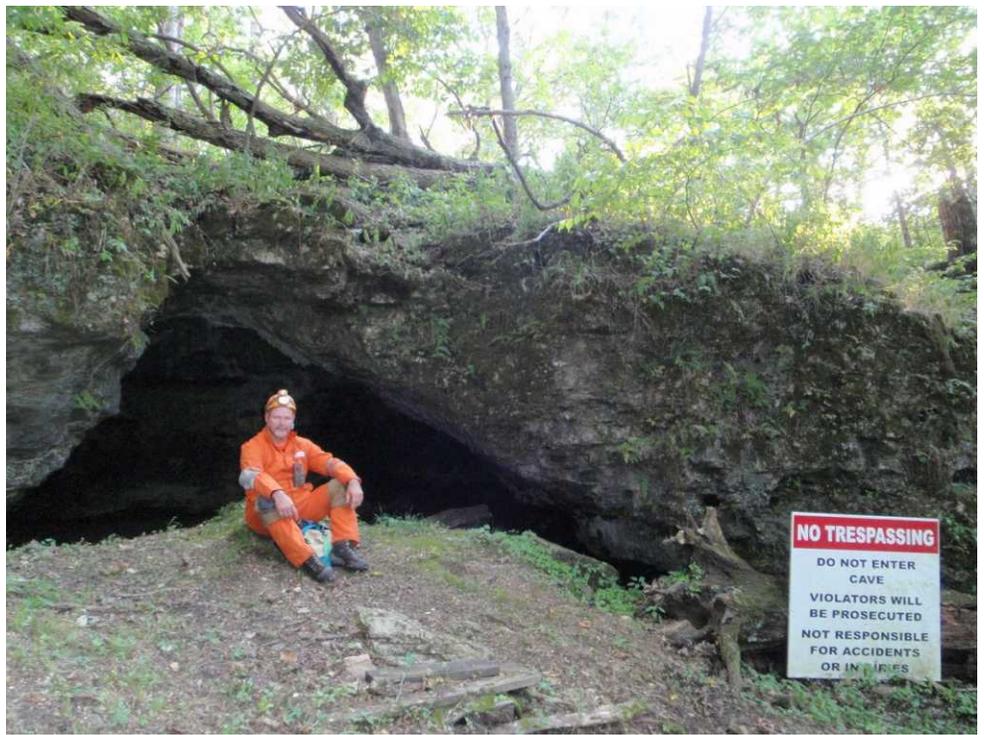
Below: The entrance to Flippen Cave before the gate was constructed. Photo by Pic Walenta.



On October 14th, 2010, MDC Resource Scientist and Cave Biologist Bill Elliott and his assistant, Biologist Shelly Colatskie, visited the Vierras and examined the cave, the right fork of which contains a low-flow stream passage that resurges at the entrance as an intermittent spring. Elliott and Colatskie noted strong signs of an active gray bat (*Myotis grisescens*) colony, which species is on both the Federal and State endangered species lists, and positively identified a single male member of that species. They also noted a diversity of other troglophilic and stygobitic species, including a cave salamander (*Eurycea lucifuga*) and aquatic isopods.

Elliott and Colatskie confirmed that the cave suffers from year-round, repeated archeological looting by vandals, which in turn must negatively impact the gray bat colony, although the cave had surprisingly little graffiti. Repeated confiscation of looting tools and screens and extensive NO TRESPASSING signage had failed to deter illegal activities. Reluctantly, the landowners and MDC concluded that a Bat Conservation International (BCI)-standard, bat-friendly cave gate was needed to protect this resource.

With their permission, the MDC referred the Vierras to Jim Cooley, President of the Kansas City Area Grotto



Above: This sign was just not doing the job. More positive measures were called for. Photo by Pic Walenta.

(KCAG), a Director of the Missouri Speleological Survey (MSS) and editor of its journal *Missouri Speleology*, and a Fellow of the Cave Research Foundation (CRF).

Elliott had trained Cooley and other members of the KCAG in cave gate design and construction techniques during the Sixth National Cave Gating Seminar, run by Jim “Crash” Kennedy of Bat Conservation International (BCI) and held in St. Louis at Cliff Cave, October 5th through 16th, 2009. Cooley had subsequently served as logistics manager for the Round Spring Caverns (SHN-002) regating project, a show cave owned by the National Park Service, U.S Department of the Interior, in Shannon County, Missouri (August,

2009), and as project manager for the Kelly Hollow Cave (ORE-007) gating project (June, 2010), a remote Mark Twain National Forest (MTNF) cave in Oregon County, Missouri owned by the U.S. Forest Service.

Cooley contacted the Vierras and on June 11, 2011, Cooley and Pic Walenta met with the Vierras at their farm, assessed the cave entrance and surrounding area for logistical concerns, and measured the entrance for a gate. Cooley then designed a full enclosure bat-friendly cave gate according to BCI standards. The Flippen Cave gate would be roughly one-fourth the size of the Kelly Hollow Cave project, which was 10 feet high by 52 feet wide, and was erected in five

days. Gating Flippen Cave would require 4,208 pounds (2.1 tons) of steel, estimated to cost about \$2,310.00.

Cooley and Walenta returned to the Vierras' farm on July 31, 2011 to present the plans for the cave gate. Also during that visit, at the behest of the MDC, Cooley and Walenta entered the cave and verified the presence of a significant number of clustered, colonial bats, counting what appeared to be between 500 and 800 individuals, presumably mostly gray bats. The bat count was calculated using a standard ceiling roost clustering density of 170 bats per square foot. A small cluster of about 60 bats was noted toward the back in the right (stream) passage, with the rest in the final human-accessible room in this passage.

At the July 31st meeting, the Vierras gave permission for the cave to be gated, provided suitable funding sources could be located and only under the conditions that they did not have to sign anything or give up any property rights to their farm or their cave. Cooley told them that, given the significance of this endangered species site, these conditions probably would not present a problem.

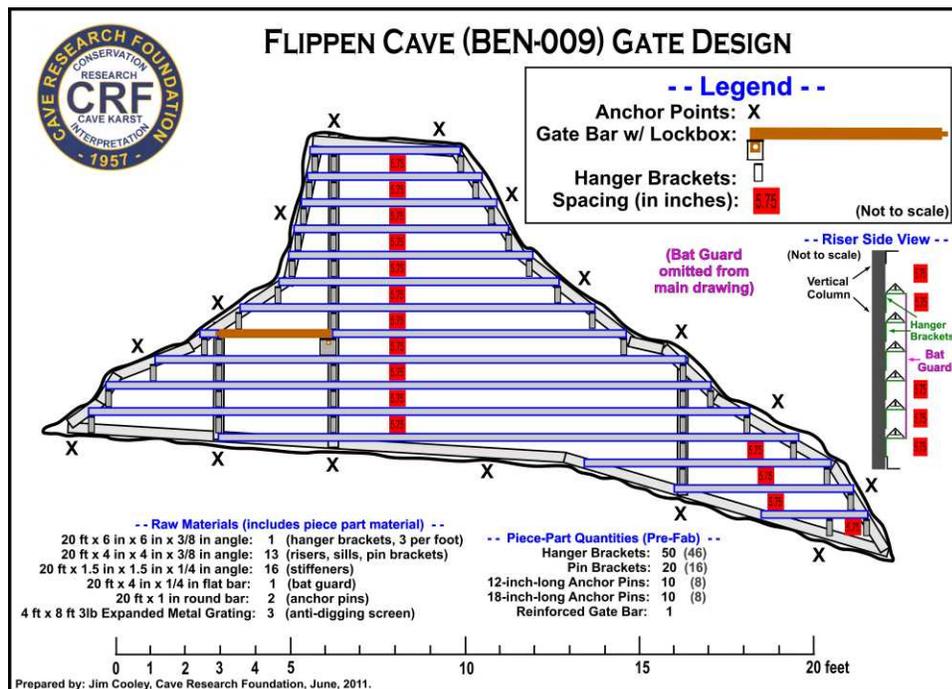
After this meeting, Cooley contacted Jon Beard, former long-serving president of the Springfield Plateau Grotto

(SPG) and Missouri's foremost cave restoration specialist, himself an experienced and accomplished cave gater. Beard also serves as the Vice President of the Missouri Caves and Karst Conservancy (MCKC), a 501c3 corporation that owns caves in Missouri and manages others for their private landowners. Beard noted that SPG has a sizable fund available for preservation of caves with significant biological diversity. Cooley and Beard agreed that Flippen Cave qualified under this rubric, so Beard presented the Flippen Cave gating proposal at the next regular SPG business meeting, held September 14, 2011. This grotto voted a \$1,000 grant

toward gating Flippen Cave.

At the September 18th meeting of the MCKC Board of Directors, Cooley and Beard presented the Flippen Cave gating project and requested funding. Despite some misgivings that no binding legal framework could be had with the Vierras to guarantee access to the cave, in the end the MCKC elected to trust in the landowners stated good intentions. A majority voted to provide up to \$2,000 to underwrite the project. Lastly, Dr. Elliott of the MDC had notified Cooley that there was a Cave Preservation Fund at the Missouri Conservation Heritage Foundation (MCHF) that had been created for just this kind of situ-

Below: The original gate design. In the event this design was heavily modified due to the skid-steer work which filled in the notch in the lower right. Graphic design by Jim Cooley.



ation. Cooley wrote up a formal proposal, specifically stipulating the funds from all funding sources would be expended at an equal dollar-per-dollar rate, and that any monies left over after the caving project would be refunded to the granting agencies. Elliott expedited the proposal through the MDC and MCHF approval process, recommending an additional \$1,500 to underwrite the project. On October 11, 2011, Rick Thom, Executive Vice-President of the MCHF, notified Elliott that the grant request had been approved. The funds were now in place to gate Flippen Cave.

Planning, Preparation and Site Assessments

As soon as the Vierras gave permission to gate the cave, Cooley began locating the equipment and recruiting the volunteers that would be

necessary to complete the project, and solicited bids for the steel. A spreadsheet was prepared to track equipment, materials, personnel and expenses, written directions were prepared to the cave entrance, and a liability waiver was customized for the project, specifically to cover construction activities. A formal project plan was developed, culminating in an illustrated recruitment letter describing the project and soliciting assistance. As an inducement, volunteers were promised “three frighteningly delicious, superbly prepared hot meals daily,” cooked and served on site by KCAG’s Master Field Chef, Pic Walenta.

This plan proposed that construction run from Thursday, November 3 through Sunday, November 6. An advance team would

arrive on site Wednesday, November 2nd, to establish a base camp, set up latrines, set up a metal-cutting station, deliver equipment and materials, and address other construction requirements. Actual construction would begin Thursday, November 3rd, in order to be completed by sundown, Sunday, November 6th. A small crew would strike camp and clean up the work area on the subsequent Monday. Cavers volunteering to gate the cave were offered the opportunity to participate in a monitoring/biological species inventory during the course of the cave gating project. Those interested were advised to bring their thoroughly decontaminated caving gear with them to the project site.

Experienced gating volunteers from all corners of the State of Missouri with a variety of professional and construction skills promptly stepped forward. CRF and MCKC pledged use of their specialized cave gate building tools. The MCKC had owned an electric generator suitable for running the arc welder that would be required to weld the gate together, but this unit had experienced a catastrophic, unrecoverable failure several



Left: A cluster of Myotines in the back room of Flippen Cave. Photo by Jim Cooley.



Above: Test pits were dug during the archeological assessment. Photo by Craig Williams.

years before.

The MCKC scrambled an on-line meeting of the Board of Directors to expedite approval for the purchase of a brand new 8,000-watt electrical generator. This generator was purchased by Klaus Leidenfrost and George Bilbrey in time for gating Flippen Cave. MCKC also donated the use of a heavy-duty Bosch hammer drill for setting anchor pins and making slight modifications to the rock at the entrance of the cave. CRF supplied carrying straps, gloves, protective gear, grinders and long, heavy duty power cords suitable for driving an arc welder. Cooley purchased welding rod and gases for cutting metal (oxygen and acetylene) from Airgas Industrial

Supply in Kansas City, Kansas, where Cave Research Foundation has an account under his name.

Because of extensive archeological looting by vandals at the entrance of the cave, an archeological assessment was indicated prior to construction. On September 10, 2011, Cooley visited the cave with Craig Williams, a professional archeologist who is also a principal of the Cave Archeology Investigation and Research Network (CAIRN), a volunteer group of speleoarcheologists. Williams agreed to donate his time and expertise to the project. Williams and Cooley dug sample pits at the proposed location of the gate to assess the nature of the archeological resources at the

site. In Williams' opinion, the entrance to the gate was a very low-significance archeological site, in spite of its repeated targeting by looters, which finding was consistent with the presence of much better springs (and therefore better habitation sites) nearby in the valley. There would be no archeological objection to disturbing the ground to erect a gate.

Once funding became available, Cooley purchased a preliminary quantity of steel on Monday, October 24th, 2011 from Sedalia Steel Supply, the low-bid supplier for all steel used in the project. The vendor had to cut the 20-foot lengths of steel into shorter sections to facilitate transportation on Cooley's small, eight-foot-long All Terrain Vehicle (ATV) trailer to Blue Springs, Missouri.

There, this steel was cut into piece parts – hanger brackets, pin brackets, and anchor pins – required for gate construction, in the metal shop of Calibrated Products, Inc., a hydraulics company specializing in manufacturing and refurbishing heavy railroad equipment, whose owner, Rick Riddle, is a friend of conservation. In addition to donating shop time and supplies, Riddle had his highly skilled welder fabricate a gate bar with tang according to BCI-standard specifications.



Above: The beavers threw up a (dam) roadblock! The cave can be partly seen in the background. Photo by Jim Cooley.

Riddle also donated his employee's labor. Meanwhile, Master Chef Walenta prepared a menu and began hitting the sales, purchasing food for the project.

Joe Williams, a Missouri caver who in the recent past has constructed over a hundred and fifty cave gates in the Mojave Desert, and who therefore served as construction expert on this project, suggested to Cooley that a better, more robust and difficult to defeat gate could be

built on level ground closer to the underlying bedrock. Cooley contacted Larry Knox of Knox Construction, Warsaw, Missouri, a known provider of quality backhoe and bobcat work that Cooley had used twice before.

Cooley and Knox visited the gate site to determine if heavy equipment could be brought to the site to level the entrance area, and if so, to prepare a bid. As this work

proved feasible, and the cost was reasonable, Cooley contracted with Knox to do site preparation with the bobcat, as well as to return after the gate was built to spread a thick mantle of dirt over the expanded-metal anti-digging screen, then further secure it with large rocks.

In the weeks preceding construction, Cooley delivered steel gate piece parts, oxygen and acetylene cutting

Right: A collection of CRF and MCKC cave gating tools staged at the cutting station. **Below Right:** Piece parts including hanger brackets, anchor brackets and anchor pins. Both photos by Bill Gee.

gases, welding rod, a large tent and tables for the field kitchen, a portable toilet, water coolers, and other equipment to the campsite, which was located just off R Ranch Road about 370 yards from the cave entrance. These materials were hidden in the woods, out of sight of the road. The Vierras mowed the campsite field the week before the construction team arrived.

On October 31, 2011, Cooley traveled to the cave once again to meet Knox. The cave entrance was prepared and leveled according to specifications using Knox's bobcat. Both participants were surprised to discover that in the preceding month a sizable beaver (*Castor canadensis*) dam had been constructed directly in front of the cave, astride the trail that led up to the entrance. Knox attempted to knock the edges off of the stream bank directly in front of the beaver dam to create a direct, vehicle-traversable road to the cave entrance. This effort failed due to the depth and softness of the mud in the creek bed. (The bobcat was not a tracked vehicle.)

Fortunately, the landowner had already cut a road around the side of the ridge



that led to the top of the cave, which allowed ATV traffic and the bobcat access to the cave entrance. Using the bobcat, Knox reduced and leveled the large mound of dirt and archeological looting spoil in the entrance of the cave, then filled and secured the tight creek passage on the right side (as you face into the cave) of the entrance with large rocks, to

stabilize the dirt overfill and provide a solid footing for that end of the gate. This bobcat work required two hours of billable machine time.

At the conclusion of this bobcat work, Cooley drove on to Shannon County, Missouri and collected the bulk of the CRF and MCKC cave gating tools, metal cutting benches and other gear. After





spending the night there, Cooley continued on to Rolla, where he picked up the new MCKC generator from Klaus Leidenfrost, then proceeded back to Flippen Cave, arriving on the afternoon of Wednesday, November 2nd. At this point, rain was threatening. This last journey to collect tools and gear (calculated as a round-trip from Kansas City) required 834.2 miles of driving, at a gasoline cost of 23.3 cents a mile for the E250 van pulling an ATV trailer.

Shortly after Cooley arrived at the campsite, Williams showed up, right on schedule. Work began to set up the work areas and camping area. The Vierras had graciously donated use of

their Ranger, a six-seater ATV with a tilt bed on the back that proved invaluable. The Vierras further offered the construction crew use of their large tractor, which in the event was not required. A short while later, Colatskie arrived, as did Bill Gee, former president of the Kansas City Area Grotto and current editor of the grotto newsletter, *The Guano*.

After personal tents were pitched, the group delivered the cutting gases, cutting benches and cutting heads and tools to the area established for custom cutting the gate bar steel, which was about 70 yards below the cave. Piece parts, the prefabricated entry bar, and other tools were deposited at the cave mouth, and the generator, power cords and containers of gasoline were placed above the cave, where the noise of the generator running would not drive the construction crew crazy or render them deaf. A couple of loads of firewood were cut and driven to the campsite in the Ranger, where they were dumped at the site of the planned campfire.

By now it had grown dark – time for bat fly-out! Colatskie deployed an “anabat detector,” an electronic listening device capable of detecting the echolocation cries of flying bats, to assess the number bats flying out of the cave. Construction dates

Above: Shelly Colatskie and the anabat detector. **Below:** The "circus tent" field kitchen with the two chefs extraordinaire, Brandy Riggs (left) and Pic Walenta. Both photos by Jim Cooley.





Left: Preparing to unload the steel truck. Left to right - George Billbrey, Shelly Colatskie, Bill Gee and Joe Williams. The man on the truck is the driver, name unknown. **Below Right:** Stacking steel just off the road. The kitchen tent is in the background. Both photos by Jim Cooley.

had been chosen to avoid disturbing colonial bats. Thanks to the presence of an MDC bat biologist on the volunteer crew, a quick, non-invasive method was available to conduct a census. Colatskie easily confirmed that very few bats were exiting the cave.

Lastly, the crew erected what was lovingly referred to as the “circus tent,” donated to the project caving community by Philip and Carolyn Johnson of Shell Knob, Missouri. This sizable, robust structure served as the field kitchen for the project and community gathering place in case of rain – but was a major challenge to erect with only four pairs of hands.

The “circus tent” went up just as rain began to fall in earnest, preempting the campfire that night. At this

point everyone went to bed, where they listened to rain pitter-pattering almost until dawn. The area received a serious soaking as a front moved through and temperatures dropped, creating concerns about rutting up

the landowners’ fields with vehicles. Subsequent arrivals were directed to park along the road. A decision was made to close the road above and around the cave to the Ranger to prevent damage to the trail, at least until the ground dried out.

Day One: Construction begins

Everyone was up at dawn on Thursday, November 3rd. Cooley prepared a breakfast of sausage and eggs. George Billbrey arrived up just as breakfast was completed, and set about pitching his tent. Cooley had enlisted 18 volunteers for the project, 17 confirmed and one maybe,



including 15 steel handlers and gate builders plus three folks to prepare and serve hot meals. In the event, three confirmed volunteers bailed (no-showed), the “maybe” had to work and couldn’t make it, one volunteer fell sick, and one confirmed volunteer who wasn’t scheduled to arrive until the weekend was waved off when work ran slightly ahead of schedule and his help was not urgently required. In effect, the project was completed more or less comfortably with 66% of the budgeted labor, utilizing up to ten construction personnel and two cooks. Thursday

Right: The secret to hauling long pieces of steel is to tie it only at the front of the trailer. Photo by Pic Walenta. **Below:** Joe Williams and Bill Gee work on "flatrocking" the stream crossing. Photo by Jim Cooley.

morning was the only time that personnel shortages cramped the project. As Colatskie had to leave at 10:00 a.m., there was a shortage of laborers to unload the steel.

Shortly after 9:00 a.m. a 25-foot flatbed came up the road carrying not only our two tons of steel, but eight

tons of two other customers’ steel as well. Before he could be stopped, the driver had turned and begun to pull into the field. As soon as the truck turned, it lost all front-end traction and abruptly slid a good three feet to the left in the mud. The driver slammed on the brakes. For-



tunately, the rear (drive) wheels of the flatbed were still on the county road. The driver was able to carefully nurse the truck back out of the field without getting hopelessly stuck, or creating huge ruts in the field – though it was a near thing. The truck had to be unloaded in the county road. If it had not rained, the plan was for this vehicle deliver the steel across the property 300 yards to the metal cutting station. In the event, steel had to be unloaded and



Above: George Bilbrey prepares the generator for the day. Notice the level on top. Photo by Bill Gee. **Below:** Bill Gee manually levels out the floor beneath the gate location. Photo by Jim Cooley.



stacked in the field beside the road, then handled again later. This location, highly visible from the road, was not the ideal spot for a pile of expensive steel. Fortunately, the cooks were to arrive in the afternoon; they would provide security.

The next order of business was to get enough steel up the hill to the cave to begin construction. To Cooley's

surprise, it proved possible to haul the 20-foot lengths of steel in small quantities on the eight-foot ATV trailer behind the Ranger to the cutting station, by using a technique Williams had learned in the Mojave Desert. (There is just no substitute for experience!) Bilbrey, the electrical generator and welder expert, was sent up to the cave to get the generator

leveled, fueled and fired up, lines run to the cave, and the welder set up and tested. Due to the rain, the creek crossing in front of the beaver dam was running ankle deep. Gee, Williams and Cooley decided to set stepping-stones across the creek, to give everyone at least a fighting chance to keep their feet dry.

Williams, Cooley, Gee and Bilbrey finished leveling and preparing the gate site, and laid down the three-pound expanded metal, so named because a one-foot square weighs three pounds. This material functions as an anti-digging screen, to prevent vandals from burrowing under the gate. Bilbrey fired up the oxyacetylene torch and cut pieces for a sill plate and the risers, which were hauled up the hill by hand. The gate was roughed out by laying a four-inch by four-inch angle iron sill, then welding custom-cut risers to it, made from the same material, on which would eventually hang all the bars of the gate.

Once the bottom two horizontal gate bars had been attached to this assembly, to give it some heft, holes would be drilled in the ceiling of the cave and 12-inch-long, one inch-in-diameter steel anchor pins would be driven deep into the rock. Then, anchor brackets would be fitted and welded to the pins, then welded to the top

Right: George Bilbrey cuts vertical riser pieces while Bill Gee assists. The cave entrance can be seen in the background just above George's head. **Below Right:** Joe Williams welds the third vertical riser in place while Bill Gee protects his eyes. This photo shows the expanded metal base and the bottom sill plate. Both photos by Jim Cooley.

of the framework to secure it. At that point, it would be “broken field running” – hanger brackets could be added all the way up the risers to the ceiling of the cave, with custom-cut gate bars welded in place as fast as they could be cut at the cutting station and hauled up the hill.

Thursday afternoon, Pic Walenta and Brandy Riggs arrived on site with the bulk of the food and finished setting up the field kitchen. The crew at the gate knocked off work just before dark, after which Walenta served the first of her “frighteningly delicious, superbly prepared” hot meals. A roaring bonfire was built against the near-freezing chill that came with nightfall, landowner Michael Vierra came down to join us, and feasting and fine fellowship was enjoyed by all. Later that night, long after the tired, well fed cave gaters had gone to ground, veteran gate builder and accomplished welder Alicia Wallace arrived, pitched her tent, and drifted off, with visions of hanger brackets dancing in her head -- and the sound of logs softly being sawed all



around her.

Day Two: Construction continues

On Friday, November 4th, Cooley arose before dawn, rekindled the campfire, and had the coffee brewed by the time everyone else got up. Once everyone was out of the sack, Walenta and Riggs prepared and served a hearty breakfast. While most of the team ate, Gee went down to the creek with his chainsaw for an orgy of firewood cutting. When Gee returned, the construction crew present – Williams, Gee, Bilbrey, Cooley and Wallace – headed off to the gate site, hauling an increment of steel on the trip which was deposited at the cutting station. The team began setting and welding hanger brackets into place, and drilling the holes to anchor the riser frame.

Later in the morning, Jon Beard of SPG and Bree McMurray, an endangered species biologist with the Missouri Department of Transportation (MODOT), arrived on site and helped Cooley haul the rest of the steel to the cutting station. These three would form the cutting and steel-hauling team, with McMurray doing the cutting and Beard and Cooley doing the measuring, marking and hauling. Meanwhile, Williams, Bilbrey, Gee and Wallace stayed up the hill, where they assembled and welded the gate.



Above: The crew heads off to work. Left to right: Bill Gee, Joe Williams (driving), George Bilbrey, Alicia Wallace, Jim Cooley. Photo by Pic Walenta.

Roy Gold and Charley Young from SPG showed up with photographic gear to conduct photodocumentation of the cave on the date of gate construction. They then pitched in to help with cutting and hauling steel.

En route back to camp for a hot lunch, the fruits of Gee's early morning "busy as a beaver" labor were loaded onto the Ranger and trailer for delivery to camp. Friday afternoon, landowner Rebecca Vierra and her three children came down and visited the cave.

After work ended Friday, McMurray and Beard entered the cave to do the biological diversity assessment that Colatskie did not have time

to complete.

Day Three: Construction Continues

On Saturday, November 5th, Cooley again arose before dawn, rekindled the campfire, and had the coffee brewed by reveille. Walenta and Riggs prepared and served another hot, hearty breakfast, after which the construction crew returned to its labors. Horizontal bars fairly flew up the gate as the entrance crew radioed a continuous stream of measurements down to the cutting station.

Saturday's work drew to a close with much accomplished, and only a little more yet to be done. Since we were clearly on the home stretch, George Bilbrey broke camp and headed for home,

pleased to be able to attend worship services at his church Sunday morning, and justly proud of a job well done. As the team sat down to dinner, the wind picked up substantially, and the air turned chilly. Another front was moving in.

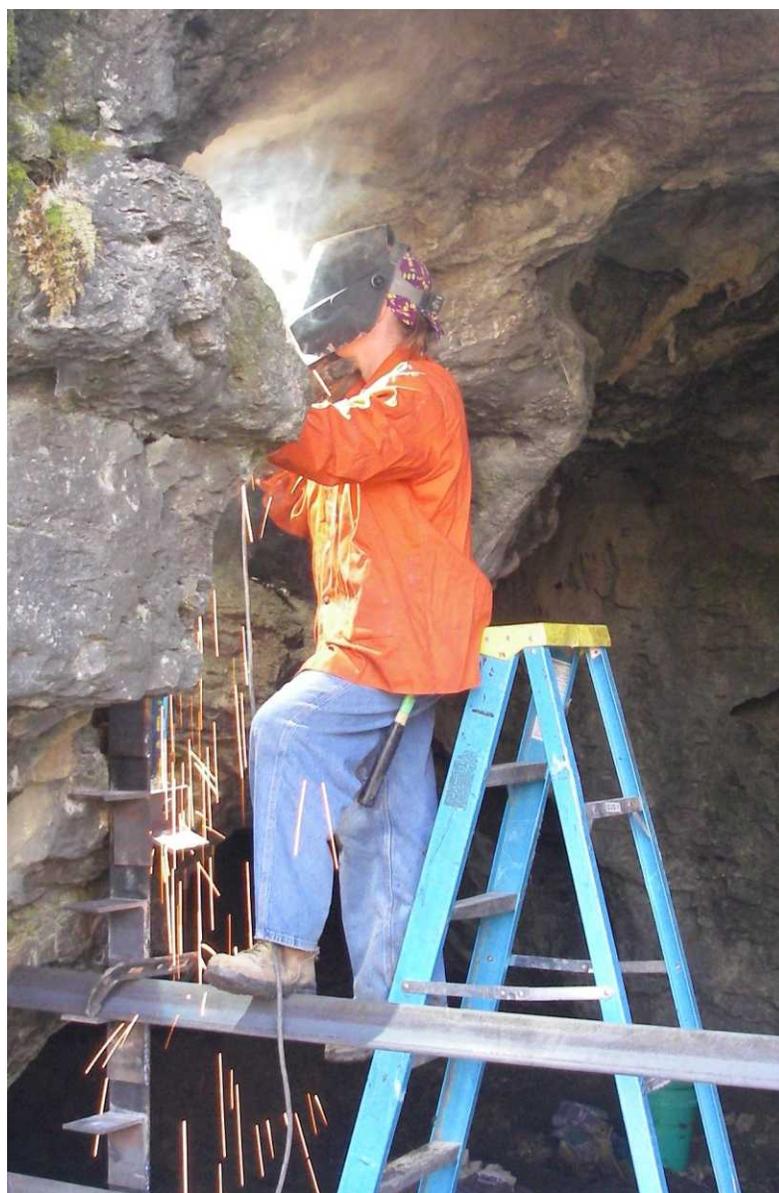
After dinner, some of the crew sat up later than they might have preferred, watching the campfire to make

sure it was very close to out. The Vierras are well into a comprehensive native-species prairie grass restoration program, and the field hosting the campsite was loaded with highly flammable, warm season grasses -- mostly Indian grass. It would not do to leave a fire unattended that might throw an ember as the crew slept, to start a wildfire. Good landowner relations

include not burning down the farm!

Nonetheless, after everyone retired around midnight, leaving only the most meager bed of non-sparking coals, the wind continued to howl. Sometime during the night, Brandy Riggs, in the only tent downwind of the campfire, smelled plastic burning. She leapt out of her tent to find that one of Cooley's folding chairs had been blown over – falling onto the

Two working women. **Below Left:** Bree McMurray cuts steel. Photo by Jim Cooley. **Below Right:** Alicia Wallace welds on one of the risers. Photo by Bill Gee.





Above: Setting a 200 pound length of steel takes a number of people. Left to right: George Bilbrey, Alicia Wallace, Jon Beard, Bill Gee, Joe Williams. Photo by Charlie Young. **Below:** Jon Beard and Jim Cooley carry cut steel pieces up to the cave. Photo by Pic Walenta.

coals! It was not the first time this sort of mishap had happened to this duct-taped survivor, but it would definitely be the last. Riggs watched the last of the plastic burn off the aluminum frame as she folded up the rest of the chairs and laid them on the ground where the wind couldn't budge them. She then returned to her slumbers.

Day Four: Construction Concludes

On Sunday, November 6th, having stayed up late, everyone slept in a bit, except Walenta and Riggs, who were up with the chickens fixing yet another hearty breakfast. Williams, Wallace, Beard, Gee, McMurray, and Cooley were at the gate by 9:00 a.m. working on the last construction steps to be done. None of these tasks was major, but in aggregate they added up. These jobs included creating the lock box, which prevents bolt cut-

ters from being used to snap off the padlock that would hold the gate bar in place; drilling holes and placing the last anchor pins, and welding them into place; welding on the bar guard plates, which help returning echolocating bats see the gate and so avoid running into recessed risers; cutting and welding four-foot-long feet onto the front of the gate, to better hold down the expanded-metal anti-digging screen and to give the gate even more structural rigidity; welding the initials of all the conservation groups who built the gate onto the back side of the gate, and dating it; and giving all the welds on the gate a final, thorough quality control check, which





Above: Hauling a large load of firewood. Chainsaw work and photo by Bill Gee. **Below:** Master field chef Pic Walenta in her demesne. Photo by Jim Cooley.

always turns up a couple of joints that were tacked but never fully welded. When all this was done, Cooley got

down on his back and snapped the padlock in place, verifying the fit. The time was exactly high noon. The construction phase of the project was now complete.

Day Four: Breaking

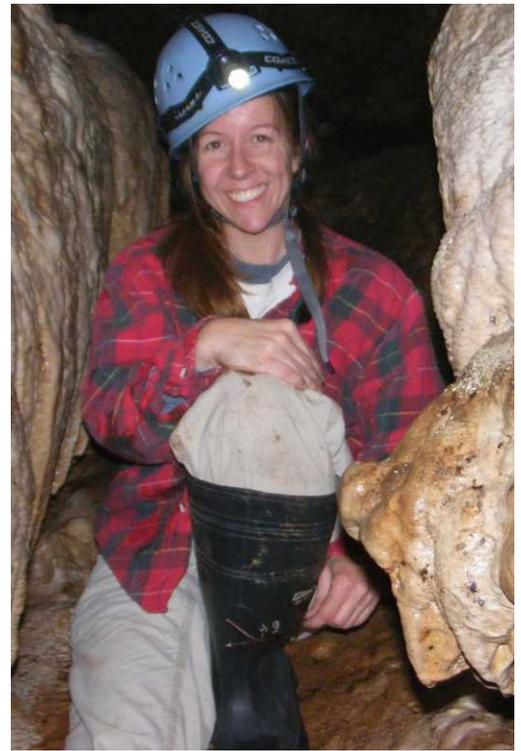


Camp

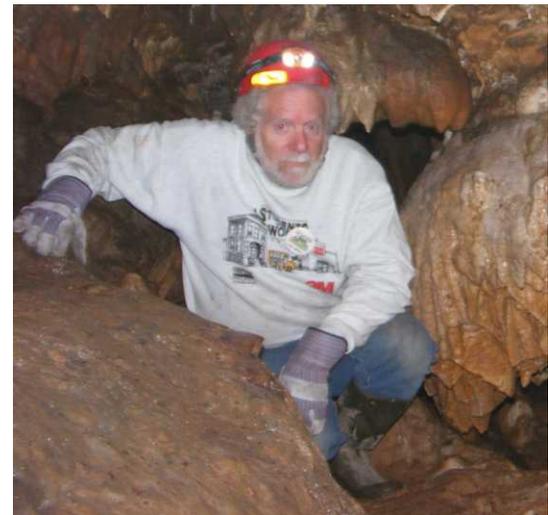
After lunch on Sunday, everyone still remaining on site returned to the gate for photos. Then all hands set to breaking down camp – in a hurry, as rain was threatening. Surprisingly, all the gear was collected, packed, loaded and was ready to roll out of the field where the campsite was located by 3:00 p.m. Left behind were three 20-foot four-inch by four-inch sticks of angle iron, plus four or five 20-foot lengths of the smaller 1.75x1.75 inch angle used as bar stiffener, all of it moved away from the road and hidden in the woods.

The Ranger was returned to the landowners, and all the bagged, unrecyclable trash was deposited at the roadside in front of their house – including one thoroughly cooked folding chair. The last vehicle, Cooley's Batvan and trailer, pulled out of the field just as the first raindrops began to fall. Williams, Walenta and Cooley deposited all the CRF and MCKC construction gear in the shed behind Cooley's cabin, located nine miles away. As her last official act as Camp Chef, Walenta then made Williams and Cooley a frighteningly delicious dinner of superbly prepared leftovers at Cooley's cabin. No one goes hungry on these projects.

Clean-Up and Landscap-



The biota of Flippen Cave. **Top Right:** Bree McMurray (MDC). **Center Right:** Cave Salamander (*Eurycea fucifuga*). **Bottom Right:** Jon Beard (SPG). **Bottom Center:** Tri-color bat (*Perimyotis subflavus*). **Bottom left:** Frog, unknown species. **Top Left:** Big Brown Bat (*Eptesicus fuscus*). All photos by Bree McMurray except top right by Jon Beard.



ing

At noon a week later, on Sunday, November 13, Max White of SPG met Cooley and Walenta at the campsite. White had brought a 25-foot trailer from Springfield to collect the leftover steel, which was donated to SPG. Larry Knox showed up with his bobcat, which he used to pick up and move the heavy bars. After White headed off to Springfield with the steel, Cooley and Knox took the bobcat to the gate and covered the anti-digging screen with dirt. Then Knox used the bobcat to pick up some large boulders that were dug up when the Vier-ras' barn was built on the other end of the property, and brought them down to the cave gate. Knox smoothed the area in front of the cave gate, then headed



Above: Enjoying good company and great food around the campfire after a hard day of cave gating. Photo by Pic Walenta. **Below:** The landowner and children visit the job site and are amused by "Frosty" Gee, covered in limestone dust after drilling anchor pin holes. Left to right" Brianna, Rebecca, Tiffany and Michael Vierra, Bill Gee. Photo by Bree McMurray.

back toward the campsite and covered up the latrine pit he'd dug for the project.

Cavers had collected and bagged all the readily removable cans and bottles at

an old dump next to the campsite in the evenings while waiting for supper, demonstrating yet again a conservation ethic of leaving every cave and campsite better than it was found. Knox took a few minutes to pretty up the dump area with the bobcat. Come next spring, no one will be able to tell that the dump, the bobcat, or the gating crew were ever there. This completed the Flippen Cave gate project – except for the paperwork.

On Thursday, December 8th, Cooley returned all the gear borrowed from the CRF and MCKC to its normal Shannon County, Missouri storage location, along with the new MCKC generator. Bilbrey and Cooley performed scheduled mainten-





Above: Setting a top sill plate. Left to right: Jon Beard, Alicia Wallace, George Bilbrey, Bill Gee, Joe Williams. **Below:** Measuring for a horizontal bar. Left to right: Alicia Wallace, Joe Williams, George Bilbrey, Jim Cooley. Both photos by Bree McMurray.

ance, including an oil change and battery charging, before putting the generator away for the winter. On December 26th the last two bills were paid, a refund check was cut to the MCKC, and the books on the project were closed.

Cost Overruns

When Cooley first presented the project to SPG and MCKC for funding, he estimated that it could be brought in for around \$3,000, although he warned the group that this was a very rough estimate. By the time Cooley applied for the Missouri Conservation Heritage Foundation funds, this estimate had begun to appear unduly optimistic. In the event, the project ended up costing

\$1,288.04 over this original estimate, due primarily to a number of cost overruns. First, the budget for the steel for the project was based on

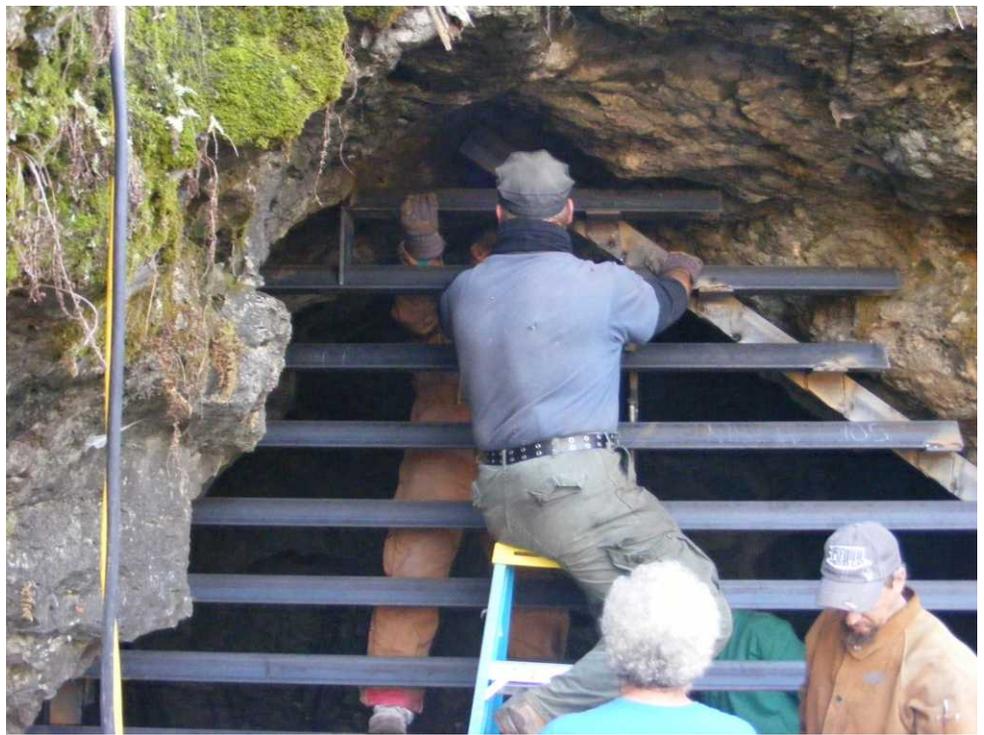
figures from a bid that Sedalia Steel Supply had provided for the McCormick Cave gating – a Forest Service project which required four times as much steel as Flippen Cave gate.

Sedalia Steel Supply did indeed honor these prices on the steel delivered in bulk to the Flippen site. However, they could not honor those prices on the steel that was purchased by Cooley in Sedalia on October 24th to fabricate the piece parts. This steel had to be purchased at retail. Also, the intention had been to buy short pieces of this steel from the “cut rack” at the vendor’s shop, which Cooley could transport to Kansas City on an eight-foot ATV trailer. In the event, however, no steel short enough was available, so Sedalia Steel Supply had to



cut the steel to fit onto the trailer – at \$5.00 a cut.

Second, the original project budget did not include site preparation or finishing with a bobcat. The gate we ended up creating took less time to build, and is much more secure, because of the bobcat work – especially with the final placement of BFRs (big, FINE rocks) over the anti-digging screen. This work added \$300 to the project cost. Third, the steel required for the gate as designed was calculated on the entrance configuration measured before the bobcat work was completed. But the leveling of the entrance area actually made the entrance opening taller, by about a foot – and this at the largest point of the entrance, the bottom. Extra steel had to be added to the order at the last



Above: Topping out the gate. Bill Gee and Jom Cooley set the top horizontal bar. Photo by Bree McMurray. **Below:** This chair made the ultimate sacrifice courtesy of the wind and the fire. Photo by Bill Gee.

minute to accommodate the larger opening, which increased the steel cost on the bulk purchase by \$306.00.

Fourth, when Cooley purchased the piece-part steel,

he completed a verbal “contract” for the balance, which Sedalia Steel Supply promised to deliver to the job site “as early as possible”

Thursday morning, November 3rd. On November 1st, Cooley picked up a phone message from Sedalia Steel Supply, stating that the steel would arrive on Friday instead of Thursday. This was not acceptable. Friday delivery would not be in time to achieve project completion on schedule. Cooley called them back Monday afternoon, and was told that they could not honor their delivery agreement because of the small quantity of steel involved. It was unprofitable for the vendor to go so far out of their way when sever-



al deliveries couldn't be piggy-backed together – as they could be on Friday.

When Cooley insisted that the steel arrive when promised, Sedalia Steel Supply offered to send a special truck to deliver the materials at the agreed upon time – for an extra \$100.00 delivery charge. Caught between a BFR and a hard place, Cooley had to agree to the extra charge. When the truck did arrive Thursday morning as promised (and paid for), it did have loads of steel on it going to two other customers, oddly enough. In any case, there's a moral to this story: Money talks. When all was said and done, the bill at Sedalia Steel Supply, including the delivery charge, was \$490.16 over the original estimate. The delivery charge was cheap insurance to keep

the project on schedule.

Fifth, welding rod cost estimates were based on prices current when the Kelly Hollow Cave gate was built in June, 2010. Prices had gone up. Fifty pounds of welding rod cost \$91.42 then; by the time we built the Flippen Cave gate, 50 pounds of the same stuff (Radnor one-eighth inch 6011) costs \$116.01 – a 27% increase.

Sixth, food proved quite a bit more expensive than budgeted. At the Kelly Hollow Cave gating Walenta fed 286 hot meals to a significantly larger crew for an average cost of \$2.32 a meal; at Flippen we ultimately served 95 hot meals, at a cost of \$4.05 each. Part of this was due to a last-minute spot-buy of vittles Cooley did to feed folks until Walenta showed up, but much of the

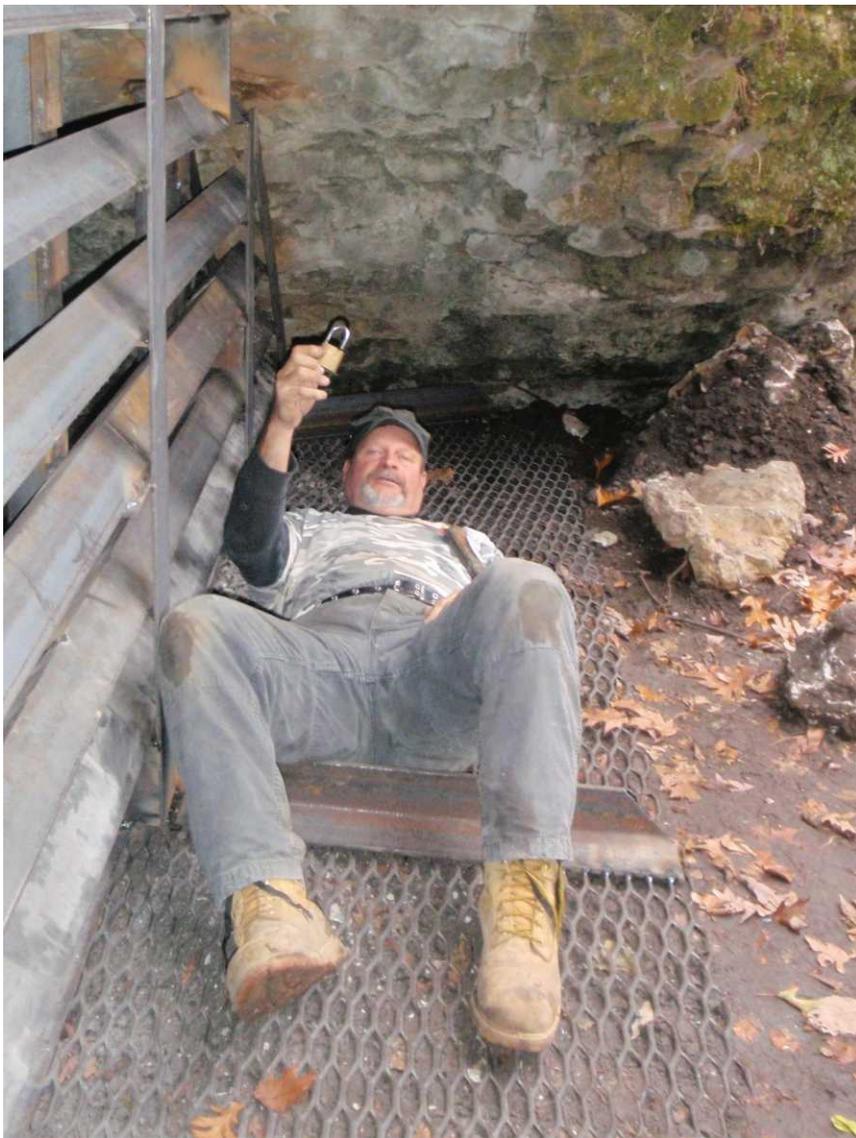
higher per meal cost has to do with meals for no-shows, folks who called in sick and the wave-off – which were not included in the calculation. When all 132 planned meals are included in the calculation, our per meal cost was \$2.91 – still significantly higher than at Kelly Hollow Cave a year and a half before. We knew groceries had gone up. We didn't imagine they'd gone up by 25%.

Conclusions – and Lessons Learned

Ultimately, the Flippen Cave gating project has to be judged a smashing success. We completed the project on time, within the amount of money we had to get it done, without injuries. We all ate like royalty, and everyone had a great time. Virtually everyone who worked on the

Left: Alicia Wallace welding in an uncomfortable position. Joe Williams looks on. **Below:** Alicia Wallace uses a grinder to dress up the lock box. Both photos by Bill Gee.





above, is that these efforts can get expensive. Murphy always shows up on these projects somewhere, and lays down his law. Second, it's a good idea to enroll more folks in the effort than you think you need, and keep track of their statuses. Of the 18 people on the planning spreadsheet for this project, only 66% ultimately participated. The guy that called in sick, the tentative fellow that ultimately had to work and couldn't make it, and the guy we waved off were understandable – but 17% of the confirmed work force just flat didn't show up, or cancelled at the last minute. This is not out of line or surprising on volunteer projects. Some folks just don't get it.

Third, pay attention to who is scheduled when. Our two construction crew no-shows were badly needed

project signed up to help gate McCormick Cave a month later, which unfortunately had to be postponed. Moreover, we left Flippen Cave with a robust, bat-friendly, fine-looking gate.

The landowners were extremely pleased with our work, not to mention the care and concern we showed for their property. Still, there are some things to keep in mind when planning a cave gate. The first and most obvious, discussed at length

Above: Jim Cooley prepares to lock down the project. **Below:** Several organizations contributed to this project. Both photos by Pic Walenta.





Above: The sign should work much better now! Left to right: Bree McMurray, Jim Cooley, Joe Williams, Jon Beard, Alicia Wallace, Pic Walenta. Photo by Jom Cooley.

during the unloading and dispersal of the steel. If we had been short one more person, we'd have been in trouble; two more people short on Thursday would have meant serious trouble.

Fourth, have well thought out contingency plans. The biggest wild card is the weather – but generators also fail, welders burn up, and utility vehicles quit working or otherwise become unavailable. When that happens – what exactly are you going to do, and equally

important, how long will it take you to do it? For this project Cooley secured commitments from various quarters for back-up generators and welders that would have been utilized in the event of major equipment failure, which fortunately were not needed. Having these items prepositioned on site would have been even better.

Fifth – which is related to the fourth point - allow more

time than you'll think will be required to get the project done. We had planned to have the steel delivered to the cutting station, 70 yards from the cave. Because of rain, it had to be dropped on the county road 300 yards further away, and then handled twice. This set-back alone added at least half a day to the project. Worse, it sorely taxed our available human resources. Luckily,

uncooperative weather had been baked into the plan from the beginning.

Sixth, manage your vendors. Welding rod distributors have repeated told Cooley they have “hundreds of pounds” of the required welding rod in stock, namely 1/8th inch 6011 – and then, when the time comes to pick up a hundred pounds or so, they have 20 pounds in stock. The same holds true of welding gases. Your vendor’s day is not ruined when he doesn’t have what he said he had; your whole project could be. Cooley’s policy is to buy as far ahead as is practical, and just eat the cylinder rental on the gases.

Some items – welding rod, for instance – can be over-bought, with the unopened excess returned for credit. Other items – e.g., welding gases – cannot. Timely delivery, as discussed above, is



obviously an issue. We did not have the steel delivered ahead of time due to concerns about theft, and because a bunch of labor was needed to unload it. We won’t do that again. Steel is too important – too much can go wrong at the last minute.

Seventh, buy all the steel at once. To make this possible, Cooley and Beard have established and will maintain a “lending library” of pre-cut piece parts – hanger brackets, pin brackets, anchor pins and entry bars – so the relatively small amounts of steel required for these items does not have to be bought before a gate is actually constructed, at retail prices. Plenty of short-length scrap is left over from these projects to provide the “seed steel” for this repository. Steel for these items in the future will be bought and delivered right along with the bulk of the gate steel, under quantity discounts. When the project is nearing completion, steel to replenish the repository can be cut into pieces sized to be comfortably handled by one person and easily trans-

Above: Using the skid-steer to place big fine rocks in front of the gate. **Below:** The skid-steer is the easiest way to handle heavy steel. Photos by Pic Walenta.



ported in a pick-up size vehicle bed. Shortly after the gate is completed, replacement piece parts will be fabricated in the shop and returned to the “lending library” (repository) until needed for the next cave gate.

Eighth, understand your landowners and manage them well. Federal and state agencies in particular are prone to have special rules, regulations and folkways that can be troublesome. On one project, a mere rumor that we were going to videotape the construction caused reverberations all the way to Washington, D.C., nearly scuttling the project at the last minute. In general, it is much easier to work on private land with cooperative landowners – and the Vierras, much to their credit, were extremely cooperative and supportive. Still, they

would not have appreciated our rutting up rain-soaked fields or leaving a mess behind, let alone if we’d burned their farm down. A great deal of effort on this project was invested in making sure we weren’t impacting fields and roads on the property.

As always: Watch your campfire. As the now politically correct Smokey says: Only YOU can prevent wildfires! None of the problems that one might run into in conducting a project of this size and nature should be daunting or even frustrating. After all, if this work were easy, anybody could do it. “Problems” are merely non-optimal contingencies that should be anticipated, planned for, and in the event managed. Plan for the fact that nothing ever proceeds as planned. What you’re prepared to do when life doesn’t follow your script makes the

difference between success and failure.

A great BIG thanks to all the funding agencies and volunteers, and especially to the Mike and Rebecca Vierra, for underwriting a truly worthwhile project and sharing some really fine feasts and fellowship in the woods. Let’s do it again soon! (Think: McCormick Cave regating and Onyx Cave gate repair, maybe in April ... hint, hint.)

Below: The completed gate. Welcome to your protected home *M. Grisescens*. Photo by Jim Cooley.





Above: Testing the strength of the completed gate. Yep, it holds up well! Left to right: Jim Cooley, Bree McMurry (above), Pic Walenta (below), Joe Williams (inside), Alicia Wallace, Jon Beard. Photo by Jim Cooley.