

THE MSS LIAISON

VOLUME 56 NUMBER 11-12

November - December 2016

AFFILIATE ORGANIZATIONS:

CHOUTEAU-KCAG-LEG-LOG-MMV-MSM-MVG-OHG-PEG-RBX-SPG-SEMO-MCKC-CCC-CAIRN.

Distributed free on the MSS website: <http://www.mospeleo.org/>
Subscription rate for paper copies is \$10.00 per year. Send check or money order made out to the Missouri Speleological Survey to the Editor, Gary Zumwalt, 1681 State Route D, Lohman, MO 65053.
Telephone: 573-782-3560.



Remembering Ron Oesch - A Tribute by Tom Aley

Ron Oesch was introduced to me by a snail. It was a tiny white aquatic snail that lives only in Tumbling Creek Cave at the Ozark Underground Laboratory. As happens far too often this snail and his or her siblings were in imminent danger of extinction. That is why this species (actually this genus since this is the only species in the genus *Antrobia*) had recently been added to the federal Endangered Species List. Ron had agreed to serve on the "Recovery Team" that was to plan for the recovery of the species and that is the why and how of meeting Ron.

Ron was born on November 15, 1930 in Garden City, Missouri. When Ron was about five weeks old the family home was destroyed by fire. Being winter, his mother wrapped him in blankets (Ron claimed it was swaddling clothing) and placed him in the milk barn. The tough survive! A few months later the family moved to Iowa then in 1935 back to East Lynn, Missouri.

In 1965 Ron received an M.S. degree in Biology from Central Missouri State University in Warrensburg. His thesis was on bone deposits in Crankshaft Pit Cave; more about that later. Ron was a high school biology teacher for 11 years and after that worked for a not-for-profit educational organization for the next 22 years. Ron was dedicated to science, education, caves, the environment, friends, and travel. He died in St. Louis on October 6, 2012.

Back to snails and Ron. Maybe you didn't know that Ron was a snail expert in addition to being a cave person. He authored a major book on the land snails of Missouri that is to be published by the Missouri Department of Conservation. Publication is being delayed by an academic who wants to make some very minor additions but is moving even slower than snails. Some of the photos for the book are incredibly good and many of us are hoping that publication, with or without additional input, will occur soon. On the topic of slow moving things, Ron is also the author of "*Missouri Naiades, a guide to the Mussels of Missouri*" published by the Missouri Department of Conservation. And finally, Ron is acknowledged in Bill Pflieger's book "*The Crayfish of Missouri*" for making available distribution records from his extensive collection of Missouri crayfish. As we shall see, Ron collected lots of atypical things.

Ron liked bones. Old bones or fresh bones, it made no difference. First, about the old bones (and this gets us to caves). First there was Crankshaft Pit in Jefferson County, Missouri in 1966. The cave is not far from the Meramec River, a stream that is prominent in Ron's personal history and on which he and friends floated many times. At the base of Crankshaft Pit was a mélange of mud, bones, and auto parts including a crankshaft. You can read about the bones in the NSS Bulletin Vol 29:4, October 1967. That was back in the days when the Bulletin was readable and well worth the paper it was printed on. Unfortunately, it is no longer readable, no

longer the Bulletin, and no longer worth the paper it is printed on (as it is now only in electronic format). I really regret the passing of old friends.

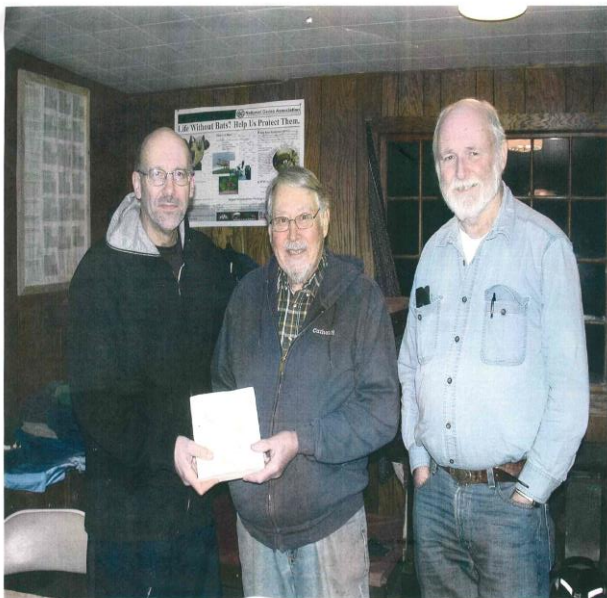
Crankshaft Pit is about 65 feet deep and for thousands of years was a natural trap for animals. Bones from lots of different small mammals of Pleistocene Age were found as well as bones of some larger animals including ground sloth, tapir, peccary, horse, giant armadillo, and even a mastodon tooth and rib. I wonder where the other 99% of the mastodon went. Radiocarbon dates (excluding their confidence intervals) were 2,420 years for the tapir, 2,980 years for the mastodon, and 7,551 years for the sloth. Back in those earlier days caving in Missouri was a bit more exciting and challenging.

Crankshaft Pit was a valuable repository, yet it did not yield its treasures easily. Early on Ron demonstrated great skill in enticing friends into his projects. For Crankshaft he had a total of about 30 helpers excavating, hauling, washing, and sorting. Dave Hoffman was responsible for classic Ozark engineering, and even the landowner and his tractor helped. That was classic Ron Oesch organizing. One would have thought that the massive undertaking at Crankshaft Pit would have ended Ron's fascination with old bones, but it didn't. In 1968 and 1969 Ron was working with Paul Parmalee of the Illinois State Museum and many helpers in the paleontological excavation of Brynjulfson Caves near Columbia. Again, a lot of Pleistocene material with some more recent archeological material. Illinois State Museum Report of Investigations number 25 resulted with Parmalee and Ron as the authors.

Now to newer bones and the infamous Clyde (with a big thank-you to Dorothy Stade). In 1969 the NSS Convention was in Lovell, Wyoming. Ron rode west from St. Louis with John and Dorothy Stade and their two small children. On the way west Ron was busy trapping small mammals every evening for comparative purposes, which added to his bone collection (and undoubtedly the aroma in the station wagon). Somewhere in Wyoming a pit stop was made and a "mummified" pronghorn antelope was discovered. Sometimes you find things that you just can't seem to leave. To accommodate Ron the legs were stuffed into the body cavity and the remains (Clyde) were stuffed into an old Army duffel bag and tied to the top of the car. Apparently Clyde was not all that mummified and was accompanied by his own ecosystem of wee beasties that rained down from

the bag anytime the car stopped. Normal people scattered. Even cavers noticed. Those who would wallow in guano none-the-less demanded that Ron pitch his tent at the down-wind edge of the camping area and keep Clyde with him. A camp dog reportedly took a sniff and dashed through camp yelping his displeasure. Ultimately, Clyde, Ron, and the four Stades made it back to St. Louis where the defleshing of Clyde was finished. The fate of the duffel bag is unclear.

From about 2002 to 2012 Ron spent several weeks a year with Cathy and me at the Ozark Underground Laboratory. He worked hard on various surface conservation projects including what he called "Resurrection Glade". It is a 40 acre dolomite glade in the recharge area for Tumbling Creek Cave. It was part of a large parcel we purchased as part of protecting the cave and its water quality. Ron and various friends (including John and Dorothy Stade) worked hard on restoring the glade to a much more native plant community. Mullein and thistles were chopped out with hoes. Ron routinely carried seeds of native flowering plants in his pocket and



Ron Oesch (center) and Dave Ashley holding a plaster cast of a cat track from the Cat Track Passage in Berome Moore Cave. Photo in the Field House, Ozark Underground Laboratory. Tom Aley on right. Photographer unknown.

would drop a few in each bare spot where a mullein or thistle had been removed. Invading cedars were cut; Ron had a firm dislike for cedar trees where native grasses and forbs could otherwise grow. In later years Ron had difficulty walking and had a handicapped symbol that hung from his rear view mirror. He justifiably used it in town, but it didn't keep him from walking over his glade to chop out weeds and other invasive plants.

When Ron was working on the glade he was always watching for plants that were not familiar to him. Pieces were collected and Ron and Cathy spent many evening hours together keying them out. We never seemed to run out of mystery plants.

A Celebration of the Life and Legacy of

Ronald Dean Oesch

November 15, 1930 – October 06, 2012



A drawing of Ron Oesch from his memorial celebration; it depicts his wide range of interests. Artist unknown.

One Sunday Ron unexpectedly showed up at our house with a bucket of small land snails. He explained that they represented a species that belonged in our (his) glade but that he hadn't been able to find here. He asked if he could put them out on the glade. There's a picture in my mind of Ron walking across the glade, sprinkling snails, and saying "run free little ones, run free". I imagine (and hope) that some of the progeny are still there.

Ron cared a great deal about a lot of important places and things. Caves were near the top of his list. All who knew him were fortunate, and we all greatly miss him.

Acknowledgements: I knew Ron for years from the technical literature, but I didn't actually meet him during his caving years. In writing this tribute I relied heavily on a manuscript by Dorothy Stade on Ron and the 50 years that she and John knew him. They were very frequent travelling companions and helpers on his projects. Cathy and I attended a splendid celebration of Ron's life and legacy on March 10, 2013 at the Dana Brown Education Center, Shaw Nature Reserve, Gray Summit. I have made appreciable use of the handout given to those who attended. The drawing of Ron is from that celebration and was the cover of the handout. I believe it was drawn by a former wife. It depicts Ron equipped for the field and for all of his various activities; a big "thank you" to the fine artist who clearly captured our great friend.

Identifying Cave Life: Part 3 – Crustaceans. This is part of an occasional series to help those doing cave monitoring (or cavers who are just interested in knowing what they are looking at) to be aware of what they can and cannot realistically identify in the field within Missouri caves.

The identification of crustaceans to species level is generally a technical matter requiring the collection of specimens, but there are exceptions, and the casual observer can go a good way towards narrowing the possibilities and identifying sites for future more detailed assessments.

The largest and most spectacular cave crustaceans are the crayfish, easily distinguished from surface crayfish



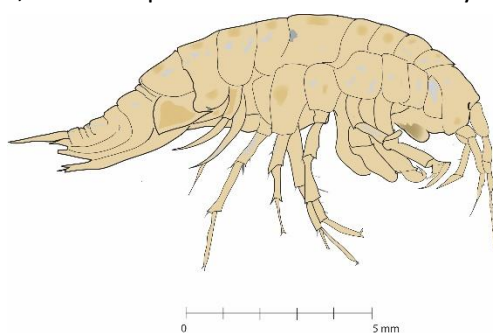
by their lack of color and eyes and slender build. The two commonest species are hard to tell apart, but they can be distinguished just by range. The bristly cave crayfish, *Cambarus setosus*, is found in southwest Missouri in the White River drainage as far east as Christian County, whereas the Salem cave crayfish, *C. hubrichti* (illustrated) is found in the Black, Meramec and Gasconade River drainages of the southeast and central Ozarks, as far north as Phelps County. There is a third species, known only from one cave situated in between the ranges of the other two. Any blind, white crayfish seen in a cave in this area

within the North Fork drainage - Howell, Ozark, Douglas or Taney Counties - would be of considerable interest!

The surface crayfish which frequently show up in caves are another matter. Missouri is graced with a bewildering diversity of crayfish, some of which are easy to identify, some not so much. Short of collecting a specimen (which requires a State collection permit and a valid research project) your best bet is to take photos, most easily done with a temporarily detained specimen. Catching crayfish in shallow water takes a little practice but is usually not too hard. Alarmed crayfish scoot rapidly backwards, so approach from the rear with a wide palm and scoop up the crayfish. Photograph both the back and the underside paying special attention to the pincer and the head area. Back at home, the photos can be matched using the excellent (and cheap!) guide published by the Missouri Department of Conservation, *The Crayfishes of Missouri* by William Pflieger. Species which most often enter caves include the ringed crayfish, often invasive outside its natural range, the spot-handed crayfish, and the northern crayfish, some populations of which may be troglophilic, living permanently in their cave.

The other aquatic crustaceans are a bit less conspicuous but most cavers are at least familiar with cave isopods, which occur in almost all cave streams of any size as well as other aquatic habitats. The most common problem for the beginner is distinguishing two broad categories of cave crustaceans – isopods and amphipods. Usually, this is straightforward. Isopods are more-or-less elongated and are flattened from back to underside, so that that you usually see them with the back upwards. Amphipods are less elongated, they have shorter appendages and they are flattened side to side in a C-shape, with the tail end bent under, and they usually swim or scuttle about on their sides.

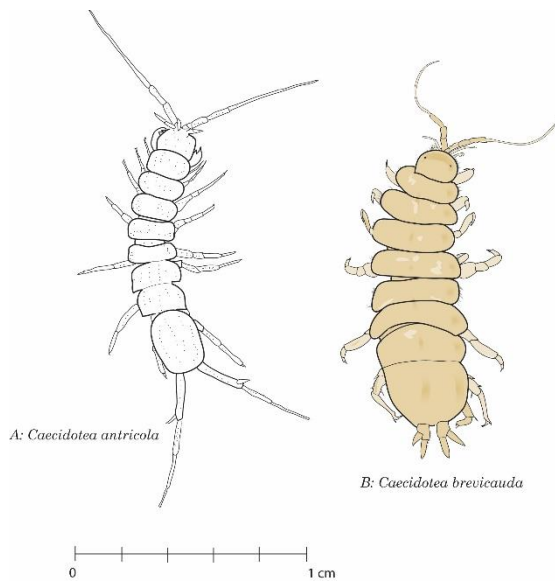
One group that may give trouble at first glance are *Bactrurus* species amphipods, which are much more elongated than other amphipods, an adaptation to their primary habitat, the small interstitial spaces in the epikarst overlying the cave passage. You will find them in drip pools more often than in streams. But a closer look shows that they are also flattened side to side, and the tip of the abdomen is usually bent under.



Left: *Bactrurus* species amphipod; Right: pigmented amphipod

So *Bactrurus* can be identified at least tentatively to genus – there are two, possibly three species. As for the other cave dwelling amphipods, you can note whether the animal is pigmented or not. Amphipods completely lacking in pigment are most likely one of the fully cave adapted (stygo biotic) *Stygobromus* species – these are small, generally topping out at no more than 4 mm. Distinguishing the species is difficult even for the specialist. If you see a completely white amphipod significantly larger than this, it is most likely *Allocrangonyx hubrichti*. These must remain tentative calls – for one thing some individuals of pigmented amphipod are very pale and can be confused with one of the stygo biotics. Pigmented amphipods are usually gray but sometimes orange. There are four common cave dwellers which cannot be identified further in the field, even though they are from two different families.

Isopods can also be broadly separated into pigmented versus white (stygo biotic) species. The stygo biotics can be easily distinguished by their elongated bodies with long appendages at either end. You are safe in calling them one of the *Caecidotea* species (there is one exception but it is tiny and rare), but again distinguishing the various species is a job for the specialist. Just as for amphipods, the pigmented isopods are trickier. If you are



Left: stygobiotic *Caecidotea* species.
Right: *Caecidotea brevicauda*

deep into the dark zone in the flood plain caves of eastern Missouri or Boone County, the short-tailed cave isopod, *Caecidotea brevicauda*, is common and often seen in amazingly large numbers. As well as being pigmented, they are stouter of build with much shorter appendages than the stygobionts. In near-entrance situations throughout the state, one of two species of *Lirceus* are common. These are more compact still, and are closer in shape to their terrestrial relatives, the pill-bugs.

Pill-bugs are very common in twilight and near-dark zone settings. There are almost all alien invasive species and cannot be easily told apart. More interesting are the uncommon species of cave adapted terrestrial isopod, of which several species may occur in Missouri. This group is still being sorted out and some of the species currently recognized may not be valid. They are slenderer and less compact than pill-bugs, and have only faint pigmentation. Distinguishing these is again a job for the specialist. –Mick Sutton



Left: pill bug. Right: cave adapted terrestrial isopod: *Brackenridgia ashleyi*

MSM. This semester we built a “cave” in the Newburg Children’s museum. The cave has a speleobox at the entrance, then the child slides into the “cavern room.” The cavern room has a hidden door that an adult can use to enter the cave as needed. Construction was completed in late November. Now, in collaboration with Roubidoux Grotto and museum volunteers, the cave is being completed with paintings, sculptures, and educational pieces. **Also,** MSM has been given an approximately 16 sq. miles area to search for caves on Forest Service land, near Beulah, Mo. There were previously no documented caves in the area. Currently we have 3 new caves documented, with much more area to be covered. **Sept 3rd** - New member’s trip was to Perkin’s Cave. Cavers included Sarah Klaas, Ian Perkins, Tiffany Wysong, Rebecca Shaffer, Garrick Webster, Ben Esker, Dan Meyer, Christina McEachern, and Lilly Gerneroth. **Sept 8th** - Andy Free taught a workshop in Waynesville, MO to two local fire departments. The goal was to teach emergency personnel how to handle a rescue/first-aid situation in a cave. Lukus Shoffner, Michael Rouleau, and Joey Castrilla acted as the injured persons in McCann cave. Three rescue teams were sent in to assess the situation. They learned the importance of planning before entering, and not looking in places that the team before them had already searched. Also, carrying an average sized man, with a broken leg, from the back of a cave can be a lot of work! **Sept 10th** - Alex Litsch led a trip to the Decker Cave area to teach new members how to conduct a cave survey. New surveyors are Dalton Adamson and Cliff Rickard. **Sept 11th** - Jessica Self led a bio trip into Mill Creek Cave in Phelps Co., accompanied by Lukus Shoffner and Owyn Self. 20+ Cave salamanders were counted! Garrett Wood and Jackson Eberle led a new

members trip into Railroad Cave in Pulaski Co. Cavers included: Makenzie Schulta, Ben Esker, Matt Mellon, Alex Wehar, Bayleigh Mitchell, Wyatt ByFord, Erik Gull, and Tyler Sanders. **Sept 17th** - Jackson Eberle led Ben Esker, Katie Miller, Dalton Adamson, and Kayla Bruemmer into Finley Cave. **Sept 24th** - Alex Litsch, Jeremy Weih, and Jackson Eberle assisted in surveying Gegg Cave in St. Gen Co. They broke into and surveyed 150 feet of unexplored passage! Onondaga Cave State Park held their annual Green living fair. MSM brought the speleobox and other cave materials to show the public what we do! Members from KCAG stopped by our booth to say hello. **Sept 25th** - MSS Meeting in Perryville, MO. Lukus Shoffner, Jessica Self, and Olyvia Self assisted Jon Beard in speleothem restoration in Berome-Moore. **Sept 30th - Oct 2nd** - MVOR in Bonneville, KY. Lukus went into Thornhill cave and saw two large catfish, 50+ cave crayfish, and a banded sculpin. This cave has 21 miles surveyed, with much more to go. Thornhill used to be a gypsum mine. Krista Bartel led Garrett Wood, and Ian King into Roppel Cave to do more survey work. **Oct 8th** - Lukus Shoffner, Michael Ferguson, Jessica Self, Olyvia Self, and Owyn Self did a door-to-door trip in Cathedral Cave in Onondaga Cave SP. Alex Litsch went to TAG and visited 8 caves over 5 days. He dropped a 250'+ pit. **Oct 14th** - Lukus Shoffner, Jessica Self, and Joey Castrilla attended CPR/Wilderness training through the U.S. Forest Service. **Oct 15th** - MSM helped throw Spooky Tours at Onondaga Cave SP. All together we raised about 900 dollars! Another door-to-door trip was done in Cathedral as a thank you trip from the park. **Oct 22nd** - Alex Litsch, Garrett Wood, Jackson Eberle, Michael Rouleau, Lukus Shoffner, and Jessica Self went camping at Boiling Spring's Resort in Licking to prepare for MVOR. The next morning we joined Spike and Ashley Crannick for ridge walking in the Beulah area. One cave was found, not on Forest Service Property. **Nov 2nd** - Joey Castrilla, Michael Rouleau, and Lukus Shoffner gave a presentation on rescue and safety in caves. Andrew Moore, Lukus Shoffner, Jessica Self, Olyvia Self, Spike, and Ashley Crannick joined Roubidoux Grotto on a Roubidoux Clean up trip. **Nov 18th** - Ridge walking, Zero cave found and named. **Dec 7th** - Mick Sutton came to Rolla and gave a wonderful biology talk to the group! **Dec 11th** - Ridge walking. – Jessica Self

Roubidoux Grotto (RBX): Ryan Thompson brought up discussion on water quality monitoring of streams coming out of caves and comparison of seasonal differences as well as quality. RBX continued work with MSM



RBX and friends on Roubidoux cleanup.

Grotto on simulated Cave construction and education information. Karen Hood contacted three local newspapers with an article about illegal cave vandalism. The article explained that the Roubidoux Grotto is monitoring caves and is involved with clean up and conservation management of local caves.

Interested cavers can contact RBX concerning local caving. Discussion of 2017 caving opportunities: Jan. 1st, 2017 - RBX going New Year's Day to Railroad Cave; Apr 7th- 9th - Spring MVOR hosted by MSM Spelunkers; Jun 19th -23rd-NSS Convention. **Nov. 5th** – Dan Slais, Karen Hood, Jessica and Olyvia Self helped on a cleanup of Roubidoux Cave. Five bags of trash were brought out. Several bats, salamanders, frogs, and insects were seen. Cave has several areas vandalized with paint. – Dan Slais

SEMO Grotto. May 13th, 2016 – Michael Bradford, Alex Litsch, Ray Shaw and Chad McCain conducted survey #12 in Gegg Cave in Ste. Genevieve Co. 592.2' of survey was obtained. The entrance on the surface assumed to be a 2nd entrance to the cave was found from the inside. **June 13th** – Aron Katz, Mark Brewer, Ray Shaw and Chad McCain returned to Gegg Cave via the new Esoteric Cave entrance. The breakdown was stabilized and easier entry was obtained as a result. 464.1' of survey was obtained. **June 20th** – Mark Brewer and Paul Hauck obtained 262.4' of resurvey and 913.4' of new survey was obtained in Merlins passage in Crevice Cave. This

brings the survey out in to the Eternity Passage. **July 6th** – Paul Hauck, Richard Young and Chad McCain obtained 417.7' of survey in Gegg Cave only to exit in flood conditions. **July 15th** – Dan Lamping, Ray Shaw, Aron Katz and Chad McCain returned to Gegg Cave and obtained 313.7' of survey to complete a large loop. **Aug 21st** – Alex Litsch, Jeremy Weih, Gary Resch, Edmund Tucker, Chris Goodson, Michael Bradford, Shawn Williams, Chris Doerhoff, Ray Shaw, Aron Katz and Chad McCain continued survey in Gegg Cave via the Esoteric entrance and obtained 1,111.7' of survey with another large loop closure. **Sept 3rd** – Michael Bradford, Chris Doerhoff, Alex Litsch and Chad McCain obtained 1,270.9' of survey in Gegg Cave while surveying upstream in the Esoteric River. Many leads were found in the ceiling and survey ended at a junction. Another side passage was surveyed and a tight passage continued with plans of a dig in the future. **Sept 24th** – Gary Resch, Derrick Weisbrod, Lee Kern, Alex Litsch, Jeremy Weih, Jackson Eberle, Michael Bradford, Brandon VanDalsem, Rita Warden and Chad McCain returned to Gegg Cave and obtained a total of 1,215.7' of survey in Gegg Cave, all in the upstream Esoteric River section. Litsch led a team through a dig found on the last trip and surveyed this passage to the bitter end. Upper and lower level loops were surveyed upstream and this was the first survey where the Distox's were used. Results were impressive, especially on the loop closures. **Oct 21st** – Chad McCain tested out the distox while surveying 3 small caves in Shannon County. Canyon Cave, Fern Rock Cave and Cave of the Sentinal Tree. **Oct 24th** – Chad McCain found and mapped several caves with the Distox along the Katy Trail including Robbers Roost Cave, Archaic Fire Cave, What a View Cave as well as several other caves not mapped. **Oct 27th** – Chad McCain found and surveyed new caves along the Katy Trail. All surveys were conducted with the Distox. Caves found and surveyed include Giant Pillar Cave and Diving Wasp Cave. Several other caves were found but not mapped. Eagle Bluff Cave was also found and mapped with a length of 151.9' of survey with 4 entrances. **Oct 28th** – Chad McCain found and surveyed Campfire Cave along the Katy Trail in Boone County. Several other caves were also found but not mapped. Campfire Cave is 74.8' long and continues through a low crawl filled with coon scat. **Nov 9th** – Chad McCain started a new survey of Garrett Cave in Franklin County. This cave was mapped long ago but the map is lacking in detail of any kind. 279' of survey was obtained, solo survey with a Distox. This cave was heavily mined for Onyx for the 1904 World's Fair. Due to the width a loop was surveyed as well with results being off by 3" with no target plates and no help lining up shots. **Nov 11th** – Gary Resch and Chad McCain surveyed Cottonwood Cave in Ste. Genevieve Co. This cave was expected to take us into an upper level of Gegg Cave; however, it shut down 135.4'. We then went into Esoteric Cave and did some lead mop up just inside this entrance and obtained 226.2' of survey while knocking out 3 leads and another loop. Distox's were used exclusively with more impressive results. **Nov 25th** – Alex Litsch, Gary Resch and Chad McCain returned to Gegg Cave for survey #20. Three more loops were closed with the Distox's. 936.8' of survey was obtained and the cave is now 3.2 miles in length. **Nov 27th** – Chad McCain surveyed Hideout Cave and Breakdown Cave in Howell County with the Distox. Hideout Cave was 113.8' of survey and Breakdown Cave had 117.3' of survey. **Nov 28th** – Chad McCain surveyed Piney Creek Cave with the Distox in Barry County. The stream crawl continues in this cave with a total of 152.2' of survey so far. **Dec 1st** – Chad McCain surveyed Salamander Cave and Stacked Cave in Howell Co. Loops were closed in both of these caves with the Distox and a complex multi-level loop was closed in Stacked Cave. The entire survey of Stacked Cave took 30 minutes to record all of the data. The same survey with a compass/clino would have taken several hours due to the tight quarters and lack of locations for stations which the compass/clino could be read. Salamander Cave was 93.2' long and Stacked Cave was 132.3' long. **Dec 2nd** – Chad McCain surveyed Railroad Cave in the MTNF in Wayne County with the Distox. **Dec 14th** – Chad McCain returned to Garrett Cave in Franklin Co. and obtained 653.4' of solo survey with the Distox. A survey was run down one wall of the trunk line, only to survey back to the original starting point to close a solo loop to test how accurate the survey is. Again, with no target plates and no help this 650' long loop was closed to .75' horizontally and .08' vertically. This was done to test the abilities of a solo survey in a large easy walking cave. **Dec 15th** – Ridge walking was done in and around Kohms Cave in Ste. Genevieve Co. Three new caves were located in the area and orange graffiti spray paint was found inside the cave with dates of 2014. A lot of recent breakdown was

found inside the cave. The previous owner stated this is recent in the past 8 years. **Dec 28th**— 514.6' of line plot survey was conducted in Kohms Cave in Ste. Genevieve Co. This was done exclusively with the Distox and all data was obtained in approximately 1.5 hours.—Chad McCain

MMV. Oct 29th - Bryan McAllister and Don Dunham visited The Offsets - Mine La Motte, Missouri during a trip to explore MVOR site possibilities. The site is a lake with many mine passages. It is a unique site but was deemed too dangerous to hold an MVOR. **Nov 12th** - Rick and Michael Haley visited Meramec Caverns. It had been closed March - June due to toxic fumes from a surface dump. The air filters were running and there was just a hint of vapors remaining. **Nov 14th** - Don Dunham, along with Scott House and Ken Grush mapped caves in Perry County. The caves include three small Legion Caves and Shafer Cave. **Nov 15th** - Don Dunham, Doug and Michael Leer, and Scott House monitored caves in the Ozark Scenic Riverways. Caves were Bunker Hill, Little Bunker Hill, Rough Hollow, Meeting House, Middle Meeting House, Lower Meeting House, Rymer, Blue Breakdown, Flue, Blue Springs Tunnel, Hospital and Blue Springs Cave. Monitoring included recent visitation,



Frost flowers observed during the Dec 15th-16th Scenic Riverways trip.

trash, graffiti, and bio counts. Bat counts were very low, however, the more well-known bat caves will not be monitored until later in the winter when the effects of any WNS will be more evident. **Nov 16th** - Second day of monitoring caves (same participants) in the Ozark Scenic Riverways. Caves were Whiskey, Bay Creek Camp and Bluff Cave. For the past two days, a large quantity of frost flowers were observed in the woods. The low temperatures kept them "alive and well" for at least 48 hours straight which is probably a rarity. **Dec 26th** - Doug and Michael Leer visited Mud Cave in Greensfelder County Park in St. Louis County. It

is a fairly small but interesting cave with a very small entrance that leads to a tall canyon passage. Wood rats and tri-colored bats were observed.--Doug Leer

LOG. Officers for 2017 are: Ken Long, Chairman; Christen Easter, Vice-Chairman; Alberta Zumwalt, Secretary-Treasurer; Gary Zumwalt, MSS Rep. Dwight Weaver is the grotto historian and Rosie Weaver has the grotto library. At the November meeting, LOG members finalized some changes to the grotto constitution and bylaws. We are also looking for a new place to meet in 2017. The first meeting of the year will be in April. After contact from Dwight Weaver, Ken Long checked out a cave near Linn Creek which may be an unrecorded cave. Linda Marg attended the Cave Pumpkin Patch event at Arrow Point Cave, Brumley, MO. On Dec. 2nd, Gary & Alberta Zumwalt met Klaus Leidenfrost at Goodwin Sink. While Klaus and Gary jack-hammered rock in the waterfall area, I cleaned, moved and stacked 54 tires, which will be picked up by a tire company when all are done. On Dec. 3rd, Ken Long participated in the Goodwin work day. Cliff Gill is in charge of the Morgan Co. project and we hope to get some work done on that soon. The grotto Xmas party was held on Dec. 11th at the home of Burke & Christen Easter, Camdenton, MO.—Alberta Zumwalt

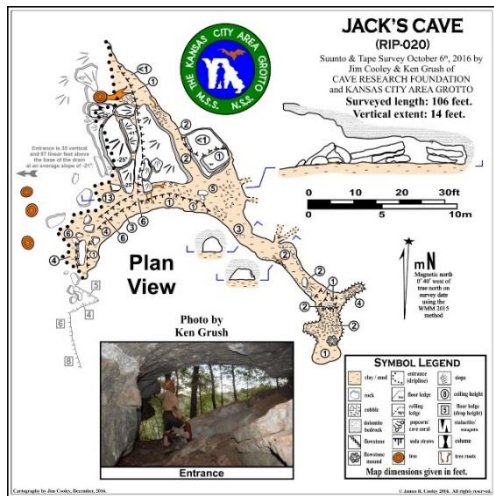
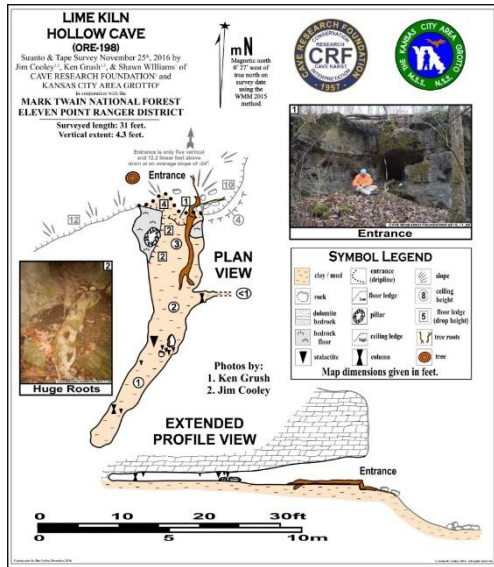
SPG. Nov 1st—Chris Lewis and Jon Beard assisted with Doug Gouzie's MSU speleology class in a field trip to adjacent Breakdown and Fitzpatrick Caves (Christian Co). Due to unusually warm, dry weather in October, the caves were very dry. The emphasis is the breakdown as well as the management and restoration of these caves. **Nov 2nd**—Brandon Van Dalsem surveyed Wraparound Cave at the Buffalo River as part of CRF projects there. He was assisted by Ed Klausner, Ethan Brown, Mark Jones and others. Those having spare time during sketching performed bio monitoring of the cave. After a while, helpers left to go to other nearby places while Ethan Brown stayed to help with the survey. Perhaps another full day is needed to complete the survey. **Nov 5th**—Dillon Freiburger finished the sketch map of Slide down Cave, and determined the extent of Top of the

Mountain Cave at the Buffalo National River as part of the CRF expedition week. **Nov 7th**—Jon Beard used a Dremel cordless drill with a small grinding tip to do some finishing touches on 14 stalactite repairs in Fitzpatrick Cave (Christian Co). Some color matching is yet needed to complete the repairs, but they are essentially “good-as-new.” Also —Brandon Van Dalsem assisted Dennis Novicky and Mark Jones in the survey of recently discovered passage in the furthest reaches of Three Forks Cave (Oklahoma). More than 500 feet was added to one of the state’s longest limestone caves (approx. 1.5 miles thus far). **Nov 10th**—SPG held its annual business meeting in the Auditorium Room of Fantastic Caverns (Greene Co) thanks to the cave management’s hospitality. A total of 30 attended the event, followed by a casual stroll through the tour sections of the cave. SPG participating members included Charley and Abby Young, Max White, Brandon Van Dalsem, Cynthia and Clayton Russell, Cheryl Paulson, Bill Palmer, Faith and Chris Lewis, Jim Huckins, Roy Gold, Dillon Freiburger, Lance Butler, Treavor Bussard, Matt Bumgardner, Jon and Alicia Beard. **Nov 11th**—Treavor Bussard and Jon Beard were joined by Mark Jones of the CRF in leading a geology class from Monett High School through the Main Room, Southeast Passage and Handshake Hall of Breakdown Cave (Christian Co) on a speleology field trip. Also on Nov 11th & 18th—Dillon Freiburger looked for stygobitic crayfish in Waterfall Cave in Taney Co., a cave where they are reported to exist. **Nov 12th**—Charley and granddaughter Abby Young, Bill Palmer, Jim Huckins, Roy Gold and Jon Beard had a trip to Ennis Cave (Arkansas) to photograph helictites in the Sistine Chapel and Crystal’s Room. **Nov 13th**—Brandon Van Dalsem and friend Phillip Shurtleff, Faith and Chris Lewis, Treavor Bussard and Lonnie Batson assisted Jon Beard in the completion of the survey of Carrico Cave (Dade Co). The ~1,200-foot cave is developed in the Warsaw Limestone near the Chesapeake Fault, which might account for the dipping beds and vast amounts of breakdown. Treavor counted 44 pips and two bristly cave crayfish among the fauna seen. The survey concluded in the northwest part of the cave in a 20-foot tall, but one-foot wide crack only partially entered due to its narrow, slippery-walled conditions with deep water below. The drafting of the map was completed shortly after. **Nov 19th**—Faith and Chris Lewis, Matt Bumgardner and Jon Beard hosted Craig Williams and Paul Konrad of CAIRN in a trip to Hall Branch Cave (Greene Co) to document paleontological and other features in the 2,004-foot cave. The group also recorded fauna in the cave that included 15 pips and assorted invertebrates. Some of the group also checked nearby Mousetrap Cave, once the resurgence to the main cave. **Nov 20th**—While Jon cleaned stalagmites in Paul’s Gallery of Fitzpatrick Cave (Christian Co), Faith and Chris Lewis showed Faith’s sister, Janie Flint, the cave, her first. Although just 637 feet in length, the cave is home to more than 30 species of fauna. **Nov 21st**—Dillon Freiburger and several Texas A&M biospeleology students monitored the entrances to Fitton, Ice Box and Mud caves at the Buffalo National River as part of a CRF project. **Nov 22nd**—Jon Beard along with Dr. Tom Iliffe of Texas A & M (Galveston) and three of his students to Back o Beyond Cave (Arkansas) at the Buffalo National River to monitor biology and conduct mop-up measurements in an effort to complete the cave survey begun by the late Bob Taylor. The 700-foot cave was shown in the past by the Park Service but is now has a closure order to the public due to WNS. Also—Dillon Freiburger and Texas A&M students located and surveyed Oven Bird Cave and located and monitored Attic Cave at the Buffalo National River as part of continuing CRF project work there. **Nov 23rd**—Dillon and students surveyed River View Shelter, documented a new cave named Sore Wellie Cave and started the survey of Rat Pit Cave at the Buffalo National River. **Nov 24th**—Brandon Van Dalsem, as part of CRF projects in Barry County’s Mark Twain National Forest, GPSed and surveyed a number of short caves and shelters including Uno Cave, Delta Cave, Stepped Ceiling Cave, Sidearm Cave, Log Cabin Shelter, Blue Wall Cave and Big Brown Shelter. **Nov 25th**—As part of CRF projects in Mark Twain National Forest, Eric Hertzler assisted Jon Beard in the survey of Genesic Dome Cave (Christian Co), then while Jon finished out the survey and sketching, Eric surveyed nearby Snug Joint Cave. Both caves total a combined 110 feet. Other than a couple of salamanders in Genesic Dome, only insects and one spider were seen. **Nov 27th**—Treavor Bussard and friend Ben Sanning assisted Jon Beard in the continuing survey of Boswell Tractor Pit (Polk Co). About 270 hard-earned passage was mapped, including a very narrow, very muddy side passage known as the Subway. Roughly 400 feet remains to be surveyed. **Nov 30th**—Jon Beard accompanied MDC bat biologist Shelly Colatskie, MSU bat biologist Dr. Tom Tomasi and two of his students to Long Cave (McDonald Co) on MDC land to conduct bat research. While there, they recorded all fauna seen, took photos. Jon is planning to survey the 1,700-foot cave in 2017 as part of a CRF project. The

cave is developed in the Compton Limestone just below the thin Northview Shale, is developed mostly along joints. **Dec 2nd**—Jon Beard checked the water level of the First Watercrawl in Garrison Cave #2 (Christian Co) in preparation of a future planned trip. **Dec 3rd**—Jon Beard assisted in the continuing dig and surface work in Goodwin Pit Cave (Laclede Co) along with Tom Grey, Klaus Leidenfrost, Ken Long, Randy and Melanie Rosebrough and others. **Dec 4th**—Two teams added over 600 feet to the ongoing survey of Shoal Creek Cave (Newton Co) from “The Hole” along linear passage. In team one, Jon Beard was assisted by Dillon Freiburger and Treavor Bussard. In team two, Brandon Van Dalsem was assisted by Phillip Shurtleff. The first 1,500 feet of cave, mapped in prior sessions, is an anastomotic maze of crawlways. The remainder of the cave, further in, consists of linear passage including this day’s survey. The total stands at over 2,100 feet with roughly 1,000 feet remaining to be mapped, much of it large walking passage. **Dec 6th**—Charley Young and Roy Gold assisted Jon Beard in the continuing survey of Little Bear Cave (Ozark Co), reaching the end of the main passage. There remains several hundred feet of side passages and loops to map. While Jon sketched, Charley took several photos. Roughly 35 pips were seen to be added to the faunal database. **Dec 8th**—Brandon Van Dalsem and Jon Beard accompanied Rhonda Rimer and Chez Kleeman and others on a cave scouting trip in Barton County (just west of the Ozarks). Five sandstone caves were documented: Harris Caves #1 and #2, Pooled Cave, Lake Cave and Coal Shelter, all formed in the Warner Sandstone and a coal seam underneath. After the entrances were photographed, the group visited nearby Patton Branch Cave, an impressive sandstone shelter documented decades ago. Jon and Brandon surveyed this 44-foot feature with a 55-foot dripline, also formed in the Warner Sandstone with coal visible in the lowermost walls. Other than an abandoned phoebe nest and raccoon scat, no fauna was observed. **Dec 13th**—A party of five consisting of three MDC folks plus Brandon Van Dalsem and Jon Beard searched for biota in the first 1,200 feet of Rantz Cave (Christian Co). One of the MDC agents collected two crayfish believed to be Williams crayfish for study. At least one salamander is believed to be an Oklahoma salamander (*E. tynerensis*). A photo will be sent to a crayfish expert for confirmation. Photos were taken of various subjects. **Dec 15th**—Jon Beard checked the water level and did some maintenance on the lock to the cave gate at Garrison Cave #2 (Christian Co). **Dec 17th**—Matt Bumgardner and Jon Beard assisted David Stern in sample collecting three bristly cave crayfish (with an MDC permit) in Garrison Cave #2 (Christian Co). David is a grad student from George Washington University (Washington D.C.) conducting research on crayfish DNA. As this cave is the “mother lode” of this species, this was considered the ideal site to obtain the samples. While there, Matt and Jon recorded other fauna including the photography of an adult grotto salamander. **Dec 19th**—Charley Young, Bob Fowler, Treavor Bussard and Jon Beard continued the survey of Hall Branch Cave (Greene Co) with several ceiling height measurements, two additional cross sections and other minor sketch work. Photography of speleothems and cave critters rounded out the day’s activity. With the day beginning in the single digits F, the cave was a warm reprieve, although those wearing glasses had to wait a few minutes before their glasses could be used to see. **Dec 21st**—Jon Beard presented seven 10-minute programs on karst resource management and speleology to sixth graders from Cherokee Middle School in Springfield as part of SPG’s public outreach program. **Dec 26th**—A team consisting of Dillon Freiburger, Treavor Bussard and Jon Beard completed the survey of Hall Branch Cave (Greene Co) with a few cross sections, ceiling height measurements and an extension of a profile view. Biota were noted and a photo showing entrances of Hall Branch and Mousetrap Caves was taken. **Dec 27th**—Melvin Johnson, Jon and Alicia Beard partnered with Springfield Park’s Robin Deckard plus Taylon Crim, Branden and Deah Powell (Teenage Junior Leader Volunteers with the MDC) to monitor biology in Crevice, Low Arch, Low Arch #2, Cozy, High Arch, Trace, In and Out, Coffin and Valley Caves at Lost Hill Park in Greene County. **Dec 28th**—Melvin Johnson, Treavor Bussard and Jon Beard led Robin Deckard, Taylon Crim, Branden and Deah Powell and Tom Spears (Missouri Master Naturalist) in monitoring caves in Ritter Springs Park in Greene County: Cricket Hole, Junction, Blowing, Ritter Bat and Possum Pit. **Dec 29th**—Charley Young and granddaughter Abby hiked the Indian Rockhouse trail at Buffalo Point (Buffalo National River, Arkansas), photographing the Rockhouse and other small cave features.—Max White

KCAG. Nov 2nd- Jim Cooley gave a presentation on caves and caving to the Pomme de Terre chapter of the National Association of Retired Federal Employees (NARFE), in Collins, Missouri. Cooley handed out his card at

the close of the meeting, with an offer to map any new caves turned in by attendees. This resulted in a good cave lead on Pomme de Terre Lake; this cave proved to be located on land owned by the U.S. Army Corps of Engineers.



Nov 5th - KCAG's Hickory County Project Manager Gary Johnson conducted the annual Elkton Cave annual landowner's trip and bat census. President Jack Peters, Josh Bookout, and Heidi Fletcher handled the vertical component, and Kristin Swanson did very well assisting landowners. MDC's Shelly Colatskie was along to count bats. Cliff Gill looked with Gary Johnson for a new cave, and they found it, but a canyon passage just inside was too narrow to push. **Nov 6th** - While assisting the Ozark National Scenic Riverways with a "Wounded Warrior" managed deer hunt, put on for the benefit of disabled veterans, Jim Cooley, Max White (SPG), Cheryl Paulson, and JW Sherron flagged a UTV trail down to Coalbank Cave, to prepare the way for a repair of the chain link fence that protects this large gray bat maternity colony. **Nov 16th** - Cooley attended a state-wide meeting of state and Federal agency personnel and project cavers to plan for the 2016-2017 WNS monitoring season. **Nov 19th** - Cooley visited Branson Cave on the Ozark National Scenic Riverways, to assess the gate for repairs to correct a breach. The gate had been dug under. **Nov 20th** - Cooley went to perform a routine lock maintenance on Bluff Cave, near the Powder Mill Research Center on the Ozark National Scenic Riverways, and discovered that it, too, had been breached. Cooley wrote reports for the park service on both gate breaches, describing how they might be repaired. **Nov 24th & 27th** - Cooley led a backpacking trip with Ken Grush and Shawn Williams onto the Mark Twain National Forest. The objective of the trip was ridgewalking and cave monitoring. A new, 31-foot-long cave was discovered and mapped, Lime Kiln Hollow Cave (ORE-198). These caves were monitored: Beaver Spring Cave, Muddy Cave, Thanksgiving Cave, Little Hurricane Cave, and Black Dagger Cave. Only one big brown bat was seen in ALL of these caves. Cliff Gill joined us on Nov 26th for cave monitoring. **Nov 29th** - Cooley located a

cave on Pomme de Terre Lake, Nemo Cave #1 (HKY-055), based on the lead generated by the Nov 2nd NARFE presentation. **Dec 6th** - Cooley visited an abandoned limestone mine on a rifle range in St. Joseph, Missouri with MDC biologist and private lands project manager to measure the entrance for a bat-friendly cave gate. **Dec 10th** - Cooley, Gary Johnson (KCAG Hickory County Project Leader), Jeff Page, Dave Egelund, and Troy Donohue visited Nemo Cave #1 to assess it for survey, but could not conduct the cartographic survey due to a lack of survey participants, plus encountering a passage with waist-deep water in it. They then ridgewalked elsewhere in

Hickory County but found no caves. **Dec 23rd** - Cooley visited abandoned limestone mines in midtown Kansas City, Missouri and Lee's Summit, Missouri, to inventory bats and check for WNS infection, with Shelly and Ron Colatskie (MDC & DNR), Ashley Matteson (MDC), Dr. David Ashley (Western Missouri University), and JT Layne (Stantec Consultants). Populations of tri-colored bats (*Perimyotis subflavus*) were way, WAY down, with many

already showing visible evidence of WNS infection. But big brown bats (*Eptesicus fuscus*) seem to be holding their own in Kansas City's abandoned mines. **Dec 30th**- Cooley and Lynn and Spencer Decker visited Flippen Cave in Benton County to check for vandalism on this recently breached (and repaired) gate, and to maintain the lock. They found only four apparently healthy tri-colored bats in hibernation – a number greatly reduced from historic levels.-Jim Cooley

The Story Behind the SLUG Cairn in Upper Thunder River, Carroll Cave. On a recent survey trip to map UR2 in Upper Thunder River, Carroll Cave, Bob Lerch, Josh Hafner and I stopped at a few places to take photos, which included a snapshot of the SLUG Cairn right before the beginning of the Jumps. Following the trip I posted the photo onto social media and a few cavers questioned the origins of the cairn and wondered whose initials were on the landmark. This prompted Jo Schaper, who saw the inquiries to contact Earl Neller, an old MSS caver. Earl subsequently reached out to John Cantwell, also an old MSS caver and one of the original explorers of Carroll Cave. Below is Cantwell's reply, written in January, 2017. - Dan Lamping

The cairn was built by Bob Starks, Bill Leubbers, and myself, Jan 1957. This was the second trip to Thunder River by anyone and MSS's third trip to Carroll. Jack Reynolds, Shirley Stafford, and Bob Starks had found Thunder River in Dec 1956. That was MSS's second trip to Carroll and the one on which Oz, Frank, and Jerry had found the Paradise Room. Then in Feb 1957 Jerry Vinyard and Dwight Weaver went downstream about a mile and left a cairn that became known as Jerry's Cairn. That cairn may have washed away by now or been covered by mud.

This was all before Thunder River was known as Thunder River. Frank gave a talk and slide show at the St. Louis County Library in April 1957 and wrote to Jerry for a slide of Thunder Falls and for a name suggestion. Jerry sent a slide with suggested name Thunder Falls. Frank used the name Thunder River at the talk and it stuck. Tex Yokum was at that talk. That was his introduction to caving. He had no real previous experience. Frank was running an informal caving class which is where Tex learned to cave and map. He was busy with a new baby that summer but

became more active in the winter and by the next summer had changed cave mapping.

The cairn was slightly above the Round Room. It was where the cave splits - you have the choice of wading through deep water or going up through breakdown away from the stream for a while. The Speleodigest article lists the cairn as 2 miles above Thunder Falls but that is too much. The article is based on a letter I sent to Oz summarizing what was known about Carroll. Oz rewrote what I had sent him, published it in the Western Mo Grotto newsletter under my name, and it was reprinted in Speleodigest.--John Cantwell



Bob Lerch looks at the SLUG Cairn in Upper Thunder River on a recent survey trip to map UR2.

MSS OFFICERS.

President – Dan Lamping, 4946, St. Louis, MO 63123 314-775-8584 daniellamping@att.net

Vice-President – Scott House, 1606 Luce St., Cape Girardeau, MO 63701 573-651-3782
scott_house@hotmail.com

Treasurer - Don Dunham, 147 Ron de Lee, Arnold, MO 63010. 402-203-3191 don_g_dunham@yahoo.com

Secretary - Alberta Zumwalt, 1681 State Route D, Lohman, MO 65053. 573-782-3560 Gzumw@aol.com

MSS DIRECTORS.

CAIRN – Craig Williams, 5454 Mardel, St. Louis, MO 63109. 314-695-1012 cwilliams@cairstl.org

Chouteau – Rita Worden, 22762 Valley Dr., Jamestown, MO 65046. 573-673-3388 wordenrl2323@yahoo.com

CCC – Krista Bartel, 625 Armour Blvd 3E, Kansas City, MO 64109. 816-812-5206. Kbartel1088@gmail.com
KCAG – Ken Grush, 32 Circle View Dr., Fenton, MO 63026. 636-600-0369 slagrush@gmail.com
LOG – Gary Zumwalt, 1681 State Route D, Lohman, MO 65053. 573-782-3560 Gzumw@aol.com
LEG – Al Quamen, P.O. Box 292, Carbondale, IL 62903. 618-549-2550 carbide@globaleyes.net
MCKC –
MMV – Doug Leer, 730 Lakeshore Meadow Dr., Wildwood, MO 63038. 636-207-8468 dogleer@gmail.com
MSM – Jessica Self, 521 Keeton Rd., Rolla, MO 65401. 573-587-2794 Gneiss.self@yahoo.com
MVG – Tony Schmitt, 1227 Perdiz Ln., Fenton, MO 63026. 314-482-0516 Tonymarn2601@yahool.com
OHG – Bill Heim, 2025 W. FR 178, Springfield, MO 65810. 417-889-0640(H), build_it1@juno.com
PEG – Lorin O’Daniell, 4515 Faraon-Apt. F, St. Joseph, MO 64506. 816-646-3240 lodaniell@yahoo.com
RBD - Dan Slais, 2384 Tea Road, Rosebud, MO 63091. 573-764-2406 dslais@fidnet.com
SEMO – Chad McCain, 6676 Ike Dr., Barnhart, MO 63012. 573-513-5785 chads93GT@hotmail.com
SPG – Max White, 2748 W. Maplewood, Springfield, MO 65807. 417-880-8475 bildmwc@aol.com

ADDRESSES.

Affiliate Organizations – vacant

Missouri Speleology Circulation Manager- Bill Pfantz – Wmpfantz@aol.com

MSS Liaison editor - Gary Zumwalt 1681 State Route D, Lohman, MO 65053. 573-782-3560 Gzumw@aol.com

MSS store - Don Dunham, 147 Ron de Lee, Arnold, MO 63010. 402-203-3191 don_g_dunham@yahoo.com

Research committee - Jerry Vineyard, Ozark Riverview Manor, 1200 W. Hall St., Ozark, MO 65721 JelenVnyrd@aol.com Other members – Oz Hawksley, Dwight Weaver, and David Ashley.

Historian-Dwight Weaver – 38 Village Marina Rd., Eldon, MO 65026. 573-365-1171 dwightweaver@charter.net

Cave Files - Scott House, 1606 Luce St., Cape Girardeau, MO 63701. 573-651-3782 scott_house@hotmail.com

MSS web site –www.mospeleo.org

Ozark Caving web site– www.ozarkcaving.com

Carroll Cave Conservancy website <http://www.carrollcave.org>

MCKC website – <http://www.mocavesandkarst.org>

Caves of Missouri Discussion Group – <http://groups.yahoo.com/group/cavesofmo>

Petroglyphs, inscriptions, & pictographs: rockartmo.com

The new MoCaves: <https://groups.yahoo.com/neo/groups/mocaves/info>

CALENDAR:

January 21st – Winter MSS meeting, 1 pm, DGLS Annex Bldg, 111 Fairgrounds Rd., Rolla, MO. MCKC meeting will be the same day and location.

February 4th – 5th – Goodwin Sink work days. Contact Klaus Leidenfrost if interested in helping: goodwinmgr@mocavesandkarst.org

March 1st - Next Liaison deadline.

April 7th-9th – Spring MVOR, hosted by MSM.

Missouri Speleological Survey

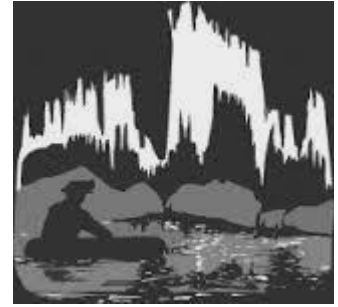
January 21st, 2017

Winter Board Meeting Agenda

Division of Geology and Land Survey Annex Conference Room
111 Fairgrounds Road, Rolla, MO

Morning Session

- **Building opens at 8:00** – informal time to socialize, view maps, etc.
- Cave Files Help Desk/Database tutorials, etc.
- Presentations, demonstrations, etc.



Board meeting begins at 1:00 PM

Administrative Business

- Roll call – Officers and Board
- Secretary’s Report and approval of last meeting’s minutes – Alberta Zumwalt
- Liaison – Gary Zumwalt
- Treasurer’s Report – Don Dunham
- *Missouri Speleology* – Don Dunham
- Affiliate Organizations – Vacant

Old Business

New Business

Affiliate Organizations

Projects and Announcements

- Cave files / Database
- Agency Reports
 - *Mark Twain National Forest*
 - *Ozark National Scenic Riverways*
 - *Missouri Department of Conservation*
 - *State Parks*
 - Others
- Affiliate Organizations Project Reports
 - Carroll Cave
 - Others
- Public Outreach
 - Facebook & Website

Annual affiliate fees of \$25.00 are due at this meeting. Payment should go to the MSS Treasurer, Don Dunham.

Annual reports for 2016 are also due at this meeting. Some organizations still need to turn in their 2015 reports. They are: CCC, MMV, MSM and MVG. Reports should go to the MSS President, Dan Lamping.

Next meeting & Adjournment

FIRST CLASS

**MSS Liaison
Gary Zumwalt
1681 State Route D
Lohman, MO 65053**

