


Bluffviews


a quarterly newsletter by Clifftop

January, 2014



Vol. 4, no. 1



*You are cordially invited to attend
a special Clifftop celebration
of the acquisition of the Seibert estate farmlands,
535 acres of Monroe County land that overlay much of Fogelpole Cave,
our state's largest and most biologically-diverse cave system.*



*Our celebration will include a presentation by Steve Taylor, PhD,
Illinois Natural History Survey,
and Clifftop's lead science advisor for the project.
Steve will discuss the conservation values of this unique landscape.*



*We will also give an overview of our planning for the large
landscape-level restoration.*

*1:00 P.M., Saturday, January 25, 2014
Monroe County Annex Building
901 Illinois Street
Waterloo, IL*

Light refreshments will be served



Clifftop -- Bought the Farm!!!

A very special farm. A farm that lies on top of a pristine underground wilderness. A farm that already is a very unique place and that will be – with time, restoration, and research – another special place for passive recreation, natural beauty, and wildlife homes in Southwestern Illinois.

On December 30th, 2013, Clifftop purchased 535 acres from the Seibert estate. The property, located three miles north of Renault, completely surrounds the 27-acre Fogelpole Cave Nature Preserve owned by the Illinois Department of Natural Resources, which securely protects two of the cave's main entrances.

The Fogelpole Cave system truly is a subterranean wilderness of state, federal and international significance. Please read Steve Taylor's article, which follows, to learn more about the treasures of this ecosystem which Clifftop's members and supporters now are privileged to protect.

The property lies above a large portion of the Fogelpole Cave system and the tract's acreage, with nearly 300 karst sinkhole features, plays a very important role in protecting the quality of groundwater entering the cave system. Initially slated for subdivision at auction sale, the tract will now become a preserve, sparing the cave from possible impacts from septic systems, homestead constructions, and mini-livestock holdings.

Our purchase was made possible by extraordinarily generous grants: \$1,915,050 (\$1,905,050 towards the purchase price and \$10,000 for initial restoration) from the Illinois Clean Energy Community Foundation and \$817,960 (\$796,960 towards the purchase price and additional acquisition costs and \$21,000 towards restoration and initial public access infrastructure costs) from the Grand Victoria Foundation. The cave sciences community, including the Subterranean Ecology Institute, the



Illinois Clean Energy
community foundation

National Speleological Society and the Illinois Speleological Survey, made donations of nearly \$4,000. An additional foundation also contributed \$5,000 to this acquisition.

Finally – and taking the necessary fund-raising for the purchase over the top -- generous members of our local communities provided more than \$40,000 to this effort: an outstanding example of *local faces who cherish great places*.

Over the next few years, row-cropped acreage on the tract will be converted to savannah-like prairie habitat, and an accessible, handicapped-friendly trail system for public passive recreation will be established. In the interim, we will begin to host special tours for Clifftop members later this year.

Almost immediately a science monitoring effort will begin on the property. Since this will be the largest cave groundwater recharge area surface restoration project ever undertaken in Illinois, we want to ensure that long-term monitoring and research occurs. These efforts should result in new practical guidance for our ability to "live on karst" while ensuring that quality groundwater allows the continued endurance of subterranean life forms that must "live within karst." Happily, grant money already is in place to establish baseline water quality measurements even before restoration begins.

In addition to changes in groundwater quality, scientists from the University of Illinois, the Illinois Natural History Survey, the Illinois State Geological Survey, and the Illinois State Museum are launching studies to examine changes in cave and terrestrial fauna during restoration and to reexamine the treasure trove of paleontological materials in the cave system. Researchers from these institutions and additional researchers from Southwestern Illinois College and Southeast Missouri State and Clifftop volunteers also will lead studies to establish baseline inventories of terrestrial flora and fauna species and follow change in populations for long-range views of the effects of our restoration efforts.

So, incredible to think, Illinois' largest, most biologically-diverse and important cave system now will be preserved through a huge land restoration effort led by an all-volunteer, small organization of dedicated conservationists -- Clifftop. Local faces **can** protect great places.

GRAND VICTORIA
FOUNDATION

Conservation Value of the Fogelpole Cave Drainage Basin

By Steven J. Taylor, Ph.D.
Illinois Natural History Survey
University of Illinois

With the purchase of the Seibert property, Clifftop expands its role as a key land management organization atop Illinois' Salem Plateau, a sinkhole plain karst landscape.

Understanding Karst

Karst topography is shaped by the dissolution of limestone bedrock through the action of slightly acidic water and subsequent mechanical enlargement through abrasion by water-born sand and gravel to form voids in the bedrock beneath the soils. These voids serve as conduits for rapidly flowing water, much like storm sewers in a city, and can gradually enlarge over geological time to form subterranean drainage basins—stream networks flowing unseen beneath the earth. These underground streams receive water through surface drains, expressed as sinkholes, where enlarged cracks in the bedrock allow water and often soil, organic debris, and even animals, to flow down into the subterranean stream. Like surface streams, these subterranean streams coalesce to form larger waterways. Depending on a variety of factors, including local water table, these streams may have air space over the water, or may be completely “pipe full.” In the case of the Seibert land, down-cutting of the Mississippi River and major tributaries has lowered the water table sufficiently for there to be ample air over the water, and the subterranean conduits are large, with several drains from the surface sufficiently developed as to allow entry by humans, and, thus, we have a cave.



Fogelpole cave in flood. Photo by Richard A. Young

Environmental Impacts

The presence of a well-developed cave stream in a karst landscape sets up a particular set of circumstances that repeat themselves in similar settings around the world, and caves developed in limestone plateaus are subject to similar geological, hydrological and ecological threats in almost any temperate-zone karst region of the world. These threats include a variety of impacts associated with things entering the subterranean streams via sinkholes, including (but certainly not limited to): garbage, leaking septic tanks, oil and gas leaks, fracking fluids, household chemicals such as pesticides and pharmaceuticals, road salts, compounds washing out of asphalts and dripping from vehicles, livestock wastes, agricultural chemicals and eroding topsoil. In Monroe County, I have seen evidence of all of these negatively impact cave streams. Above ground (surface) streams are readily visible, so it is relatively easy to notice when factors are causing stream degradation, and communities and conservation organizations are more likely to take action. But within karst terrain, these impacts are invisible to most people and few voices express concern.

Cave Ecosystems

Cave ecosystems occur only where there is appropriate host rock and geological history to allow the formation of caves. In Illinois, this means that caves are largely restricted to areas where limestone bed-

rock lies at or very near the surface. Such areas are localized and completely isolated from other similar blocks of karst terrain. For example the Salem Plateau of St. Clair, Monroe, and Randolph counties contains numerous caves, but these have no connectivity with caves found further north in the area between Alton and Quincy. To a lesser degree, a lack of connectivity also can be found within Illinois' Salem Plateau karst region. For example, the northern end of the Salem Plateau near Columbia contains a major subterranean drainage, which is completely disconnected from the cave systems further south such as Illinois Caverns and Fogelpole Cave south of Waterloo. These differing scales of isolation have been consistent features of long periods of geological time, with significant impact on genetic structure, isolation of species populations, and even speciation.

Caves provide unique conditions: very high humidity, complete darkness, low energy inputs (no sunlight, no photosynthesis), and relatively constant temperatures. Organisms that have locally adapted to these conditions often become specialized to the point that these are the only conditions in which they can live—these are cave-limited species. These animals are so well adapted to the cave environment that they cannot disperse to unconnected karst regions through other habitats. For these highly cave-adapted species, the landscape between karst regions has been uninhabitable over vast spans of geological time, and through numerous changes in surface vegetative habitats—changes happening, for example, as the landscape passes through glacial episodes. Organisms constrained in this way—by a high degree of adaptation to the cave environment and by a lack of capacity to disperse to other, unconnected, karst areas—may become so specialized as to become narrowly endemic species, found only in one or a few caves. Such is the case in numerous karst landscapes in the United States and elsewhere, where we see small areas of isolated karst with a list of endemic native cave species found nowhere else in the world. To me, this is something worth protecting, even before we consider specific species and ecological communities that are found within the caves.



This cave feature was produced as a result of the 1811-1812 New Madrid Seismic Zone earthquake and is a "living witness" to the earthquake. Photo courtesy Sam Panno, Illinois State Geologic Survey.

In addition to cave-limited species, caves and, especially cave entrances, can provide a refuge for species less well adapted to current conditions. In our area, the cool, moist, relatively constant conditions of cave entrances and twilight zones likely provide habitat for species that might otherwise not be able to survive in Illinois. Examples of this occur elsewhere in the world—cave entrances in northern California provide habitat for a fern species that otherwise only occurs hundreds of miles to the north, and a new species of nettle living only in the entrance and twilight zones of caves was recently described from China. Similarly, the cool moist canyons of the Mill Creek Natural Area in Randolph County, purchased by Clifftop and Heartlands Conservancy in 2012, host populations of glacial relict plant species, usually found only much further north.

Land Protection Efforts in Karst

Karst terrains have been widely recognized as valuable and unique. In Illinois, there are numerous examples of protected karst, such as Illinois Caverns State Natural Area, Stemler Cave Woods Nature Preserve, Armin Krueger Speleological Nature Preserve, Pautler Cave Nature Preserve, Burton Cave Nature Preserve, Twin Culvert Cave Nature Preserve, Guthrie Cave Land and Water Reserve, Brainerd Cave Land and Water Reserve, Cave-in-Rock State Park and Cave Hill Research Natural Area. Most relevant is the 27-acre Fogelpole Cave Nature Preserve, which is surrounded by the Seibert property. Though small, this

Nature Preserve helps to protect Fogelpole Cave—the same cave which underlies the Siebert property, and acquisition of the Seibert property significantly expands protection of the Fogelpole Cave drainage basin.

With only limited funds and other resources, land managers attempting to protect cave ecosystems have purchased cave entrances, as was the case for Fogelpole Cave Nature Preserve. But with more detailed and thoughtful examination, scientists, conservationists, land managers, landowners and cavers have demonstrated that the appropriate conservation unit is actually the entire cave drainage basin. This is true of above-ground preserves as well, where small forest preserves of relatively pristine nature have streams which are heavily impacted by upstream land use practices. But in caves, there is no forest, and instead there is only the cave stream and, mostly, the subterranean riparian zone. In protecting a cave, we are conserving habitat that occurs in a tube, with no sprawling landscape of forests and prairies. Everything that impacts that tube has an impact on the cave. Thus, the concept of protecting the entire drainage basin is much more important in protecting subterranean ecosystems.

Significant steps have been made in protecting caves and karst groundwater systems in the Salem Plateau through the persistent efforts of conservationists, land managers, agencies, and others. The Stemler Cave drainage basin in northern Monroe and southern St. Clair counties, Illinois, is an excellent example of long-term efforts. The original protection was only for an approximately one-acre area around the entrance of Stemler Cave, which was dedicated as Stemler Cave Nature Preserve. Later, IDNR and INPC were able to obtain additional land immediately upstream (underground!), dedicated as Stemler Cave Woods Nature Preserve. In recent years, another tract of land in the upstream drainage basin was obtained by the state, adding still more acres of protection to this sensitive area. Through these efforts, significant progress has been made in documenting the resources of the Stemler Cave drainage basin.

Organizations involved in Karst Conservation in Illinois

Along with the recognition of karst lands through formation of parks & preserves, a variety of groups have recognized the high conservation value of karst protection. In addition to Clifftop, karst-specialized Illinois organizations such as the Illinois Speleological Survey, the Subterranean Ecology Institute and additional conservation groups have had a hand in karst conservation in our state, including Great Rivers Land Trust, The Nature Conservancy-Illinois, the Illinois Audubon Society, and Friends of Stemler Cave Woods.



A Pleistocene-era bone field within Fogelpole Cave; specimens shown here are archived at the Illinois State Museum. Photo courtesy Sam Panno, Illinois Geologic Survey.

National agencies, such as the National Park Service, the US Geological Survey, the Forest Service and the Bureau of Land Management, all have employed full-time specialists working in karst systems because they recognize the unique and fragile nature of these landscapes and caves and the organisms within them. Congress has even mandated a National Cave and Karst Research Institute, further highlighting the importance of karst terrains. In addition, the US Congress passed The Federal Cave Resources Protection Act of 1988, which serves to “secure, protect, and preserve significant caves on Federal lands for the perpetual use, enjoyment, and benefit of all people.” Even at the State level, there is regulatory support for cave and karst resources through the Illinois Cave Protection Act and, in the case of cave waters upstream and within Nature Preserves, the potential to designate Class III Groundwater. This Special Resource Groundwater is a unique classification for areas determined by the Illinois Pollution Control Board to be “demonstrably unique...”, “...vital for a particularly sensitive ecological system...” or “...groundwater that contributes to a dedicated nature preserve...”

Fogelpole Cave

Above, I've outlined some compelling reasons for recognizing the importance of caves and karst systems, and shown how numerous agencies, organizations and individuals have worked towards protecting these fragile resources in Illinois. Why, then, should we bother with one more cave drainage basin, that of Fogelpole Cave?

Fogelpole Cave has long been recognized as the largest cave in Illinois at 15 miles in length, more than twice as long as the next longest cave in the state. While few people have had the good fortune of being able to visit the cave (the main entrance is gated and locked to protect fragile cave resources, including endangered species), the main passage is truly impressive—a large stream flows through the cave, pouring downstream into the blackness. Unlike more easily accessible caves, there is little in the way of damage from graffiti or breakage of cave formations. Fogelpole Cave contains a variety of unique resources: ancient Pleistocene sediments have been dated by researchers at the Illinois State Geological Survey, allowing us to better understand the history of Illinois and cave development. Dating formations in Fogelpole Cave has provided insights into past climatic conditions, and breakage patterns examined in light of the great 1812 New Madrid earthquake. The cave is also home to two federally listed species. The Indiana Bat, *Myotis sodalis*—presently under dire threat from the spread of White Nose Syndrome—utilizes Fogelpole Cave both as a winter hibernaculum and as a probable summer maternity roost. Another bat found in Fogelpole Cave, the Northern Long-eared Bat (*Myotis septentrionalis*), has now been proposed (2 October 2013) for listing as endangered due to the threat of White Nose Syndrome. Perhaps most relevant to the conservation value of the Seibert land, is the presence of the Illinois Cave Amphipod (*Gammarus acherondytes*), in the waters of Fogelpole Cave. This endangered shrimp-like animal occurs only in select caves in Monroe County (having been extirpated from one site in St. Clair County). The Illinois Cave Amphipod exists nowhere else in the world, and is thus vulnerable to environmental perturbations that impact water quality. Through habitat protection, we can sustain and improve the conditions for the Illinois Cave Amphipods' survival. Achieving this protection requires appropriate actions, at the level of the broader surface landscape, to protect shallow groundwater quality.



Joe Kath, IDNR, and Joe Merritt, INHS, examine an Indiana bat in Fogelpole Cave. Photo by Steven J. Taylor

The Fogelpole Cave ecosystem contains many other interesting, cave-adapted organisms that will benefit from Clifftop's careful stewardship. Sliding along on submerged rocks is a completely white, cave-limited flatworm. Four other species of amphipods are also present in the cave stream, as well as a cave snail, aquatic worms and pale, elongate groundwater isopods. Almost none of these aquatic animals are able to persist in surface environments—they need the caves to survive.

The terrestrial habitats of the cave also harbor a variety of animals, although our knowledge here is somewhat lacking—in addition to the Indiana and Northern Long-eared bats, several other bat species also use the cave as a hibernaculum and as a summer roost site. This is not the case for all caves in the sinkhole plain of Monroe and St. Clair counties, as many of the caves flood to the ceiling during heavy rains. Fogelpole Cave is special in that the very large passage of the mainstream never floods to the "pipe full" stage (except far, far downstream), though some side passages surely do. This means there is a persistent terrestrial environment that is occupied by a variety of small organisms able to survive upon organic debris that has washed into the cave. These animals include a variety of springtail species, several kinds of flies, cave-adapted mites, diplurans, millipeds, beetles, pseudoscorpions, and spiders. Closer to the entrance, cave crickets may be found, and, during the winter, the attractive moth *Scoliopteryx libatrix* overwinters in the cave. Recent studies of several nearby caves in

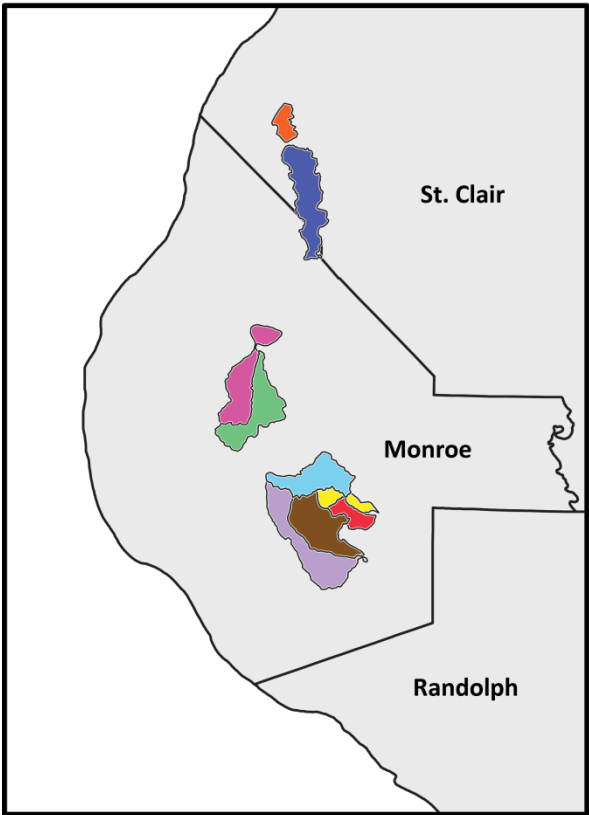
Monroe and St. Clair counties have resulted in the discovery of four springtail species new to science. It would not be at all surprising if, with intensive study, we find still more new springtails, or other invertebrates, in Fogelpole Cave.

Importance of this Land Acquisition

The Seibert property overlays a significant portion of the Fogelpole Cave groundwater basin, mostly upstream of the Fogelpole Cave Nature Preserve. Boundless opportunities exist here for outdoor recreation, education, and scientific research. The purchase of the Seibert property is a critically important step towards protecting one of Illinois’ most vulnerable habitats and our largest cave system. It helps protect Class III Groundwater upstream of a nature preserve, and further protects a major portion of the entire range of a federally listed endangered species, the Illinois Cave Amphipod. In my opinion, this is one of the most important conservation actions taken to date towards the protection of our subterranean heritage in Illinois. The abundance and diversity of microhabitats on and under this land is important for all wildlife – birds, mammals, reptiles, amphibians, fish, snails, mussels, insects, arachnids, and other invertebrates, not to mention plants, fungi, and various unicellular organisms. Responsible land use in the purchase area will provide opportunities to demonstrate implementation of state-of-the-art management practices, serving as a model for other landowners in this important karst region. With the purchase of the Seibert property, Clifftop makes a huge step in conservation, outreach, education and science, beginning a legacy for the local community that will enrich lives far into the future.



Cave formation within a portion of the Fogelpole Cave System that underlies the Seibert property.
Photo courtesy Bob Weck, Biology Dept. Chair, SWIC



The area’s major recharge basins atop the Salem Plateau.
Map courtesy Steven J. Taylor, INHS



A big thank you goes out to all our members and special friends who supported Clifftop’s acquisition of the Seibert property, both through financial contributions and moral support! We salute you!

An additional thank you is extended to those members who responded positively to our annual renewal appeal letters that were mailed in mid-December. If you haven’t yet renewed your membership, please consider doing so at your earliest convenience. We appreciate your support!



Did you know?



...that Illinois Caverns was a big hit with St. Louis World's Fair goes in 1904, but that it is now closed to the public due to the threat of humans spreading white-nose syndrome, a fungus that can kill bats?

...that the nature preserve and the groundwater recharge area contributing to the Stemler Cave contains a total of approximately 4,582 acres, of which, 2,515 acres is karst landscape?

...that the Armin Krueger Speleological Nature Preserve near Burksville is a privately-owned 105-acre site?

...that the Pautler Nature Preserve is located in west central Monroe county, about 2 ½ miles west of Waterloo?

...that the Burton Cave Nature Preserve, located near Quincy, IL, was formed by the continuous infiltration of groundwater through layers of limestone which is known as a solution cave?

...that the Twin Culvert Cave Nature Preserve, located in Pike County, near Pearl, IL, is a cave of the Driftless Section of the Middle Mississippi Border Natural Division and is owned and stewarded by The Nature Conservancy?

...that the Guthrie Cave, located near Giant City State Park in Union County, at over two miles in length, is one of the largest caves in southern Illinois?

...that Brainerd Cave is located in upland forest within Pere Marquette State Park?

...that the cave at Cave-in-Rock State Park, located in the eastern section of the Shawnee National Forest, served as a backdrop for a scene in the 1962 movie "How the West Was Won"?

...that there is a cave within the Cave Hill Research Natural Area known as Equality Cave that is an example of a maze cave?

Fall burn season photo gallery

All photos this page, courtesy Mike and Joann Fricke, Clifftop



← Fricke burn 11/10/2013 →



↑
White
Rock
Burn
11/16/2013
← →



← Salt
Lick
Burn
11/14/2013 →



Fall Burn Season

Short and sweet, but productive, describes the six-day fall burn season of 2013. It began on Sunday, November 10 at the Fricke property near Valmeyer, south of Route 156. Approximately 20 acres of upland forest was burned to control invasive woody plants like bush honeysuckle and sassafras. The burn unit was bounded by permanent fire breaks of an old logging road, pipeline easement and personal driveway. Photo 1 on the previous page shows burn boss Debbie Newman instructing a first timer in lighting. Photo 2 proves how valuable a driveway can be as a fire break. The 10 person volunteer crew was rewarded with ham & beans, corn muffins and brownies around a campfire after mop-up.

Four days later, a crew of 20 plus descended on a burn unit of about 90 acres at Salt Lick Point Land and Water Reserve. Now, half the reserve has been burned in just under two years. After a briefing in the parking lot where assignments were handed out, the volunteers were deployed, requiring numerous UTV's and other vehicles. Some had to enter via the Village of Valmeyer, while others motored up the trails to their appointed positions. Those lighting led the way, followed by volunteers with rakes, flappers, water packs and leaf blowers, all the while watching both in front and behind for spotovers and problem areas. Photo 6 on the previous page shows a volunteer watching a tree that is burning in multiple areas, making sure it doesn't fall outside the burn unit. Photo 7 indicates how fire roars up hill as the high tannin of oak leaves fuels the flames.

Before the rain and snow began to fall, one last burn took place on November 16 at White Rock Nature Preserve. 27 volunteers gathered to set fire to a 1-acre hill prairie, several brush piles and 30 acres of upland forest and talus slope. Preparation was crucial to this prescribed burn and required 120 volunteer hours. As with the Salt Lick burn, assignments were given out in the parking lot before volunteers were ferried to their appointed locations by UTV. Four different subordinate burn bosses oversaw the staggered lighting of the fire, the most precarious of which was the talus slope. Photo 3 on the previous page shows one crew watching the fire burn a good black line from on top of a ridge before lighting the head fire in the ravine. Photo 4 is a view of the hill prairie being set ablaze with a view of the vehicles of the volunteers parked on Harris Road. Photo 5 indicates how well the talus slopes burned.

Upcoming events...



Archeology of the Bluffs & Bottoms

will be presented on Saturday, Feb. 15 from 1 to 3 p.m. at the Monroe County Annex in Waterloo. Speaker will be noted local amateur archeologist, Merrill Prange, with special guest speaker, Dennis Knobloch. For reservations, email clifftop@htc.net or call (618)458-4674 by Feb. 13

Full Moon Owl Prowl is scheduled for Saturday, March 15 from 6 to 8 p.m. at the White Rock Land and Water Reserve. Watch for details in local papers and on our website: www.clifftopalliance.org.

