

**PAUTLER NATURE PRESERVE MANAGEMENT PLAN**  
a project of the



**FINAL DRAFT**  
**APPROVED BY THE KCI BOARD OF DIRECTORS 11/09/03**

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## **INTRODUCTION**

The Karst Conservancy of Illinois (KCI) is a not-for-profit corporation founded in 1998. It is dedicated to conserving karst resources primarily in the state of Illinois. KCI emphasizes the protection, management, and acquisition of karst environments.

The historic entrance to Pautler Cave is about three miles west of Waterloo. The cave is an entrance to a longer system that is over six miles in surveyed length. The complete cave system is currently the third longest cave known in Illinois, and the mapping is not yet complete.

The cave and surface area are managed as a biological preserve and natural area. The cave entrance also provides access to major underground streams for monitoring water quality and assessing the effectiveness of environmental education and regulation in part of the Waterloo Karst. The KCI intends to limit visitation to researchers and volunteers monitoring the condition of the cave.

## **HISTORY**

KCI obtained permission to enter the cave in April 2000 and began a mapping project. Bretz and Harris (1961) described Pautler Cave in *Caves of Illinois* as having a large, rectangular cross-section passage similar to Illinois Caverns and Fogelpole Cave. This description is accurate for most of the known cave passage.

The property once belonged to the Pautler family, who owned much of the land between Waterloo and Valmeyer. The area around the cave is shown on older topographic maps as an orchard. The entrance is adjacent to what is believed to be the original wagon road connecting Valmeyer and Waterloo. The previous owners purchased the property as a building lot.

There had been no known visitation to Pautler by cavers or local residents for about thirty years before KCI entered into negotiations to buy the property. In fact the previous owners had done all that they could to obliterate the entrance. It was worked over with a bulldozer, reportedly to keep people out of the cave. Numerous large trees were toppled and a great deal of silt was shoved down into the entrance pit in the process. Management of the entrance area will include efforts to return it to a more natural condition.

The major effect of these past activities has resulted in protection of the cave system. It survives in nearly pristine condition. For this reason alone, KCI sees no advantage to the cave in making it accessible to casual visitors.

The entrance was lost to organized caving until Philip Moss and Diane Tecic relocated it with the help of a former owner, Richard Hutchings. The cave was included in the Illinois Natural Area Inventory based on collections made by Dr. Stewart Peck. KCI purchased the lot in December 2000 and gated the cave in March 2001. The property was approved for dedication as an Illinois Nature Preserve in August 2001.

## RESOURCES

Pautler Cave was formerly known in the literature primarily for its fauna. It is now also known to be part of a more extensive cave system, which includes several caves and springs that have been shown to be connected by groundwater tracing. Much passage remains to be mapped and inventoried. Other known entrances to the system are difficult for researchers to use because many obstacles prevent easy traverse.

## Biology

Dr. Stewart Peck made biological collections in the cave in 1965 that were published in Peck and Lewis (1978). An outstanding fauna includes *Gammarus acherondytes*, *Ergodesmus remingtoni*, *Caecidotea packardi*, and an undescribed species of *Chaetaspis*. In 1999, Dr. Julian Lewis, Philip Moss, and Diane Tecic made biological collections in Pautler Cave and several nearby caves that are hydrologically part of the same cave system.

The species of management concern for Pautler Cave are listed below. Management concern was defined by Lewis *et al.* (1999) as G1, G2, or G3-ranked species, using the global rarity ranking system employed by The Nature Conservancy and other conservation agencies. The species listed below are all globally rare. The list comes from a report to the Illinois Field Office of The Nature Conservancy by Lewis *et al.* (1999), who reported this system as having the greatest known number of troglobites of any cave system in Illinois.

The ecological terms used to describe species of management concern are defined for reference:

trogloxene: cave “visitor” that leaves the cave to feed or reproduce

troglophile: facultative cave dweller that may live and reproduce in caves

troglobite: an obligate cave dweller that lives and reproduces only in caves

### Species of Management Concern in Pautler Cave

*Sphalloplana hubrichti*, G3, – Hubricht’s cave flatworm (troglobite)

*Helicodiscus* undescribed species, G1, – terrestrial snail (trogloxene)

*Carychium riparium*, G3, – floodplain terrestrial snail (trogloxene)

*Caecidotea packardi*, G3, – Packard’s cave isopod (troglobite)

*Bactrurus brachycaudus*, G3-G4, – eastern Ozark cave amphipod (troglobite)

*Gammarus acherondytes*, G1, – Illinois cave amphipod (troglomite), Federally listed as endangered

*Chaetaspis* undescribed species, G1 – cave milliped, (troglomite)

*Ergodesmus remingtoni*, G1, – Illinois cave milliped (troglomite)

*Austrotyla specus*, G3-G4, – eastern Ozark cave milliped (troglophile)

*Arrhopalites hirtus*, G2, – hairy cave springtail (troglomite)

*Arrhopalites* undescribed species, G2, – cave springtail (troglomite)

*Tomocerus missus*, G2, – relict cave springtail (troglomite)

*Eumesocampa* undescribed species, G3, – cave dipluran (troglomite)

*Haplocampa* undescribed species, G2, – cave dipluran (troglomite)

### **Species of Management Concern Elsewhere in the Cave System**

The cave system (the subterranean stream network that includes Pautler Cave and other caves and springs) contains the species listed above and also those species listed below:

*Chthonius virginicus*, G3, – Virginian pseudoscorpion (troglone)

*Arrhopalites ater*, G2, – black Medusa cave springtail (troglomite)

*Arrhopalites lewisi*, G2, – Lewis' cave springtail (troglomite)

*Ceuthophilus williamsoni*, G3, – Williamson's camel cricket (troglone)

Some of the above species may be found in Pautler Cave with additional investigation. Other, more common species have been identified from Pautler Cave and associated caves. They are listed in Lewis *et al.* (1999), which was not an exhaustive study. More species probably will be found if more bioinventory work is conducted in the cave. Very little is known about the life history of any of these species. KCI intends to provide access to qualified biologists to study the ecology and life history of the fauna of this system.

### **Geology**

Pautler Cave is in the Waterloo Karst, which in turn is part of the larger Southwest Illinois Karst. The region is part of the Salem Plateau, and the rocks exposed are Mississippian in age. The cave is formed in the St. Louis Limestone as mapped by Weller and Weller (1939). The cave entrance is in a sinkhole that slopes down to a 15-foot pit, formed as a result of passage collapse (Moss, 2001).

The region was glaciated by the Illinoian advance. Till was deposited directly onto the karst surface. Following the retreat of the ice, a mantle of loess was blown onto the karst from mudflats located in the adjacent Mississippi Valley. More loess was blown in during the Wisconsinan stage. Loess thins away from the Mississippi River but is as much as 40 feet thick in the Pautler Cave area.

The cave has a significant amount of travertine that has not been vandalized.

## **Hydrology**

The hydrology of the Pautler Cave system is relatively well studied. It lies within a karst area that has only internal, subsurface drainage. Leakage from the upstream portions of Fountain Creek and sinking streams about one and one-half miles south of Pautler Cave contribute water to the system. However, most of the water in the system is transmitted through sinkholes. The previous owners reported that the historic entrance occasionally floods. This is probably due to back-flooding from a body-sized constriction and breakdown blockage just downstream from the entrance area.

Delineation of the Pautler Cave groundwater system was conducted by the Ozark Underground Laboratory (OUL) in 2000 and 2001 under contract to the Illinois Nature Preserves Commission with funding from the U.S. Fish and Wildlife Service (Aley *et al.*, 2001). OUL conducted two dye traces in the Pautler system and two nearby traces in 1996 and 1997. This was followed by more intensive dye tracing by OUL. All of the relevant traces are reported by Aley *et al.* (2001). The subterranean stream in the Pautler Cave System flows through the Camp Vandeventer Karst Window and discharges at Camp Vandeventer Spring and Ice Box Cave. There is an overflow connection with the Annbriar Spring groundwater system that lies to the west.

In addition, considerable water quality data from Camp Vandeventer Spring have been collected by Illinois State Geological Survey and Southern Illinois University Edwardsville staff.

## **Paleontology**

No significant paleontological material has been positively identified from Pautler. Some bone deposits are known in the system, but they generally have not been investigated as to species and age. A raccoon skeleton of unknown age lies at the bottom of the entrance pit. Two bones have been identified as white-tailed deer of unknown age (R. Toomey, personal communication, 2000). KCI intends to provide access to qualified paleontologists to study any paleontological deposits in this system.

## **Archaeology**

No archaeological material is known from the cave. Above the entrance is an old road bed that probably was used in the mid-1800s. Some of the adjacent sinks may contain archaeological material that migrated from the roadway. KCI intends to provide access to qualified archaeologists to study any archeological materials associated with this property.

## **ACCESS and DEED RESTRICTIONS**

The property has access via a subdivision road and has public water to the property line from the Fountain Creek Water District. There are deed restrictions in the subdivision, but none seems to conflict with the goals of KCI. The deed restrictions permit utility easements as shown on the plat. Fences must be no more than four feet high and at least ten feet from roadways. They must consist of plants, masonry, or wood. They may not be metal or tight boards.

Access to Pautler Cave is by permission of the KCI Board. Visitation must further the purposes of KCI and may include trips for mapping, photo-documentation, biology, paleontology, groundwater studies, or other valid research and monitoring efforts as determined by the Board and as advised by its Advisors. The Illinois Nature Preserves Commission (INPC) is obligated to inspect Pautler Nature Preserve every other year.

Pautler Cave has been gated to control access. Since the cave entrance is in a subdivision, residents need to be protected from the hazard of going into the cave without proper gear or in inappropriate weather conditions. KCI also wishes to protect the cave from vandalism and the effects of over-visitation. No one has been allowed in the cave for about 30 years, so no groups with a history of entering the cave are being locked out.

Visitors (researchers, surveyors, and those performing monitoring or other conservation duties) may be required to sign a release attesting to their relevant expertise and willingness to forgo any claims that they may have against KCI as a result of their access to the property.

## **DEDICATION as PAUTLER NATURE PRESERVE**

KCI has dedicated the property as an Illinois Nature Preserve. Dedication does not change ownership. It is an irrevocable legal document that states that the property's highest and best use for all time is preservation. Enforcement of that dedication is through INPC. The recharge area for Pautler Nature Preserve can be designated Class III groundwater with special regulations, and these regulations are enforceable by the Illinois Environmental Protection Agency. The dedication allows the Illinois Nature Preserves Commission and the Illinois Department of Natural Resources to contribute both money and labor to the management and study of the cave. The Illinois Nature Preserves Commission consults with KCI on the management plan.

## **PUBLICITY**

KCI will encourage researchers, volunteers, and regulatory agencies to be aware that the cave exists and that access is possible. The cave management plan may be used in fundraising efforts.

## **MANAGEMENT**

### **Cave Management**

When managing a cave, one must not assume that the management plan is effective; the cave should be monitored for degradation. KCI will evaluate the desirability and practicality of various monitoring strategies. The strategies include, but are not limited to, photo-monitoring, water quality monitoring, and periodic censusing of indicator species. In order for degradation to be noted, a baseline condition must be established as soon as possible. Currently there is minimal water quality data from Pautler Cave, although its main discharge point, Camp Vandeventer Spring, has been sampled frequently by the Illinois State Geological Survey and geologists from Southern Illinois University Edwardsville. A study of the water quality at Camp Vandeventer Spring is currently being conducted by a Southern Illinois University graduate student as part of his Master's thesis.

### **Surface Management**

KCI intends to maintain the surface in a manner compatible with the residential subdivision. The grassed areas may be restored to native vegetation. A small parking area has been constructed. Camping is prohibited by deed restriction in the subdivision and by *Rules for Management of Illinois Nature Preserves*.

### **Scheduled Management Tasks**

Both one-time and periodic management tasks at Pautler Cave are presented below. The one-time tasks are indicated by the list, and the routine tasks are numbered. The one-time tasks have been completed except for the first and last ones.

- Removal of trash from the property.
  - Stabilization of the dead trees over the entrance pit.
  - Construction of a small parking area.
  - Construction of a screened area for changing clothes.
  - Creation of a researcher-friendly route from the Pautler entrance into the main stream along with appropriate access control.
- 1) The gate will be inspected for vandalism monthly.
  - 2) To ensure access control, the lock on the cave gate will be replaced periodically.
  - 3) Censusing of indicator species will be conducted in odd-numbered years starting in 2001.

- 4) A photo-monitoring program may be instituted to assess human impact to the cave as well as natural changes.
- 5) Water quality may be monitored at selected locations in the cave system. The parameters will include total coliform, turbidity, pH, specific conductivity, temperature, triazines, optical brighteners, dissolved oxygen, and total petroleum hydrocarbons.
- 6) The property lines will be marked and then inspected quarterly for encroachment and condition of the boundary signs.
- 7) Exotic flora will be removed as needed.

## **FUTURE OPTIONS**

KCI does not intend to transfer its ownership of Pautler Nature Preserve to another party. If circumstances force that outcome, KCI shall seek a like-minded organization for transfer of ownership.

## REFERENCES

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