W 453-E

Landowner's Guide to Caves and Cave Ownership in Tennessee

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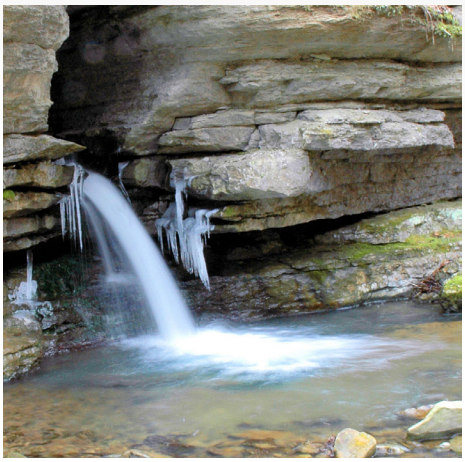

Figure 1. Historic water supply cave in Fentress County

According to the Tennessee Cave Survey, Tennessee has more than 10,000 caves, which is more than any other state in the country. That's approximately 20 percent of all known caves in the country. Our caves offer incredible diversity in many respects. Whether big or small, deep or shallow, or even filled with water, all of our caves harbor unique resources of some type. Most provide habitat for cave-adapted animals, some shelter artwork and even footprints from prehistoric peoples, and some contain remnants from more modern adventures like mining for gunpowder ingredients in the 1800s, moonshine stills and even dance halls.

All Tennessee caves are distinctive, and more than 90 percent are located on private property. Caves are generally out of sight and out of mind, but their future, and the future of the resources they contain, lies squarely on the decisions made by Tennessee landowners. This primer on cave ownership is designed to help landowners make informed decisions regarding cave management and the future use and protection of cave resources on private lands. Other information about Tennessee caves and sinkholes can be found in the series of publications, W 453-A: Guide to Caves and Sinkholes in Tennessee.pdf.

Cave Resources

Cave resources can generally be divided into two categories: natural and cultural.

Natural resources in caves include things like:

- Biological
  - Bats — Eat a lot of insects in the summer and are a farmer's best friend. The value of bats to Tennessee agriculture is estimated to be above $313 million annually.
  - Invertebrates (insects and arachnids) — Tend to be very regionally unique; many species are known from only one cave or a few caves in close proximity.
  - Tennessee Cave Salamander — The official Tennessee state amphibian.
  - Cave Fish — Are blind and colorless, living their entire lives in complete darkness in Tennessee's underground waters.

- Groundwater
    - Because of Tennessee's often fractured and porous bedrock, water can move very rapidly underground and can quickly transport contaminants.
    - Caves and sinkholes are generally direct connections to groundwater and springs and can have drastic effects on water quality, including wells, if not protected and suitably managed.
- Minerals
    - Gypsum — Gypsum is a soft sulfate mineral that occurs in many Tennessee caves. In some it appears to have been mined extensively by indigenous people.

Figure 2: Indiana bats hibernating in a Tennessee Cave

Cultural Resources can include a variety of features:

- Prehistoric
    - Petroglyphs and pictographs — artwork on rock walls or in the mud.
    - Trace evidence — Some Tennessee caves contain evidence of prehistoric use, such as footprints, river cane torch fragments, or gypsum mining.

These are extremely fragile, so when you are near them, please refrain from touching them.

- Historic — Tennessee caves have always been a great place to spend a hot summer day.
    - Saltpeter mining — Many Tennessee caves contain evidence of saltpeter mining: vats, wooden ladders, wooden water pipes, etc. Saltpeter was used to make gunpowder, and Tennessee caves provided a lot of it during the War of 1812 and the American Civil War.
    - Moonshine stills — Efforts to outwit "revenuers" led many Tennessee moonshiners underground. Evidence of their still sites remains today.
    - Community events — Several Tennessee caves have been used, and often modified, for social venues such as dances and band recitals.

These resources and many more are sheltered within Tennessee's privately owned caves. As a cave owner, the future of these resources is often in your hands. Because cave resources are underground and can be difficult to observe or recognize, they are often negatively impacted by human activity, without malice or ill intent. Examples include incompatible livestock or forestry techniques impacting cave ecology and people unknowingly walking over prehistoric footprints in the mud.

Management

Cave resources are not always easily identified by the untrained eye. Biological resources like bat roosts are generally seasonal, and cultural resources can be obscure and not easily recognized. It can go unnoticed, but cave resources are greatly impacted by land management above ground as well. In the following section, we will provide suggested best management practices for caves and cave resources.

Seasonal Recommendations

- *Bats* — Tennessee cave bats most often use caves for hibernation in the winter. Our cave bats breed in the fall around cave entrances and then hibernate from October through early April. This is a critical time for bats as they have limited fat reserves to survive the winter, and many are battling a disease known as white-nose syndrome. *People should generally avoid entering winter bat caves from* ***September 1 through April 15***, especially those with clustering bats. We also have some bats that use caves in the summer. Gray bats are an endangered species and exclusively use caves to raise their young. These caves are often recognized by large guano piles within the cave or large numbers of active bats in the summer months. Gray bats are extremely sensitive to human disturbance, and *these caves should be avoided from* ***April 15 through September 1***.

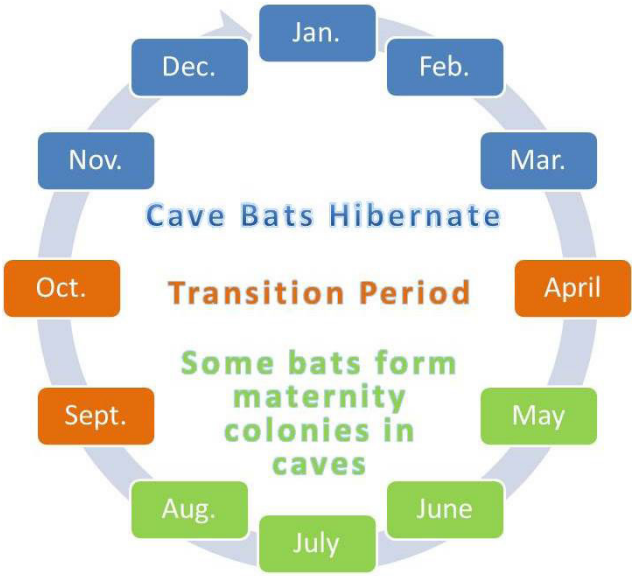

Figure 3: General bat cave seasons

General Recommendations

- *Cave Entrances* — Entrances should be kept as natural as possible. *A minimum undisturbed radius of 200 feet is recommended around caves and sinkholes* to buffer water entering the system and to provide shelter and forage for the many animals that use caves. Cave entrances should remain open as cave airflow can be critical to some animals. Bat-friendly gates that don't restrict flight or airflow can be established at high-priority sites.

- *Visitation* — Caves can offer great adventure or simply a comfortable place to cool down or warm up depending on the season. Recreational caving is a popular activity in Tennessee. Anytime humans enter a cave, we have an impact. The general principles of "Leave No Trace" work well in caves, and landowners are encouraged to deter vandalism and understand the resources in their caves that may warrant added protection. Many caves harbor bat colonies, which warrant seasonal closures or access restrictions. In most caves, some level of visitation is quite acceptable. It helps broaden our knowledge of caves in Tennessee and can advance critical research as well as build interest in caves by the public, including future scientists and land managers.

- *Land Management* — Maintaining a healthy cave ecosystem often depends on the same conservation techniques that apply to good land management above ground. Key objectives include limiting erosion, changes to hydrology, and pollution. Maintaining mature native trees (or native grasses in some areas of Tennessee) above a cave is especially useful in soil conservation. Caves are often open conduits for water flow, and without extensive root systems above them are prone to soil loss, which often leads to sinkhole formation.

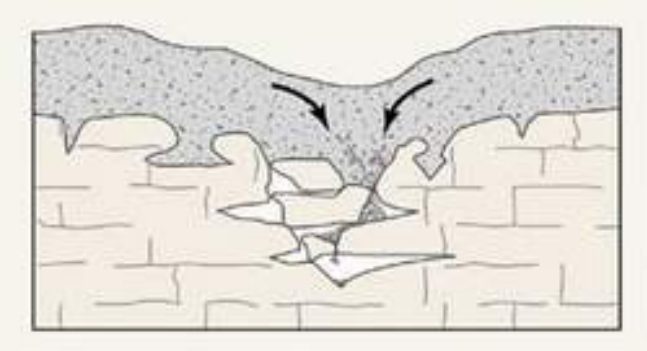

Figure 4: Soil subsidence in the absence of tree roots

Examples of Specific Management Recommendations

- *Caves with hibernating bats in forested landscapes*
    - Cave entry discouraged between September 1 and April 15.
    - Maintain undisturbed buffer zone of at least 200 feet around entrances and sinkholes
    - If harvesting timber, clear-cutting is discouraged and sediment control measures are essential .
    - Selectively manage as needed for other cave resources.
- *Caves with summer gray bats in agricultural landscapes.*
    - Cave entry discouraged between April 15 and September 15.
    - Use extra caution around cave entrances in May and June when baby bats are young and nursing.
    - Maintain undisturbed buffer zone of at least 200 feet around entrances and sinkholes.
    - Employ soil conservation practices such as no till planting and rotational grazing.
    - Apply chemicals, including fertilizers, at the minimum amount required to meet your goals.
- *Caves with no known significant resources*
    - Maintain undisturbed buffer zone of at least 200' around entrances and sinkholes.
    - Employ land management techniques designed to minimize soil erosion.
    - Implement land management practices that minimize potential for pollutants.
    - Discourage vandalism, interior modifications and general overuse of the cave.
    - Work with researchers, scientists, cavers, etc., to investigate potential cave resources.

Legal and Liability Responsibilities As a Cave Owner

There are two distinct Tennessee laws that are designed to protect Tennessee caves and Tennessee landowners. The nicknamed "Tennessee Cave Law" (Tenn. Code Ann. § 11-5-108 [2015]) pertains to the vandalism of caves and provides general protections to cave resources. Additionally, there is a series of laws that relate to landowner liabilities in Tennessee that name "caving" as one of the recreational activities outlined in the laws. These are Tenn. Code Ann § 70-7-101, Tenn. Code Ann § 70-7-102, Tenn. Code Ann § 70-7-103, Tenn. Code Ann § 70-7-104, and Tenn. Code Ann § 70-7-105. This series of codes is nicknamed the "Tennessee Landowner Liability Law" and generally protects Tennessee landowners from liabilities relating to injuries or accidents occurring as the result of land use by others.

Conclusion and Additional Resources

Tennessee caves provide a bonus landscape for unique wildlife to thrive, water to move, and they shelter geologic wonders and glimpses of human history beneath the lands we own and manage today. By following some basic principles we can safeguard these resources and be good stewards of our Tennessee lands and waters.

The following links can help you learn more about Tennessee caves and cave resources. There are many additional opportunities available through local universities, caving groups and conservation organizations.

TN Bat Working Group: TNBWG.org

Caving Groups: nssio.org/Find_Grotto.cfm

White-Nose Syndrome: whitenosesyndrome.org

W 453-B: Best Management Practices for Livestock Production and Operations in Karst Areas: extension.tennessee.edu/publications/Documents/W453-B.pdf

W 453-C: Karst Geology in Tennessee: extension.tennessee.edu/publications/Documents/W453-C.pdf

The Nature Conservancy

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