

# Cave Owner's Newsletter

*A publication of the Virginia Cave Board, Department of Conservation and Recreation*

**No. 13, March 2000**

## Management of New Cave Discoveries

by Philip Lucas

Virginia Speleological Survey

There are over 3600 known caves in Virginia. These caves are described in the files of the Virginia Speleological Survey (VSS). I have been fortunate to hold the position as President of the VSS and have acquired some knowledge about our Virginia caves. Often caves are very important resources. The nature of their existence and their contents covers a wide spectrum of the sciences. Many caves are a direct conduit down to the groundwater. They are geologic windows to the bedrock itself. A cave is like a time capsule holding its contents in an unchanging environment. For many people, caves are wonderful places to visit and can inspire the imagination. But they can also be delicate places that are easily damaged.

Major cave discoveries have been made in recent years and many of these resulted from digging to uncover cave entrances. Geologists strongly suspect that most caves do not have an entrance. Some caves have had entrances in the past but are now sealed off or collapsed due to geologic processes and more recently by early settlers who filled in "holes" as they established their farms.

Deducing where a cave entrance might be opened is not so difficult. Some of these former entrances now collapsed still have the shape and appearance of an entrance. The knowledge of a former entrance may be remembered by an "old timer." A place where flood water disappears may have been an entrance. A hole that blows warm air or a place where the snow never seems to lay are good possibilities. Caves often blow or suck air that passes through tight cracks and crevices. Sometimes a groundhog-size hole can have quite a draft of air blowing from a cave.

The effort involved in opening an entrance can be just a few minutes of moving rocks and dirt. Some cave digs are done on a much larger scale and have

taken years of removing tons of material. Nonetheless, remarkable discoveries have been made. In fact, in recent years some of the largest caves in Virginia have been found by opening new entrances.

Digging into a new cave is a very exciting event. Almost always, the cave discovered by digging will be virgin, unvisited by humans. At times, we have found evidence of visitation by Native Americans where they gained entry through an entrance that no longer exists. But finding "virgin" cave is usually the case. Cavers discovering virgin cave and seeing places that no one has ever seen before can be compared to a mountain climber being the first to reach the top of a mountain. It is the challenge, and mystery that inspires and motivates cavers to put their energy into digging for many hours or hundreds of hours to find what they consider a buried treasure. One of the special things about discovering virgin cave is its pristine state. Many times, these caves contain very unusual mineral formations and other features that are unspoiled and untrodden.

Cavers recognize the value of these pristine caves and will go to extraordinary lengths to protect them. Trails are established so a careless footprint will not needlessly trample a crystalline growth. Certain areas are flagged off to protect tracks made by long extinct animals. Cavers are usually careful that the existence of this cave is not publicized and not spread beyond the caving community for fear that someone untrained and inexperienced might visit the cave and cause irreparable harm.

Obviously I am a caver, but I am also an owner of property where several caves are located. As a property owner, I have been very fortunate to have discovered a new cave on my property. This cave was discovered by digging. There is a fissure on a hillside that had an area of broken rocks that blew



**Figure 1:** A dense cluster of stalactites and helictites in a Virginia cave. These formations are extremely fragile and take hundreds to thousands of years to grow.

cold air on a hot summer day. The dig for this cave took place over several years and finally revealed an entrance to a very large cave. There are over six miles of passageways surveyed (so far) and it has very special, but fragile, features (Figure 1). When we dug into this new cave, I immediately began managing and protecting the discovery.

What can we do as owners to manage our caves? Especially those new caves that have just been discovered or will be discovered. The only simple answer is that the owner should be involved in the management of his cave. The method of management will vary widely as circumstances involving the cave, the property, and the owner vary. There is no "one size fits all" management plan. Some caves can be protected simply by owners direct involvement with visitors to his cave. This works well where the owner lives on the property and will be contacted by those wishing to visit his cave. Some owners may chose to have a gate placed on the entrance. This provides the owner optimal control of

who visits the cave. Installing a gate may seem to be a good solution but it is not without its drawbacks. Not all entrances are easily gated and gates can be expensive and hard to install. Some caves are stream inputs (sinking streams) and a gate in this type of entrance would simply acts as a filter and quickly become clogged with debris, sealing the entrance. Many caves contain populations of bats and if a gate is not designed correctly (bat friendly), the gate will prevent the bats from using the cave as their home. Some owners, particularly absentee land owners, have elected to have a caving organization or a group of cavers help in managing their caves. Sometimes the best method is a combination of both.

The most important thing is that the cave should be managed. This is especially true for those newly discovered caves that contain delicate formations or features. Owner should know as much as possible about their caves even if they do not personally visit them. They should understand caving even though they have no desire to explore caves themselves. Those untrained and unskilled in cave exploration can cause great harm to the cave's environment. Cavers who are members of the National Speleological Society (NSS) have had opportunities to gain the necessary experience and training.

Here are some tips that will help you decide if the parties might have the necessary experience and training to enter your special new cave:

- Are they members of the NSS? Do they know what the NSS is?
- Ask them what caving club they belong to. Most NSS caving clubs are called grottoes, e.g. Blue Ridge Grotto.
- Do they all have helmets and lights that attach to the helmets?
- Are they wearing boots and not tennis shoes or low cut shoes?
- Do they each have a caving pack that contains among other things, two separate backup light sources with extra batteries? Some experienced cavers use carbide lamps.
- Do they have additional items in their cave packs such as drinking water, candy bars etc., some sort of an emergency kit, nylon webbing, carabiners (aluminum snap rings) and so on.
- Are they using gloves and perhaps nylon coveralls?

- Are they carrying rope when you know the cave to be horizontal or are they not carrying rope if the cave is vertical? (Cavers carry rope only when it is needed.)
- Are they carrying canteens and hunting knives on a belt loop? Are they carrying hand held flashlights or lanterns? These things are not used by cavers.
- If they have a ball of string to unwind in the cave, they are untrained and unexperienced.
- In conversation with them are they familiar with some terms that most cavers would know? For example:

What is the **NSS**? (National Speleological Society)

What **mineral** are formations such as stalactites, stalagmites made of? (calcite)

What is a **totem**? ( a tall slender stalagmite)

What are **rimstone pools**? (pools created by calcite terraces or dams)

Is anyone **going carbide**? (This means using a carbide lamp for a light source)

Does anyone use a **rack**? (This is a rapelling device attached to a seat harness that the rope slides through)



## Did you know . . .

Saltpetre (nitre, potassium nitrate) was mined from at least 100 Virginia caves from early colonial times through the Civil War Era. Some of our caves still contain mining artifacts, saltpetre mounds, pick and tally marks, signatures, and other evidence of mining activity. Cave management includes the proper protection of these historical resources.

### Review:

## *Living on Karst:*

### *A Reference Guide for Landowners in Limestone Regions*

This publication of the Cave Conservancy of the Virginia is an excellent information resource for the cave landowner. If you are beginning to plan to manage your cave or karst resources, or just want more information on what may be happening right under your own feet, you will probably want to read this short, but informative, booklet. One of the important things to consider is that your actions or lack of action can have tremendous impact miles and miles away. This guide will help you think of ways that you can help protect your land and the water resources surrounding you.

*Living on Karst* is written in simple terms and contains pictures and diagrams that help explain what goes on underground. There are 23 topics covered: here are just a few:

- What is Karst?
- Pollution and Protection of Karst Wells and Springs
- Water Well Tips
- Sinkhole Management Protects Property Values
- Erosion and Sediment Control
- Reducing Runoff Pollution in Karst Areas
- Pasture Land and Grassland Management
- Pesticides on the Home and Farm
- How's Your Septic System Doing?
- The Forest Landowner and Water Quality
- Household Wastes
- The Wise Use of Water
- Helpful Hints for the Cave Landowner
- Cave Protection Options Available to Landowners

To obtain a copy of *Living on Karst: A Reference Guide for Landowners in Limestone Regions*, contact:

Cave Conservancy of the Virginias  
13131 Overhill Lake Lane  
Glen Allen, Virginia 23059  
(804) 798-4893

Please note that a copy of this publication was mailed with the last *Virginia Cave Owner's Newsletter* (No. 12, December 1998).

# Planning Guide for Cave and Karst Land Management

by Tim Kilby

Managing a cave or karst landscape begins with planning. A good management plan need not take a lot of time or effort or cost a lot of money. You can create a plan yourself or have cave experts help you along the way. Then, when time comes to put your plan into action, you can do it yourself, have others help you with management, or place the management entirely in the hands of a responsible organization.

There are many issues that you should consider as you prepare a management plan for your cave resources. What are the specific characteristics of your cave that need protecting, and what actions and policies need to be implemented? To what extent will you allow your cave to be used by others? Who will see that the management plan is carried out? These are but a few of the questions that will be answered in a cave management plan.

Most of the larger and better-known caves of Virginia are managed according to a plan. You may wish to see one or two of these plans for ideas. However, a plan that a landowner across the ridge or down the valley creates for his cave may not be appropriate for you and your cave. Every cave is unique. A customized management plan provides peace of mind for you and your family, as it protects the underground resources in your charge.

## Take Inventory

Begin by taking inventory of the cave's resources. Does your cave have any of these resources?:

- **Geologic** - unusual formations, long passages, large rooms, vertical shafts, uncommon minerals, sinkholes or other surficial features.
- **Biologic** - fungi, bats, woodrats, birds, crickets, frogs, salamanders, blind fish, crayfish, beetles, bugs, microscopic creatures.
- **Hydrologic** - water sink, streams, waterfalls, pools, reservoir or water supply.
- **Historic** - saltpetre mining artifacts, markings or signatures, religious or recreational gathering

place, hiding place, other characteristic of historic significance.

- **Archeologic** - burial site, artifacts, ancient markings or mud glyphs.
- **Paleontologic** - bones of prehistoric animals, fossils.
- **Recreational** - previously used for tours, used by cavers.
- **Economic** - potential for commercialization.

Seek the help of qualified specialists to obtain an accurate and complete inventory. An example, a plan for a cave that is home to the rare Indiana Bat would be quite different from one where common brown bats are all that are present. Members of the Virginia Cave Board may already know many of the details of your cave, or they can advise you as to how best to take inventory, doing so discreetly to protect your private interests. Finally, make provision in your plan to monitor these resources in subsequent years. This will help you gauge the effectiveness of your management plan or perhaps call for revisions.

## Control Access

Your cave management plan should specify every detail of your access policy. It's best to settle on an access policy that first considers the needs of the living cave, the cave's role in the lives of its inhabitants and the environment. Next, of course, your access policy should reflect the degree you and your family desire "quiet possession," the legal term for landowner rights to enjoy your property without outside interference. However, your access policy should finally consider the needs of others that want access for scientific, educational, or recreational reasons.

Access may be controlled through physical barriers (gates, fences, buildings) and/or legal and policy barriers (posting "no trespassing" signs, seasonal closing). There are examples of all of these in the Virginia/West Virginia area. Board members will be happy to discuss the pros and cons of each

approach. Blasting an entrance closed should not be considered because it destroys wildlife habitat, disrupts drainage patterns, and permanently bars entrance to those with *bona fide* need for access.

### Protect Drainage Areas and Water Sources

Considering the land use above a cave or karst drainage region is as important in a management plan as are all others. Establishing buffer zones around entrances, sinkholes, and springs helps prevent harmful runoff from entering underground drainage systems. (See article on buffer zones in this newsletter.) Your plan should account for moderation or elimination of these activities within buffer zones:

- Timbering
- Livestock grazing, pens, or feed lots
- Locating poultry and hog facilities
- Applying fertilizer or pesticide
- Disposing of trash
- Storing gasoline, oil, or chemicals

Your water quality and that of your neighbors and area depend on wise land use. Drafting a management plan can help you identify potential problem areas and long-term solutions.

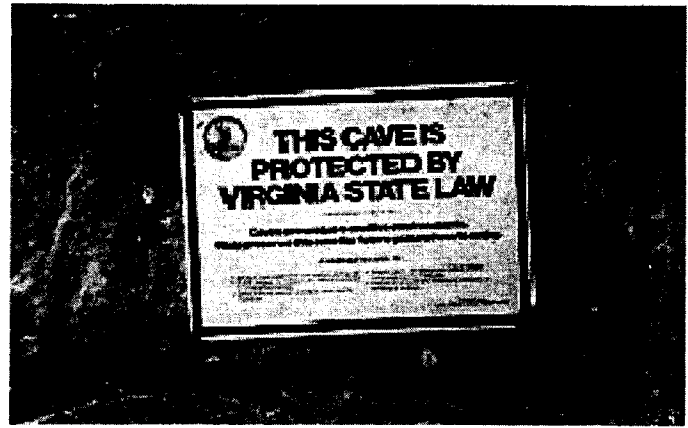
### Legal Protection and Risk Management

In your management plan, address the measures you will take to legally protect yourself and your cave. The Virginia Cave Protection Act provides limited liability protection under certain conditions. This law also protects caves from vandalism and signs have been placed inside many of the significant caves in Virginia informing visitors of the law (Figure 2). However, if your plan calls for physical barriers or cave modifications, the liability provisions of the Act may not apply. The Act also provides stiff penalties for harm to the cave or cave wildlife. Your management plan should specify policies and actions that support the state and federal cave protection laws. Consult a qualified attorney.

Even with careful management and favorable laws, you may be at financial risk. Assess any financial risks and account for these risks in your plan. Most management plans do not increase your risks; therefore, your current homeowner's umbrella or farm insurance may be sufficient. Consult your insurance agent or risk management professional.

### Implementing Your Plan

A formal cave management plan will include all the policies and provisions and a timetable for



**Figure 2:** Sign posted inside New River Cave, informing cavers that this cave, as well as all others within the Commonwealth of Virginia, is protected under the Virginia Cave Protection Act. This Act also provides for limited liability protection for the landowner.

implementing the plan. You may need help now and in years to come to make sure the plan is followed and the cave is protected. It's a sure bet that volunteer help is available: conservationists, individual cavers, caving clubs, conservation organizations, and Board members. Make sure that all interested parties are aware of your access policies. Responsible cavers will respect your policy and help with its enforcement.

### Management Alternatives

Some cave owners are dedicated to the protection of their cave and recognize its ecological, natural, scientific, and recreational value; but they just do not have neither time nor interest to manage the cave. These owners use any of a variety of management alternatives. Paid and unpaid managers, managing organizations, gifts of deed, conservation easements, and land trusts are some of the methods used. Each of these has different objectives and effects that can include tax relief, elimination of liability, and perpetual management and protection.

### Virginia Cave Board Can Help

Members of the Virginia Cave Board have experience and expertise that could be helpful to your cave management planning. The eleven-member Board may advise, assist individually, or recommend qualified experts that can help you as you draft a management plan. Contact any member directly, or write the Virginia Cave Board, Virginia Department of Conservation and Recreation, Division of Natural Heritage, 217 Governor Street, 3rd Floor, Richmond, Virginia 23219.

# Managing a Significant Cave: One Landowner's Story

by Tim Kilby

Owner of New River Cave, Giles County, Virginia

When I purchased land containing New River Cave in Giles County in 1989, I already had plans for conserving the cave for present and future use. The cave has been popular with sport cavers for over fifty years; its geologic, biologic, historic, and recreational resources are well known. New River Cave is classified "very significant" by the Virginia Speleological Survey, but it was in danger of being lost to vandals and neglect. Though the story is still unfolding, the first attempt to manage New River Cave in an intentional way is paying off.

## Gathering Information

Before deciding on how New River Cave should be best managed, I needed information, lots of information. Why and how was the cave significant? Was the cave really worth saving? What were the problems that endangered the cave or visitors? How could I best protect the cave? What would it cost and what were the legal issues?

I began collecting information and talking with cavers and cave experts about the problems specific to New River Cave. Visits to a lawyer and my insurance agent gave me the peace of mind to proceed. I had enough information to create a plan for managing the cave.

## Establishing a Plan

Some cave owners prefer to have a particular group or organization manage their cave for them. In this case a formal management plan should be drafted and followed. As the sole owner/manager of this cave, I did not feel the necessity to write a management-plan document. Instead, I just decided on what needed to be done and a timetable for accomplishing the initial goals. In hindsight, I should have prepared a simple plan document.

Uncontrolled access was the major problem that needed immediate attention, for the benefit of the cave and the safety of those wishing to enter. Because endangered species of animals were not present, and because I too appreciated the tremendous recreational and educational value in the

cave, I did not want to close the cave entirely. My management plan called for a phased approach to solving the problems.

## Informing Others and Enforcing Access Policy

The first step was to spread the word of my plan as wide and far as possible. This is actually quite easy to do. Just ask cavers to tell other cavers. Whenever I identified individuals or groups that wanted to go caving in New River Cave, I informed them of the controlled access policy and asked them to tell others as well.

Next, I needed to vigorously enforce my access policy. Of course, there are caves with such rare species or fragile formations that it's best to keep them closed. This is not the case at New River Cave. Those that cave safely and responsibly are welcomed; those that trespass or destroy the cave are not (*see* Figure 2 in previous article). In a few selected cases I had the unpleasant task of taking trespassers to court. However, the vast majority of visitors supported my policy. My message to Virginia cavers: respect all landowners and respect the land as well.

## Supporting Educational, Scientific, and Conservation Uses

Another part of my cave management plan is to support educational and conservation efforts. I openly welcome cave visitors that are conducting scientific projects. For example, scientists from Radford University have conducted geologic dating experiments and students from North Carolina participate in classes in speleology there. Cavers from many states recently conducted extensive exploration and surveying at New River Cave. The data and the map will help scientists to better understand formation of caves in this region.

Conservation is a major focus of the management plan. In order to protect the cave for future generations, each visitor is asked to do something to help conserve the resources. Groups decide for

themselves what they want to do. Most pick up litter or scrub graffiti (Figure 3), but a few others plan more extensive conservation efforts. I ask all visitors in some way to leave the cave in a condition better than when they arrived.

### Successes and Failures

As a result of the management plan for New River Cave, conditions have improved for both cave visitor and the ecosystem. Informal counts show that the bat populations have increased steadily since access has been limited. The cave is virtually free of trash, most highly visible graffiti has been removed, and current visitors keep it clean and natural looking. The wealth of scientific and historic information mounts. Regrettably, there are still trespassers that endanger themselves and the cave; we continue to battle that problem and weigh the advantages and disadvantages of a gate at the entrance. All in all, this plan has been successful. I am convinced that managing caves according to a plan helps protect Virginia's valuable underground resources.



**Figure 3:** *Cavers of the National Speleological Society cleaning graffiti and removing trash from the Big Room in New River Cave. All visitors are asked to leave the cave in a better condition than it was when they arrived.*

## Buffer Zones for Effective Management of Caves and Karst

by Ernst H. Kastning, Ph.D.

Department of Geology, Radford University, Radford, Virginia

A basic approach in protecting caves and groundwater in regions of karst is to ensure that the effects of human activity on the surface are minimized in the subsurface environment. Effective management of caves and other underground features requires that areas on the surface that readily contribute significant quantities of water to the subsurface be identified and adequately protected.

One good conservation practice is to establish natural buffer zones around sinkholes in order to maintain the quantity and quality of water entering the ground and recharging aquifers in the karst. The size of a particular buffer zone should be determined through careful assessment of surficial features such as sinkholes and sinking streams and inventory of caves, springs, and wells in the area.

Care must be taken to prevent the introduction of toxic substances into sinkholes because they serve as discrete points of recharge to underlying karstic aquifers. Common sources of contamination include runoff containing chemical and agricultural wastes from both urban and rural areas, accidental spills of hazardous materials, and dumping of wastes directly into sinkholes. Sinkholes may be simply viewed as funnels that concentrate both surficial runoff and undesirable chemicals into subsurface voids and into well-integrated networks of flow (e.g. caves and fractures that easily and rapidly transmit water to points of discharge such as springs and wells).

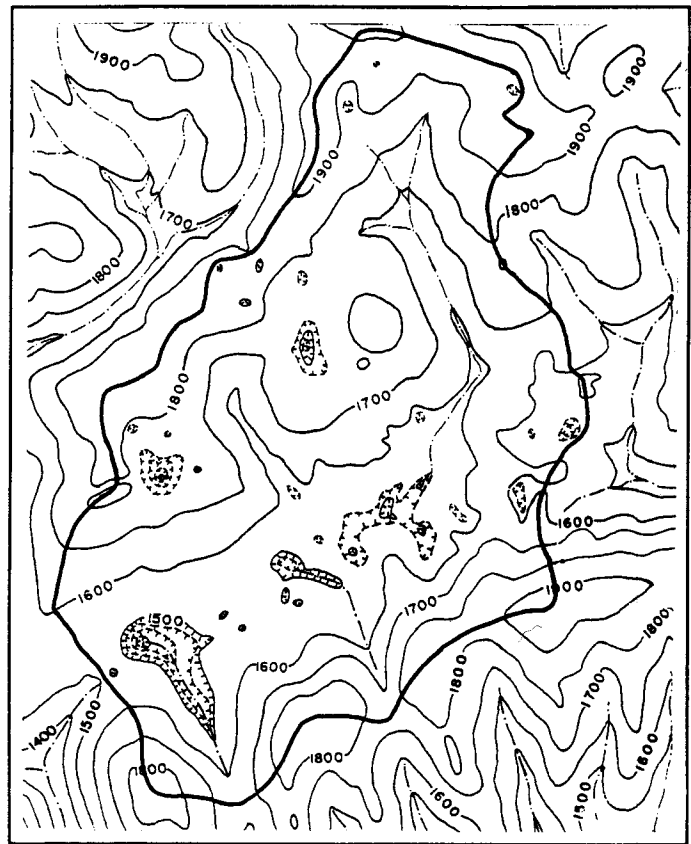
Water that enters a particular sinkhole may originate on the surface over an area that is much larger than the area of the sinkhole itself. For

example, a small stream flowing overland may suddenly enter a sinkhole (Figure 4). Clearly, any contamination introduced into the stream will be transmitted into the ground through the sinkhole. Therefore, the stream must be protected. This necessitates that the stream be included in the buffer zone.

Surface water may also enter a karstic aquifer through numerous vertical fractures in the bedrock, even if these openings are not visible beneath a soil cover. Therefore, it is common that water is transmitted to a karstic aquifer even if it percolates into the ground between sinkholes or in their proximity. Moreover, even though karst terranes may not exhibit well-defined sinkholes, there may still be a considerable influx of surface water to caves and other conduits in the aquifer. In these cases, such recharge conditions must be included within a designated buffer zone. For example, much of the area within the internally drained area outlined in Figure 4 might be included within a buffer zone with respect to specific types of land use.

Once an effective buffer zone has been identified, best management practices for the land within the zone may be formulated. This would entail a balance between desired land use and protection of caves, groundwater, and the subsurficial environment.

Groundwater conditions in karst terranes are often complex and not readily identified. However, advice is available from experts who are familiar with karst processes. These include cavers, local geologists, and members of the Virginia Cave Board.



**Figure 4:** Topographic map of some sinkholes in Scott County, Virginia. Note that streams from higher elevations (including some flowing from non-cavernous rock) enter sinkholes. The heavy line outlining the sinkholes and contributing streams encloses all of the land that drains into the sinkholes. (scale: 1 in = 2000 ft)

## Members of the Virginia Cave Board

For additional information, please contact the **Virginia Department of Conservation and Recreation, Division of Natural Heritage**, 217 Governor Street, 3rd Floor, Richmond, VA 23219 or one of the following members of the Virginia Cave Board:

**Mr. Robert T. Barns**  
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**Note:**

The Virginia Cave Board consists of eleven appointed members. At the time of publication of this newsletter, three vacancies remain to be filled.

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