A Guide to Responsible Caving

Published by The National Speleological Society

photo by Joe Levinson

A Guide to Responsible Caving

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who wishes to remain anonymous.
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National Speleological Society Web site.

FOREWORD

We explore caves for many reasons, but mainly for sport or scientific study. The sport caver has been known as a spelunker, but most cave explorers prefer to be called cavers. Speleology is the scientific study of the cave environment. One who studies caves and their environments is referred to as a speleologist.

This publication deals primarily with caves and the sport of caving. Cave exploring is becoming increasingly popular in all areas of the world. The increase in visits into the underground world is having a detrimental effect on caves and relations with cave owners.

There are many proper and safe caving methods. Included here is only an introduction to caves and caving, but one that will help you become a safe and responsible caver. Our common interests in caving, cave preservation, and cave conservation are the primary reasons for the National Speleological Society. Whether you are a beginner or an experienced caver, we hope the guidelines in this booklet will be a useful tool for remembering the basics which are so essential to help preserve the cave environment, to strengthen cave owner relations with the caving community, and to make your visit to the cave a safe and enjoyable one.

This is the third and completely revised edition of *A Guide to Responsible Caving*. A special thank you to my fellow cavers for their hard work and dedication: Cheryl Jones and a gentleman who wishes to remain anonymous for revising and editing this publication, and Michael Dale for the design and layout work.

Adrian (Ed) Sira NSS 11904 FE

photo by Joe Levinson

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photo by Bob Biddix

BACKGROUND

Introduction

Whether you are a beginner or an experienced caver, these guidelines introduce you to the basics of responsible caving. These basics help preserve the cave environment, strengthen caver-landowner relations, and make your visit to a cave a safe one.

This booklet describes how to take care of the cave and how to take care of yourself and your partners. Although proper and safe caving practices are discussed, this discussion is no substitute for personal instruction by a competent caver.

Tolerating misery

Do you really want to go caving? If so, ask yourself why. Caving is not a spectator sport, and it tends to be cold and muddy. Tight passages and long crawls are common, too. The dangers include falling down pits, being crushed by falling rocks or collapsing passages, drowning, and hypothermia. And then there is the possibility of getting lost and quickly dying of hypothermia or slowly starving to death. Traveling to caves can be time-consuming and expensive, and the gear isn't inexpensive either.

Why people visit caves

People visit caves for many reasons, but mainly for pleasure or science. Non-cavers may know cavers as spelunkers, but most responsible visitors to caves prefer to be called "cavers." Speleology is the scientific study of the cave environment, and one who studies caves is a speleologist.

What do cavers do underground? They survey the caves and make maps, they study the geology and biology, and they clean up caves and repair broken formations. The knowledge they gain helps environmental and land-use planning.

Responsibility

You and your partners are responsible for protecting yourselves, other cavers, and the caves you visit. We're all in this together. You don't want your actions to cause other cavers to remember you as "that caver who got killed" or "that caver who was careless and irresponsible around formations." Being a responsible caver involves planning a trip, moving through the cave, and returning safely, on time.

Formation of caves

A cave is a natural void under the earth's surface, and most caves are formed in soluble rock, usually limestone. A solution cave is formed when rock is dissolved by slightly acidic water. Terrains that show evidence of solutional caves are called "karst." Caves are also formed in lava by volcanic processes, and these caves are called "lava tubes."

Characteristics of caves

Some caves have passages that extend for many kilometers, but most caves are much shorter. Many caves are damp and muddy, although some are dry and dusty. Caves may contain walking-sized passages, crawlways, constrictions, or tall narrow canyons. Often they contain streams, lakes, waterfalls, pits, or domed ceilings, and some caves are subject to flash flooding.

Water has sculpted the rock walls, rocks have fallen from ceilings and walls to form piles of breakdown, and streams have left mud or sand along their banks. Floors can be muddy, sandy, rocky, or gravelly.

The temperature of most caves is the long-term average of the surface temperatures above the cave. Therefore, caves closer to the equator are warmer than caves farther from the equator, and those in lowlands are warmer than those in the mountains.

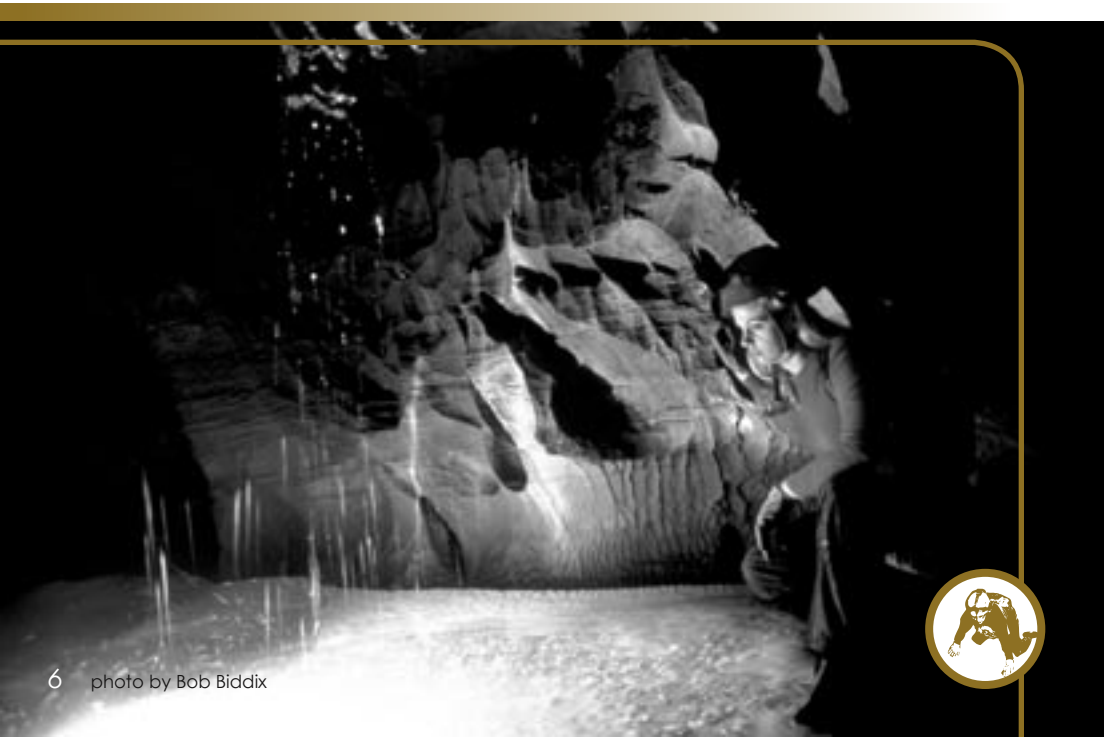


 photo by Bob Biddix

Speleothems

Water containing dissolved minerals seeps through the rock, creating formations, or *speleothems,* on the floors, ceilings, and walls of caves. Most often these speleothems are composed of crystals of calcite or gypsum, but they often incorporate other minerals that impart color. Speleothems include stalactites, stalagmites, helictites, draperies, pearls, flowstone, rimstone, and columns. Speleothems grow slowly, sometimes for thousands of years, and because of changes in weather or surface drainage, some are no longer growing at all.

A single careless touch or malicious gesture can destroy what may have taken hundreds, or even thousands of years to form, and once damaged or destroyed, speleothems may not regenerate at all. Mud from a caver's glove or boot can remain forever as an ugly stain.

Take special care to avoid damaging speleothems. Remain on established trails in a cave, be careful where you place your hands and feet, and keep your helmet away from speleothems on the ceiling. Only through such responsible caving will irreplaceable speleothems be preserved and protected.

Cave life

Caves afford transitory or permanent sanctuary for a range of organisms. The variety of life in a cave is small and more fragile than most life on the surface. Avoid disturbing a cave's inhabitants, and treat them with respect.

Troglobites

Cave-dwelling organisms that spend their entire lives underground are called "troglobites." Some troglobites have no skin pigment and are blind. Troglobites include fish, salamanders, crayfish, insects, and spiders. They are specially adapted to living in darkness, and they offer biologists insight into biological processes, such as evolution. Troglobites cannot live outside a cave, and their survival may be threatened if the cave environment is damaged or altered. Water pollution, visitor traffic, trash, flooding, and a change in air patterns and temperature contribute to disturbing a cave's fragile food web and ecosystem. Once destroyed, there is little chance that these ecosystems would regenerate, and unique troglobites would be gone forever.

Trogloxenes

Animals that make their homes in caves, but return to the surface to feed including bears, packrats, snakes, raccoons, swallows, moths, and foxes are called "trogloxenes."

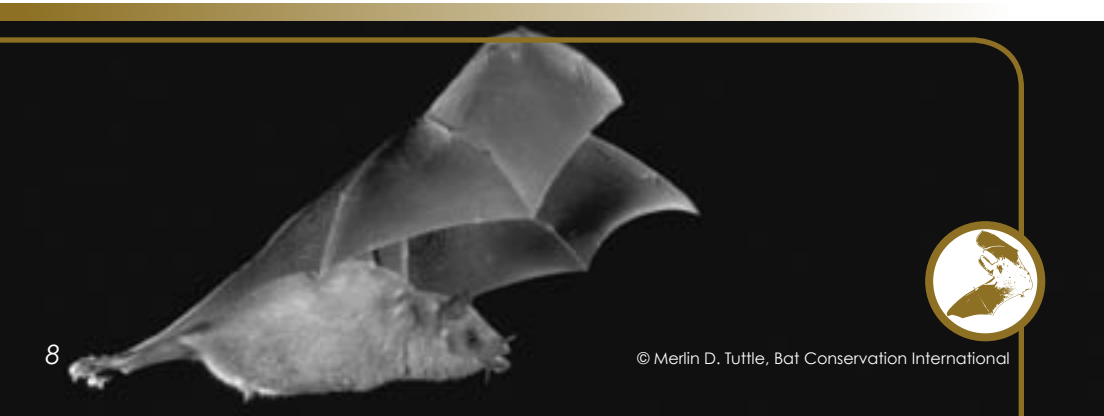
Bats

Bats are trogloxenes too, and they play important roles in surface ecosystems. Most bat species are insect eaters, and some bats eat half their body weight in insects each night.

You like bananas, cashews, mangos, and figs? Bats are also important pollinators of night-blooming plants, including these commercial fruits, not to mention eucalyptus and balsa. Fruit-, pollen-, and nectar-eating bats are essential to the survival of the rain forests through pollination and seed dispersal.

At some point in their life cycles, ⅔ of the 46 species of bat in the United States use caves, or cave-like structures, such as abandoned mines. Inside caves, bats give birth and rear their young in the summer and hibernate in the winter. Human interference has forced bats to abandon their homes for less suitable roosts, causing declines in bat populations.

Conscientious cavers avoid important bat caves in the winter to protect hibernating bats, and in the summer to protect mothers and young. Some of these caves are identified by signs at their entrances.



PROTECTING CAVES

Wilderness
Caves are the world's most remote and fragile wildernesses. They provide irreplaceable habitat for rare species.

Drinking water
Caves play a vital role in the quality of our drinking water. In karst and lava areas, surface water flows into caves quickly, after little filtration from their characteristically thin soil layers. This water and the pollutants it carries---human and animal waste, agricultural chemicals, petroleum products, and other contaminants---can travel great distances underground into wells, springs, and aquifers. These contaminants may pollute water that you end up drinking.

Archaeology
Since prehistoric times, caves have served as homes, burial grounds, and religious sites. Unlike most other environments, the nearly constant temperature and humidity of a cave can preserve some of our most sensitive archaeological and cultural sites for millennia.

Extremophiles
Biologists have discovered cave-dwelling *extremophiles* whose food web is based on *chemosynthetic*, or mineral-"eating" bacteria. These organisms offer clues about the earliest forms of life on Earth.

Modern threats
Many caves have existed for hundreds of thousands of years, but increasing land development has brought new threats to caves, including pollution, quarrying, and vandalism. Unfortunately, caves are threatened by human activities above and below the surface. Carelessness and ignorance, as well as intentional vandalism, can quickly damage a cave and its contents forever. A reward is offered by the National Speleological Society for information leading to the conviction of cave vandals anywhere in the United States.

Vandalism
Damaging a cave or its contents is against the law in most states, and on Federal land, such damage violates the Federal Cave Protection Act. In addition, if you buy speleothems, you help create a market that encourages both their collection and their destruction. Collecting even broken formations encourages others to collect unbroken ones. Don't be a vandal or encourage them.

Sharing cave locations

Do not reveal the location of caves to people whose regard for caves might result in harm. You are responsible for protecting both the cave and the people who might misuse your information. Increasing casual traffic in caves (by geocaching or posting locations on web sites, for example) is misusing cave location information. It leads to vandalism and degradation of the cave, and it can upset cave owners.

photo by Michael Carter

CAVING COURTESY

Landowner relations

Good relationships between cavers and landowners are an essential part of visiting caves, and maintaining these relationships is a key element of responsible caving. Sadly, many landowners now prohibit people from entering their caves as a result of inconsiderate actions by cave visitors, and others have placed locked gates on their caves.

Observe these fundamental courtesies to receive permission to enter caves, to be welcomed as a guest in the future, and to keep caves open for other cavers.

Permission

Before entering a cave on private land, obtain the owner's permission; that's what you'd want people to do if you were the landowner. A local caver or members of an NSS grotto can probably help you make the proper contact.

Manners

Introduce yourself and the cavers with you to the cave owners. Spend some time chatting; you may need to persuade them that you are competent, conscientious cavers. Thank them for their hospitality. Visit them again after returning from their cave, unless it is after dark. Be quiet, especially at night.

Open or closed, leave gates as you find them. Use gates, and avoid climbing fences. If you must climb over a fence, climb near a strong post.

Avoid disturbing livestock and walking across a planted field. Replace barriers that were placed at the cave entrance to keep livestock from falling in.

Many owners have never been in their own caves, so copies of photos and cave maps are often appreciated.

You may meet owners who flatly will not allow you into their cave. In that case, thank them for their time and leave.

Discretion
If you change clothes before or after your cave trip, find a private, sheltered spot.

Leave no trace
Leave the cave and the surface cleaner than you found it. Cause no damage to terrain or property.

Public land
Although some caves controlled by public agencies may be entered without prior permission, some require a permit. Contact the agency in advance to ascertain what is necessary to enter a cave, and allow time for a response.

Safety
Getting injured is no way to have fun, and caves are unforgiving of cavers who are careless or unprepared. However, if you are properly equipped and have the proper attitude and training, caving can be safe. Generally, caving accidents result from lack of experience or poor judgment. Poor judgment includes using improper or unfamiliar equipment, and lack of experience includes overextending yourself mentally or physically, which can lead to fatigue or hypothermia.

Beware unpredictable accidents, such as rocks falling from ceilings or ledges, which have been known to cause injuries and fatalities in caves.

 photo by Alan Cressler

WHAT TO BRING

Getting equipped

Every caving trip requires the same basic equipment and supplies. However, equipment for a safe and comfortable trip may differ from that listed here, depending on the cave. To learn what is appropriate, ask your trip leader, or ask a caver who is familiar with caves in the area where you are planning your trip.

Lights

Carry at least three independent sources of light per person. Mount the primary light on the helmet, so that you automatically have light wherever you turn your head and your hands are free to climb safely. The second and third light sources must be equivalent to the primary light. Spare parts, including batteries and bulbs, are necessary components of each source of light. Lights employing light-emitting diodes (LEDs) are now so inexpensive, small, and energy efficient, that their advantages outweigh those of candles and glow sticks, which have never been reliable or even adequate sources of light.

Helmet

Wear a helmet that meets standards of the *Union Internationale des Associations d'Alpinisme* (UIAA) or of the European Committee for Standardization ("CE") equivalent, and buckle the chin strap. Your helmet protects your head and offers a mount for your lights. When you buy an inferior helmet, you reveal the value you place on your life.

Other equipment

Depending on the cave and the trip, cavers also find these items useful underground:

- Gloves to keep your hands warm and minimize cuts and scrapes. Use gardening gloves, thick rubber gloves, or leather-palmed work gloves.
- A large, plastic trash bag, carried in your helmet. Wearing this bag can help prevent hypothermia, or it can keep you dry.
- Knee pads.
- Food sufficient for the length of the trip, and an extra amount in case the trip takes longer than expected.
- Drinking water.
- A crush-proof container for human wastes. Pack it in, pack it out.
- A small, strong, lightweight pack made from a fabric that does not absorb water.

Clothes and comfort

Caves tend to be cold, so dress warmly. Wet clothes keep you colder than dry clothes, so avoid getting wet. Except in the driest, warmest caves, avoid wearing cotton clothing, because it absorbs and retains more water than synthetic fabrics. Polypropylene, nylon, and polyester tend to be more abrasion-resistant, absorb less water, dry more quickly, and retain heat better than natural fabrics.

Dress for success

Dress for the expected environment in the cave. Layers of clothing made from synthetic fabrics are suitable for colder caves, while lighter clothing is sufficient for warm caves. The outer layer needs to be able to withstand the abrasive and sharp rocks of a cave. Some caves are so cold and wet that they require more than just layers of warm clothes; do not attempt such caves without proper training.

photo by John Ganter

Contingencies

From the local NSS grotto, which is a club, learn the telephone number to call when a cave rescue is necessary. Carry this number with you in the cave, and leave a copy in the car. Cave rescue is technical and difficult, and it requires special equipment, training, and skills.

Top cover

Notify a reliable person about your caving plans, including the name and location of the cave you are visiting, and your estimated time of return (allowing time for unanticipated delays). Agree what to do if you do not return on time.

If you exit the cave after your estimated exit time, contact your top cover as soon as possible to prevent an unnecessary rescue. Rescues result in bad publicity for cavers and for caving in general, and they may alienate cave owners and cause them to close their caves. An unnecessary rescue wastes the time and resources of many dedicated volunteers.

Landowner education

Educate landowners about the value of their caves. Specifically, point out how polluting a cave can affect their groundwater, and explain how anything dumped in a sinkhole can damage underground ecosystems. Make them aware of the biological, historical, prehistorical, and aesthetic value of their caves. Refer to Caving Courtesy on page 11 for more guidelines for landowner relations.

Protect caves by protecting the surface

Just as you maintain underground resources by packing out your own trash and that of others, keep sinkholes free of rubbish. Even though you may not see a cave entrance, trash (including dead animals) dumped in a sinkhole can enter and harm a cave ecosystem. It can also pollute the water that drains to underground streams and natural reservoirs that supply drinking water to people. Keep surface areas near entrances free of sources of pollution, too.

Before entering a cave

When you might be tempted to cut corners on gear, preparation, or training, ask yourself how much your life is worth. If you cannot afford the proper equipment, then you cannot afford to go caving.

- Confirm that your equipment is appropriate for the cave.
- Check that the lights work as they should, and that you have packed fresh, spare batteries.
- Ensure that the cave and the trip you anticipate do not exceed your experience level, your equipment, your preparation, or your ability.
- Have a plan for the trip, and know what to do if something goes wrong.
- Obtain as much information as possible about the cave before you enter.
- Plan to head out of the cave when you have consumed no more than one third of the batteries for your primary light. In general, exiting takes longer than entering, and your trip out of the cave will tire you more than the trip in. Plan to exit the cave with at least one third of your primary light's batteries unspent.
- Know how your equipment works. Do not plan on figuring out your gear underground.

photo by Ron Simmons

Teamwork

Responsible caving is a team activity and not a competition. Responsible cavers think and act as a unit underground to ensure a safe trip. The actions or attitude of a single member can jeopardize the safety of the whole team, resulting in injury or death.

Move only as fast as the team's slowest member. Stop periodically for a rest, a drink of water, and perhaps a snack. Stay in voice contact with your teammates. After negotiating a tricky obstacle, remain there until the next team member arrives, and offer help. Do not be reluctant to offer, ask for, or accept help.

Teams larger than six tend to be slow and difficult to manage, so divide a larger group of cavers into separate teams. In the event of an accident, one person on a team of four can stay with the injured person, and two can go for help. That way no one is caving alone.

Waste removal

Most caving trips are short enough that you can avoid relieving yourself underground. However, when you must relieve yourself, do so in an appropriate container or containers, and remove the waste from the cave. Not doing so forces the next caver to encounter it; even more importantly, your waste can affect the delicate ecosystems that exist in the cave.

Fire and smoke

Fire and smoke (including that from burning tobacco) fouls the air in caves, and it irritates the organisms that live there and other people who visit. Therefore, do not smoke or create fires in or near caves.

Underground trails

When established trails exist, stay on them to help keep other areas of the cave pristine. If you visit new or less-traveled passages, keep your team to one route to minimize your impact on the cave and establish a trail for future visitors.

Alertness

When caving, remain clear headed. Drugs, including alcohol, that affect your alertness, judgment, or ability to think clearly make you a dangerous caver and a threat to the safety of your team.

Fitness

Caving can be physically demanding. When you are in poor condition or poor health, you tire more quickly, you slow the team, and you endanger yourself. Fatigue or weakness makes you prone to accidents. Know your limits, and do not attempt trips beyond your abilities. Restrict new cavers to short trips. If you have doubts about the demands of a trip, consult an experienced caver who knows the cave. Tell your team members when you feel it is time to turn back. As it does in any physical activity, smoking diminishes your stamina and respiratory efficiency.

Ropes

You may find a hand line helpful on some climbs underground, but free-climbing a rope hand-over-hand is an easy way to die. Likewise, use only 100 % nylon hand lines that are rated for technical, vertical use. Vertical caving---using ropes to descend and ascend pits---involves special skills and special equipment. Vertical caving techniques and gear necessarily differ from those used by rock climbers. Seek vertical caving training from a competent instructor before doing rope work in a cave. Avoid using ropes, slings, and ladders you encounter underground.

 photo by Megan Porter

HAZARDS

A novice's apprehension before a caving trip is healthy, and an awareness of possible hazards helps you avoid them.

Rock!

Beware falling objects while caving. Avoid unstable breakdown and steep, loose slopes. Standing under anyone climbing puts you in a rockfall zone as well as in a "peoplefall" zone, a dangerous place to be. Do not start moving until those who might be hit by something you dislodge have moved to a safe place.

If you do dislodge a rock or drop equipment, warn those below you by shouting "**rock!**" loudly and clearly. When you hear someone yell "rock!" seek shelter, and do not look up!

Trapped

Avoid forcing yourself into small or tight places from which you may not easily return, or where your teammates are unable to reach you to help you to safety. Consider entering a tight passage feet first, especially going downhill, because it makes it easier to return if you do not continue. Know your limits, and back out if you are exceeding them.

Lost

As you proceed through a cave, examine the passage behind you, and memorize intersections and climbs. Responsible cavers know that every cave is two caves---the one you see entering and the one you see leaving. On the way in, place a small pile of rocks at certain intersections where the passage out may not be obvious.

There is little excuse for getting lost, but it happens. Systematically and thoroughly check passages, marking them with loose rocks as you eliminate possibilities.

If you are lost and your light supply is low, find a dry spot to wait for help. Help may not arrive for hours, so stay out of breezes, wear your driest clothes, and avoid being in the water. To help stay warm, you may need to wear the plastic garbage bag you carry in your helmet. Conserve lights by turning them off. Call out when you hear someone.

Falls

Falls are a common type of caving accident. Slow down, and pay attention to where you are going and what you are touching. Avoid running, jumping, and other sudden moves. An injury that might be minor or easy to treat on the surface can have life-threatening consequences and require a major rescue underground. Such a rescue can also endanger other people, as well as the cave itself.

When you climb, test handholds and footholds before committing yourself to a move. Wear boots that have good tread to help keep you from slipping on rocks and mud. Do not wear tennis or running shoes underground.

Floods

Some caves flood, either suddenly or slowly, and flooding can trap and even drown cavers. If in doubt, visit another cave.

Out of light

Moving together as a team, and each person carrying three sources of light, extra bulbs, and batteries, means that finding yourself out of light is only a dim possibility. However, if you do find yourself with no light, avoid trying to go anywhere. Because of the possibility of falls and unnecessary exposure, caving in the dark may lead to injury or death.

Hypothermia

Caves are frequently wet and sometimes breezy, and such conditions promote hypothermia, which can be deadly. Dress warmly, keep moving, stay out of breezes when not moving, and avoid getting wet.

photo by Bob Stucklen

QUICK REVIEW

For the cave

- Avoid disturbing cave organisms or their environment.
- Pack out everything you bring with you, and any trash you find.
- Carry an appropriate container or containers to remove your urine and feces from a cave.
- Do not smoke or light fires in caves or near their entrances.
- Do not disturb archeological or paleontological artifacts.
- Do not damage formations or other surfaces of the cave.
- Stay on established trails to help keep other areas of the cave pristine.
- Participate in projects to preserve and rehabilitate caves, such as removing graffiti, picking up litter, and repairing broken formations.
- Educate landowners about the value of their caves.
- Clean karst features, such as sinkholes, that have been used as receptacles for rubbish.

For yourself

- Learn safe caving skills from responsible cavers.
- Know your limits, rest frequently, and watch for fatigue in others.
- Be properly dressed and equipped.
- Check the weather forecast before entering a cave.
- Keep moving and dress warmly to avoid hypothermia.
- Let the slowest caver set the pace.
- If an immobilizing injury occurs, keep the injured caver warm, and seek help from a local cave rescue organization.
- If you get lost, conserve your light.
- If you have no light, avoid trying to go anywhere, and stay warm and dry.
- Practice rope work on the surface under the guidance of an expert before engaging in vertical caving.

You still want to go caving?

Then do yourself a favor. Contact a local chapter, or *grotto*, of the National Speleological Society (NSS). Its members are available to help you do it right and to teach you more about caves and caving.

In fact, join the NSS. With over 12,000 members, the Society does more than any other organization to study, explore, and conserve cave and karst resources, protect access to caves, and encourage responsible management of caves and their unique and fragile environments.

Cavers' motto

And follow the responsible cavers' motto:

Take nothing but pictures

Leave nothing but carefully placed footprints

Kill nothing but time

Finding out more

Finally, investigate. Here are the NSS cave conservation policy and some good books and web sites about caves and caving.

NSS Policy For Cave Conservation

Conservation creed

The National Speleological Society believes: that caves have unique scientific, recreational, and scenic values; that these values are endangered by both carelessness and intentional vandalism; that these values, once gone, cannot be recovered; and that the responsibility for protecting caves must be assumed by those who study and enjoy them.

Cave preservation

Accordingly, the Society works for the preservation of caves with a realistic policy supported by effective programs for: the encouragement of self-discipline among cavers; education and research concerning the cause and prevention of cave damage; and special projects, including cooperation with other groups similarly dedicated to the conservation of natural areas. Specifically: all contents of a cave, formations, life, and loose deposits, are significant for their enjoyment and interpretation. Therefore, caving parties leave a cave as they find it. They provide means for the removal of waste, limit markings to a few small and removable signs as are needed for surveys, and especially, exercise extreme care not to accidentally break or soil formations, disturb life forms, or unnecessarily increase the number of disfiguring paths through an area.

Collecting in caves

Scientific collection is professional, selective, and minimal. Collecting mineral or biological material for display purposes, including previously broken or dead specimens, is never justified, because it encourages others to collect and destroys the interest of the cave.

Appropriate conservation projects

The Society encourages projects such as: establishing cave preserves, placing entrance gates where appropriate, opposing the sale of speleothems, supporting effective protective measures, cleaning and restoring over-used caves, cooperating with private cave owners by supplying them with knowledge about their cave and assisting them in protecting their cave and property from damage during cave visits, and encouraging commercial cave owners to make use of their opportunity to aid the public in understanding caves and the importance of their conservation.

photo by Michael Carter

Publication of cave locations

Where there is reason to believe that publication of cave locations will lead to vandalism before adequate protection can be established, the Society will oppose such publication.

Society member duties

It is the duty of every Society member to take personal responsibility for spreading a consciousness of the cave conservation problem to each user of caves. Without this, the beauty and value of our caves will not long remain with us.

Additional Reading

Books

The following books and others are available from the National Speleological Society Bookstore, http://www.caves.org/service/bookstore/.

National Speleological Society
2813 Cave Avenue
Huntsville, AL 35810
256-852-1300
nss@caves.org

America's Neighborhood Bats,
1988, Merlin Tuttle
Caving Basics,
Third Edition, 1992, G. Thomas Rea, Editor
Adventure of Caving,
1996, David R. McClurg
On Rope II,
1996, Bruce Smith and Alan Padgett

Useful Web sites:

- National Speleological Society: **http://www.caves.org**
- National Caves Association: **http://www.cavern.com**
- Bat Conservation International: **http://www.batcon.org**
- National Park Service Caves and Karst Program: **http://www.2.nature.nps.gov/grd/geology/caves/index.htm**
- Virtual Cave: **http://www.goodearthgraphics.com/virtcave.html**

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