

TRAINING MANUAL FOR MICHIGAN 4-H

OUTDOOR ADVENTURE CHALLENGE



Section: CAVING



CAVING SECTION CONTENTS

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July 11, 2008

TO: 4-H Outdoor Adventure Challenge Leader Trainees and Instructors

FROM: Paul Koehler, Caving Instructor;
Jim Harper, State 4-H Outdoor Adventure Challenge Coordinator and County Extension Director, Kalkaska County

RE: Caving Training – August 22 to 24, 2008
Spring Mill Campground Youth Area ‘B’, Mitchell, Indiana
Mill Cave, Henderson Park in Salem Indiana

We will be doing our caving training in Henderson Park in Salem, Indiana again this year. Paul will be leading us for this weekend with assistance from other OAC leaders. We will be camping at Spring Mill State Park, Mitchell, Indiana.

Be sure and bring **Leader Certification Record and Health Form card**
 Personal Data Sheet

For directions for any Outdoor Adventure Challenge training, we recommend you use Mapquest. You can Google Mapquest on your computer and get a detailed map of the area of the training and/or directions to and from the training. Mapquest web address is: <http://www.mapquest.com>. If you prefer a hand-written map and directions, request them from Jim Harper and he will be happy to send you a hard copy. He can be reached at the Kalkaska County MSU Extension Office, 231-258-3320 or by email at harper12@msu.edu. We encourage people to call around to put travel groups together because it's a 6-8 hour drive from lower Michigan.

Please call Paul by August 8 (248-684-9376 or 586-506-6374) to confirm your participation in this weekend training and to talk about any needs or concerns that you may have. If you need to also reach Jim, his number is 231-258-3320. We look forward to having you join us!

We need to be ready to leave for the cave by 9 a.m. on Saturday, so plan on being in the campgrounds sometime Friday night or early Saturday. (Let one of us know before hand if you will be arriving Saturday morning.) **Please note the campground entrance closes at midnight Indiana time, if you arrive after that you won't be able to get in until morning.** To give you a reference for travel time to get there – it's a 7-hour drive from Milford, non-stop.

Emergency Contact Information:

Spring Mill State Park: 812-849-4129 (We will be camped in Youth Area ‘B’)

Salem Police Department: 812-883-5100 (Salem owns Henderson park)

Jim Harper: (231) 258-3320 Office, (231) 350 -0501 cell phone

GENERAL INFORMATION AND EQUIPMENT LIST

CAVING WEEKEND

Everyone is responsible for their own equipment, except helmets. We will have a helmet for you to use. Please let us know if you will be using our helmets or if you have your own. The key to a successful caving experience is being prepared. We will encounter water as we enter the cave, and cave temperatures are about 54 F. Plan to wear a pair of synthetic long underwear; wool socks **NON-waterproof** boots and a pair of coveralls on top. (These can be found at garage sales and Salvation Army stores cheap.) A denim jacket or some other type would do instead of the coveralls. Another option is cheap wool pants from Salvation Army Stores. The key is to have a fairly durable outer layer (COVERALLS). The rocks tend to pull at your clothing. Just remember that what ever you wear will get muddy. We often visit a car wash to get rid of the mud on our clothes after caving all day. You should bring several plastic bags to carry your wet stuff home in. Cave mud isn't good for a home washing machine, so hose off the mud before you wash the clothes wherever you plan to clean up.

When you enter the cave you will need a helmet with a light source on your head, appropriate clothing and a cave pack. Your primary light for your helmet should be bright, water proof and should have battery power to last all day. There are many new LED lights that work well. If you don't have an LED headlamp, we can duct tape a flashlight to your helmet.

Lights are very important! You need three sources. They **NEED to be a waterproof headlamp or flashlight, with two D size batteries** that can be taped to a helmet (not a cheap plastic one); **a small flashlight**, worn on a lanyard around your neck; and **an extra light in your backpack**, like candles and matches (in a waterproof container) or an extra flashlight. **Bring** extra batteries and bulbs for your flashlights along in your backpack as well. You must have these three (3) sources of light.

Other Items You Should Bring

You can use an old book bag or other small pack, but they need to be fairly substantial since they will get dragged over rocks and through mud. Try to bring old items that you won't mind getting dirty, worn or ruined.

A fleece jacket or wool sweater that can get wet and muddy, or a coverall with long sleeves is necessary. The coverall won't ride up or get caught as easily. Long pants - **not jeans**. The pants should be part wool, polyester, or some other synthetic that you won't mind getting wet and muddy. The Salvation Army, St. Vincent's, or other thrift store is a good place to find this kind of trousers for next to nothing. Cotton wicks moisture up your entire body and you will soon be soaked and cold. Avoid cotton clothing.

Footwear that has treads and is **not waterproof** is best. **DO NOT** wear rubber boots or waterproof boots because they will fill with water and your feet will get cold. **DO wear winter weight wool socks and sock liners**.

Wool gloves or a mixture of wool and polyester are to be worn in the caves. A bandanna large enough to wrap around your head under your helmet to keep the helmet from rubbing in the wrong places is also a good idea.

Bring several large plastic garbage bags to sit on in the cave and store your wet clothing until you can wash them. Knee and elbow pads are not essential, but will make the crawling we do much more comfortable. The athletic type work very well. Hard plastic pads such as for rollerblading are not recommended and should not be brought.

Bring at least one quart of water. This sounds like a lot, but you will be in the cave for several hours and will need it. Bring high energy foods like gorp or a sandwich to eat in the cave. Take them in something waterproof and which will prevent them being smashed. Caving takes a lot of energy and you want to be sure you have enough food and water. Pack extra ziplocks for refuse because whatever we take into the cave we will take out.

You can carry an extra fleece in a ziplock in your pack in case you get cold. You might get it muddy putting it on but it is worth the extra insurance.

Caving is a very enjoyable activity. We will have several knowledgeable guides. You'll appreciate the environment and the challenge in the caves.

Be sure to carefully read the information on gear and equipment needed in your handbook.

Campgrounds

You will need camping gear for the weekend, cooking gear, food for your meals (Friday night, Saturday x3, Sunday morning), and anything else you may want to stay comfortable. (**New trainees may want to give a call to discuss gear needs in more specifics.**) We will be camping next to our cars, so you can pack a little heavier than for the backpacking trip. If you have any questions, please don't hesitate to call or Paul at 248 684-9376 or 586-506-6374 or e-mail *EFIPTK@aol.com*

Directions to Spring Mill State Park, Mitchell, Indiana

Take I-69 through Fort Wayne, Indiana to Indianapolis. Take I-465 South around Indianapolis to Route 37. Take 37 South through Bloomington to Mitchell. Take Route 60 East to Spring Mill. Follow the signs to the campground, then follow the signs to Rally Camping or Youth Tent Camping. (They are the same, but different parks call them different things). You'll know that you are in the right place when the road ends, there are pit toilets on one side and you have to walk up the hill to pitch your tent. Paul has reservations for us under Mi State Outdoor Adventure (Youth Area B), but you need to be there before midnight. If you get hungry on the way down, and you have time, try Noble Roman's in Bloomington for pizza.

GEAR LIST FOR OUTDOOR ADVENTURE CHALLENGE SPECIALTY TRAINING—CAVING

We will be camping in an area with no facilities, so you will need all of your basic camping gear, plus food and water.

Clothing: Be prepared for any types of weather. You should have at least two changes of clothing and four extra pairs of socks. Don't forget rain gear.

For caving, you will need the following:

- A pair of coveralls, or loose clothing that you don't mind destroying. (Clay stains may not wash out).
- A hard hat and a pair of gloves (hat with strap - call if you need a hat)
- A pair of non-skid soled boots
- A pair of knee pads (we supply)
- A side pouch. This should be heavy duty (gas mask bags from Army surplus stores work great) and large enough to carry the following items:
 - Knife, whistle and water-proof matches
 - First Aid kit
 - Drinking water
 - High energy snacks
- Three light sources. They could be:
 - 1 carbide lamp*, 1 flashlight*, and 2 candles
 - 1 electric head lamp, 1 flashlight*, and 1 candle
 - 2 flashlights* and 1 candle

They **CANNOT** be: 1 flashlight and 2 candles

*If you are using a carbide lamp, you should carry extra carbide, water, and a repair kit. If you are using flashlights, you should carry extra batteries and an extra bulb for each light.

CAVING – Potential Hazards and Cave Safety

Lost:

Learn return route by turning around often while traveling inward to see what the return route will look like. Pay attention to distinctive formations and passage configurations. Using a compass and a note pad to jot down route info is helpful

If you become lost sit down and think. *Stay Calm!* Turn your primary light down or use a candle, so as not to waste your light. If there is no danger of hypothermia, remain where you are and let the rest of your caving party find you. * **NEVER CAVE ALONE** *

In frequently visited caves, the main route is often easy to recognize because the rock is mud-colored and at times worn smooth from cave traffic. Formations may be discolored about shoulder level, having been used as hand holds. In the past, cavers would smoke or paint arrows on the walls to mark their route. This is **NO LONGER ACCEPTABLE**. The rule was that these arrows should always point toward the nearest entrance. Never trust these implicitly; An uninformed caver may have pointed them in the wrong direction.

Contaminated Air:

Less than 1% of known caves possess bad air.

Carbon dioxide is heavier than oxygen, therefore, a caver who is located in a depression with poor air circulation could conceivably reduce the supply of oxygen. This situation is rare, as most caves possess good circulation (unlike many abandoned mines).

Many cavers think that candles or carbide lamps will be extinguished before the oxygen level will be at a seriously low level for the caver; this is **NOT** true.

Hydrogen sulfide, which smells like rotten eggs, is extremely dangerous. When mixed with moisture such as the eyes, nose, or throat sulfuric acid is formed. If you detect the smell of sulfur, the **cave is off limits**.

Forest litter or other plant materials, washed into the cave and lodged there, sometimes produces methane gas in the process of decomposition. Methane gets trapped in stream bottom mud and bubbles up to the surface of the water. This gas is flammable and will burst into flame if exposed to carbide lamps or other flames.

Fires:

Do not build fires in caves. Even a small amount of carbon monoxide is lethal to human beings. Use small backpack stoves for cooking or heating liquids.

Guano has been known to ignite and even explode. **Never** light any flame near an area with bat guano.

Acetylene:

Carbide cavers must carry their carbide in waterproof containers. Occasionally one hears of a careless caver who is in the process of wading through or climbing in water, manages to soak his improperly packed carbide, thereby producing large amounts of acetylene gas. The acetylene catches fire and blows up spontaneously; this can be dangerous. Transport carbide properly.

Floods:

Do not enter caves if a storm is threatening, if rain is forecasted, if it has rained recently, or if there is melting of snow pack in the area. Piles of flood debris at a cave entrance are an obvious warning that the

cave is subject to flooding. Inside caves, leaves and debris trapped high up in passages are a good indication that that portion has been flooded.

Snakes:

In a cave entry, snakes may be located on ledges and in niches in the walls as well as on the floor. Look where you put your hands and refrain from peering at ledges at close range in a way that may put you eyeball to eyeball with a resting reptile.

Cave Conservation

The idea of cave conservation is simply that caves remain open in their original beautiful condition for generations to come. When first discovered, a “virgin” cave is a joy to behold. Multi-colored dripstone and flowstone formations gleam wetly, reflecting the first explorer’s lights in pure color. The walls are clean, showing their rock structures clearly, and mudbanks are kept smooth and even by natural erosion. Amazingly, fragile rock structures stand untouched as they have since their creation. The passages teem with life – interesting creatures helping each other to the little nourishment which comes in from the surface.

But when man comes, he upsets the natural balance. His garbage introduces new and unwelcome life forms, while poisoning the more delicate cave-adapted life. These animals are in such an ecologically precarious balance that disturbing just one crayfish, salamander or beetle, could spell disaster to an entire cave full of interesting creatures. Cave animals should be left as they are so others can appreciate them later.

Cave animals that are frightened away from heavily visited passages may return when all is quiet and plenty of water may eventually wash the streams clean. But the rock formations that are the major features of most caves can never regrow within our lifetimes. Once they are broken, they can never be replaced. When removed from the wet cave, formations soon lose their beauty and crumble to dust. Merely touching the formations ruins their colors. Collecting even small broken fragments can be a bad example, as it might encourage others to break off and take home large, in-place formations. It can readily be seen that if every person who entered a cave removed just one of the formations, the cave would be stripped bare of its beauty in a short time.

Authentic signatures on walls with dates before 1900 have historic significance, but any other marks on cave walls (other than survey marks) are types of vandalism punishable by a 1947 law, with a fine of up to \$500 and up to 6 months imprisonment. Many vandals have been caught by conservationists when their names were recognized from cave walls. Instead of being imprisoned or fined, the offenders are usually sent out to remove all traces of writing from the caves they have visited. When maps and guidebooks are available, even directional arrows on walls are not necessary, and merely add to the pollution.

Most heavily visited caves give the beginner a graphic illustration of the evils of vandalism. It could be prevented if every visitor heeded these simple rules:

- Take nothing but pictures
- Leave nothing but footprints
- Kill nothing but time
- Use a single trail so that soil geologists may study the untouched passage floor

Occasionally, conservation-minded groups should clean all trash and wall disfigurements from caves as a public service. The good effects of this seldom last long, unless all future visitors are conservation-minded as well.

But, even when properly conserved, a cave may be closed to exploration if the owner's wishes are not heeded. All of his property must be treated with respect. Where necessary, groups should check in with him to tell him when they plan to leave. Following the entrance requirements listed in this publication will help keep these and other caves open in the future.

Coming Back Alive

Even the veteran cave explorer will find each trip a new experience. You never stop to look at the same things or use the same hold or take exactly the same path through a wild cave. Your first trip through a non-commercial cave will be a unique experience. It need not be dangerous if you observe safety rules derived from common sense and the past experience of others.

First of all, you must supply your own light, just as an astronaut carries air to breathe in space. If you run out of light and have to be rescued, you will probably be charged for the time and trouble taken to locate you. Remember that no light source is foolproof. Calcium carbide for miner's lamps can become explosive if not packed in an air-tight container, one that will not come open in a pack. All electric headlamps and flashlights have a tendency to stop working when needed the most, if they are not carefully dried after each trip. Even wax-tipped matches stop working when wet. The proven fail-safe numbers are three dependable lights per person for small groups, two apiece for groups of six or more. I take four lights.

Proper clothing is also important. A hard hat, such as a rock-climber's or construction worker's helmet is necessary. (You will find out why when you first try to stand up in a two foot high passage.) The helmet should have a lamp-holding bracket on the front. You will also need shoes that grip in mid. Tennis shoes are good, but army surplus boots with tread, such as jungle boots, are better. In between, wear clothes that you aren't afraid to tear up and get muddy. You might find blue jeans, sweatshirts, kneepads and strong but flexible gloves useful. Dress for 56 degrees temperature, 100% humidity, and heavy exertion.

Instead of trying to "blaze a trail" or unroll string, find an experienced guide or learn to decipher the structure of the cave. It is difficult to become lost in most caves if you keep your head and confer with the other members of your party. Plan your trip in advance so that you do not extend yourself beyond your capabilities.

When you have your schedule planned, place it with someone who is close to a telephone and can call for aid if you don't come back in a reasonable amount of time. If there is a change of plans as to cave area or time due back, the person with whom the original schedule was left should be notified.

While you are planning your trip, check the weather. Beware of possible rainy conditions. Many Indiana caves flood in spring and autumn rains, and occasionally trap explorers for as long as a week. If it is raining, restrict yourself to the known "dry" caves, and beware of any abnormal water even there. *All* caves were formed at least partly by being filled with water.

Many climbing and crawling techniques can be learned in the cave, but vertical climbing techniques should be learned and practiced on the surface first. There are proper techniques for negotiating pits and unclimbable walls, and "hand-over-hand" rope climbing is *not* a safe method. Instruction in safe, proven techniques can be obtained from experienced cavers and mountain climbers.

Finally and most important, take somebody with you. Caving with at least one, but preferably three, other people makes the trip safer and more interesting and instills more confidence in the ability of each

explorer. If one of a party of four is hurt, one can stay with the injured, and two can go out to bring back help.

In case of an accident where a rescue is necessary, the State Police should be contacted. They have the facilities to quickly contact the necessary personnel. Be sure to report the cave and area the accident has occurred in and the extent of injuries. Before you call, be sure it is because a rescue is really necessary.