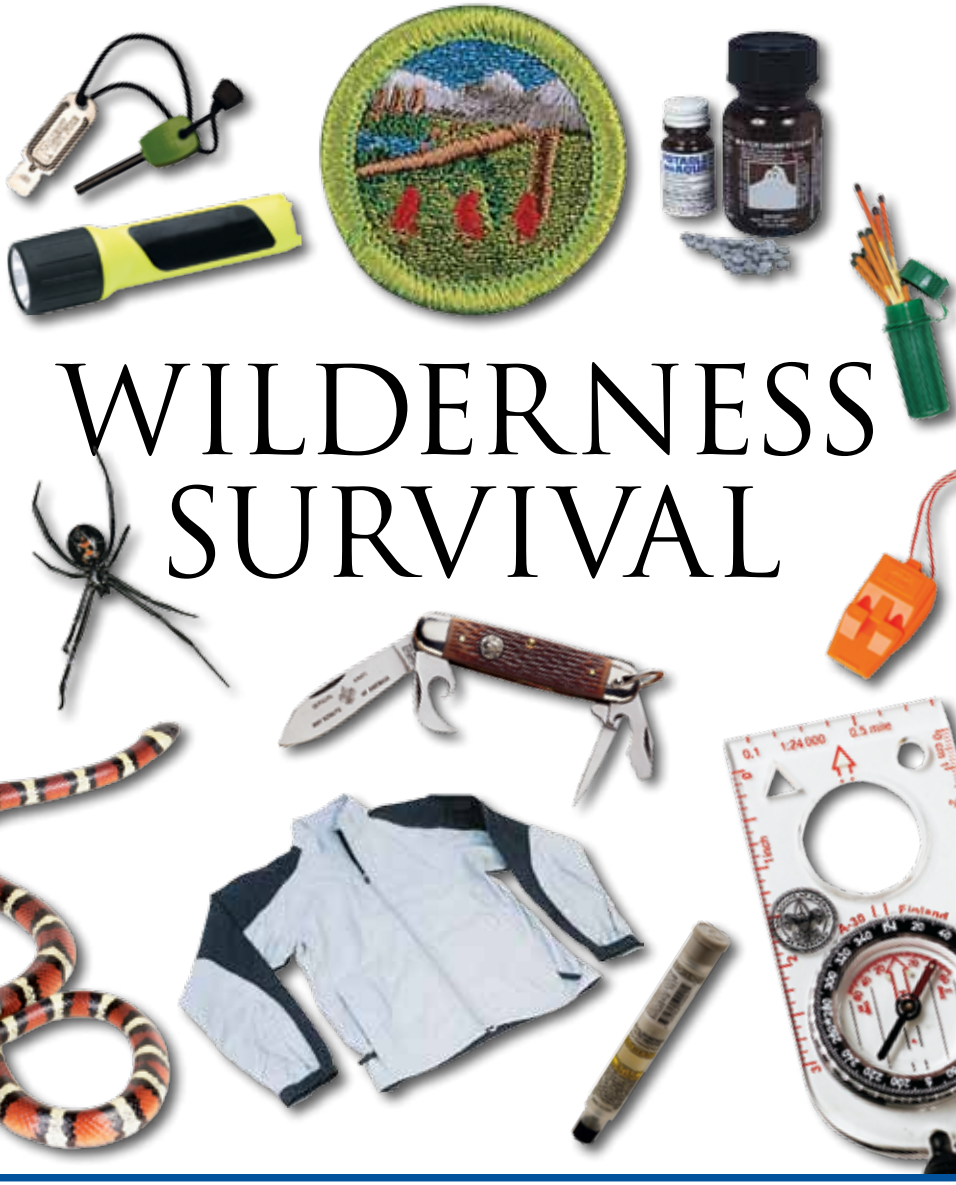
MERIT BADGE SERIES



WILDERNESS SURVIVAL

How to Use This Pamphlet

The secret to successfully earning a merit badge is for you to use both the pamphlet and the suggestions of your counselor.

Your counselor can be as important to you as a coach is to an athlete. Use all of the resources your counselor can make available to you. This may be the best chance you will have to learn about this particular subject. Make it count.

If you or your counselor feels that any information in this pamphlet is incorrect, please let us know. Please state your source of information.

Merit badge pamphlets are reprinted annually and requirements updated regularly. Your suggestions for improvement are welcome.

Send comments along with a brief statement about yourself to Youth Development, S209 • Boy Scouts of America • 1325 West Walnut Hill Lane • P.O. Box 152079 • Irving, TX 75015-2079.

Who Pays for This Pamphlet?

This merit badge pamphlet is one in a series of more than 100 covering all kinds of hobby and career subjects. It is made available for you to buy as a service of the national and local councils, Boy Scouts of America. The costs of the development, writing, and editing of the merit badge pamphlets are paid for by the Boy Scouts of America in order to bring you the best book at a reasonable price.



BOY SCOUTS OF AMERICA
MERIT BADGE SERIES

WILDERNESS SURVIVAL



BOY SCOUTS OF AMERICA.

Requirements

1. Show that you know first aid for and how to prevent injuries or illnesses that could occur in backcountry settings, including hypothermia, heat reactions, frostbite, dehydration, blisters, insect stings, tick bites, and snakebites.
2. From memory, list the seven priorities for survival in a backcountry or wilderness location. Explain the importance of each one with your counselor.
3. Discuss ways to avoid panic and maintain a high level of morale when lost, and explain why this is important.



4. Describe the steps you would take to survive in the following conditions:
   a. Cold and snowy
   b. Wet (forest)
   c. Hot and dry (desert)
   d. Windy (mountains or plains)
   e. Water (ocean, lake, or river)

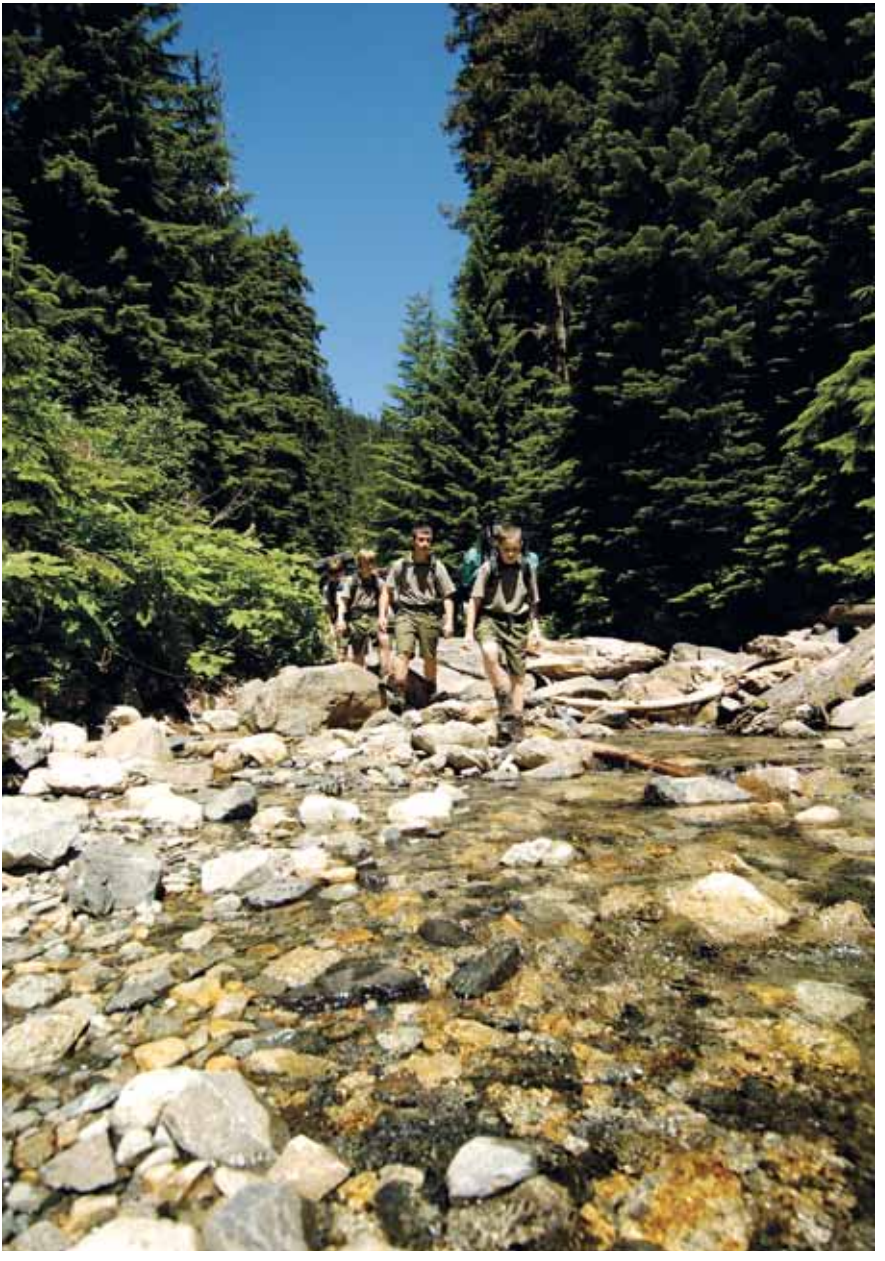
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BANG/Brainerd, MN
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5. Put together a personal survival kit and explain how each item in it could be useful.
6. Using three different methods (other than matches), build and light three fires.
7. Do the following:
   a. Show five different ways to attract attention when lost.
   b. Demonstrate how to use a signal mirror.
   c. Describe from memory five ground-to-air signals and tell what they mean.
8. Improvise a natural shelter. For the purpose of this demonstration, use techniques that have little negative impact on the environment. Spend a night in your shelter.
9. Explain how to protect yourself from insects, reptiles, and bears.
10. Demonstrate three ways to treat water found in the outdoors to prepare it for drinking.
11. Show that you know the proper clothing to wear in your area on an overnight in extremely hot weather and in extremely cold weather.
12. Explain why it usually is not wise to eat edible wild plants or wildlife in a wilderness survival situation.







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Introduction

Wilderness survival—taking care of ourselves in ways that allow us to come home safely—is what we do whenever we are in the outdoors. Most of the time we get along just fine when we are camping, backpacking, canoeing, and taking part in other outdoor activities. We have brought along the clothing and gear we need. We've made good plans, and we do our best to manage any risks.

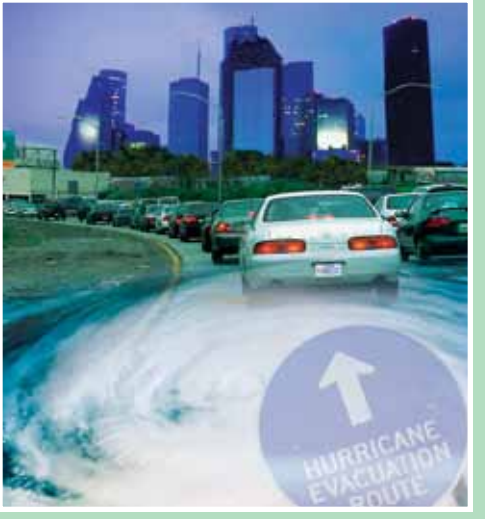
But now and then something unexpected happens. We wander off a trail and lose our way. Someone becomes injured. A storm catches us by surprise. A boat capsizes. A snowmobile runs out of gas far from a road. We no longer know where we are, or we find ourselves without the equipment, water, and food that we usually take on our adventures.

When things go wrong, the skills of wilderness survival can help make everything right again. Thinking through the challenges that face us and coming up with good solutions are vital to taking care of ourselves in the outdoors, especially when we must get out of difficulties. Wilderness survival means knowing how to stay alive and well until the emergency is over. It means working with nature rather than against it. It means always having a positive attitude—the one essential that can't be carried in a pack or a pocket.



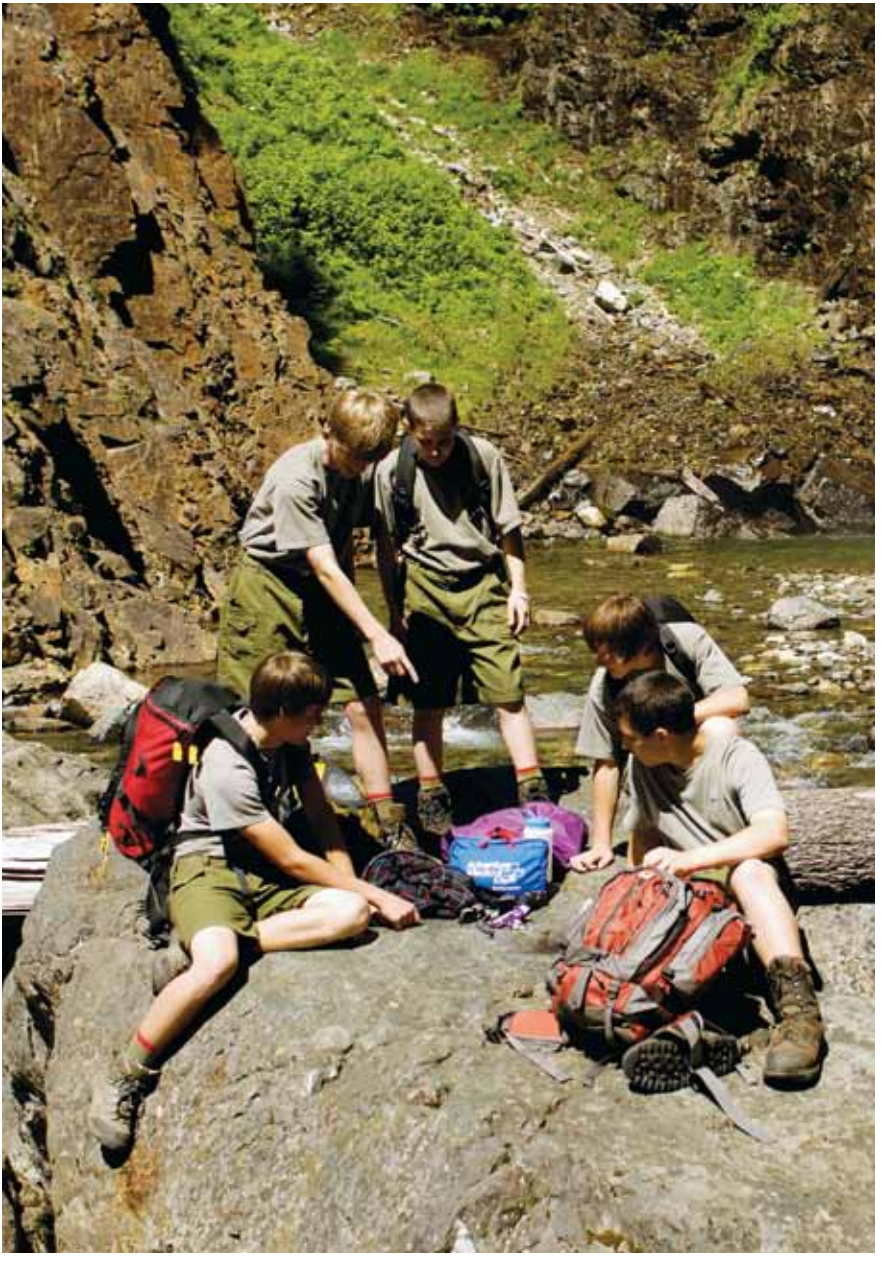
Mastering wilderness survival takes practice. During trips to the outdoors that are not emergencies, you can learn to light a fire without matches, build a shelter without a tent, signal for help, and practice first aid. Earning the Wilderness Survival merit badge will get you started in the right direction, but there is always more to learn.

Natural Disasters



As recent events in the United States have shown, the skills of wilderness survival can be every bit as important during natural disasters as they are during backcountry outings. Hurricanes, tornadoes, wind storms, blizzards, heat waves, and power outages can put people in situations where the usual networks of support are not available. People might be on their own for a few hours, a few days, or even longer periods of time.

The preparations you can take to respond to emergencies, whether in a city, a rural area, or deep in a wilderness, are the same. Whenever an emergency occurs, use your head to size up the situation and seek out solutions.



Preventing Emergencies

The best emergency is the one that never happens. Prevention is the result of preparing well, making good plans, and having the proper equipment. As you begin thinking about what you will do in case of an emergency, it can be helpful to know some of the primary causes of survival situations.

- Not planning ahead, or failing to prepare a trip plan
- Not having good leadership in your group
- Being in poor physical condition, wearing the wrong clothing or footwear, or lacking the motivation or skills for the activity
- Not eating enough, or eating the wrong diet
- Becoming too tired, too cold or too hot, or thirsty
- Not recognizing and dealing with a potential problem
- Encountering unexpected changes in the weather or unexpected terrain

Commonsense ways to increase your safety and your enjoyment of outdoor adventures are covered in the seven points of the BSA's Trek Safely plan:

1. **Qualified Supervision.** Whenever planning a trek, make sure your group includes a mature, conscientious adult at least 21 years old who understands the potential risks involved in the trip and can take responsibility for the group's safety. One additional adult who is at least 18 years old must also accompany the group.
2. **Keep Fit.** You can train for a trip in the outdoors just like any other athletic event. Start slowly, gradually increasing the duration and intensity of your workouts, to build your physical fitness and stamina. Staying in good shape helps keep you ready for the physical demands of a trek.



Additional details on Trek Safely are available on the BSA's Web site: *http://www.scouting.org.*

3. **Plan Ahead.** Any trip you plan should match the skill level and fitness of the members of your group. Remember to get permission from the land owner if you plan to cross or use private land, and research the terrain, elevation ranges, trails, wildlife, campsites, typical weather conditions, and environmental issues for the period of the trek. Know where you're going and what to expect.
4. **Gear Up.** Before you leave, get topographic maps and current trail maps for the area. Take equipment—including a first-aid kit—and clothing that is appropriate for the weather and is in good condition. Wear proper protection against the sun and biting insects and animals, and remember to adjust clothing layers to match the weather conditions. Drink plenty of water to stay hydrated.
5. **Communicate Clearly and Completely.** Communication is key to a safe outdoor adventure, and staying in touch with home base is the first step. Complete a trip plan and share the details of your trek with someone back home.
6. **Monitor Conditions.** The leaders are responsible for making good decisions during the trip, based on their knowledge of the group's abilities. Keep an eye on weather conditions before and during the trip, and continually monitor your food and water, the group's morale, and their physical condition. Don't enter into a dangerous situation.
7. **Discipline.** Make sure everyone in your group understands the rules and procedures for safe trekking. When participants know the reasons behind the rules, they are much more likely to follow them.

We seldom go to the backcountry with the intention of getting ourselves into survival situations. In fact, our basic instinct is to do the opposite—to prepare well and stay as safe as possible.



Trip Plan

A trip plan answers five questions, each beginning with the letter *W:*

Where are we going and by which route?
When will we return?
Who is going along?
Why are we going?
What are we taking with us?

A copy of your trip plan should be left back home with one or more persons who are responsible, reliable, and available. If you don't return as scheduled, those back home can alert search-and-rescue personnel and give them a good idea where to start looking for you.


Trip Plan

Trip plan of

Where
Destination
Route going
Route returning

When
Date and time of departure
Date and time of return

Who
Names of participants

Why
Purpose of the trip

What
☑ Gear and other items to be taken:
Outdoor Essentials
Other clothing and gear

Permits required
Special equipment needs
Special clothing needs

How
List the principles of Leave No Trace that relate to your trip. For each one, write a sentence explaining what the patrol will do to follow that principle.

Check the BSA's *Guide to Safe Scouting* for more guidelines on trip planning. You can find the *Guide* online at *http://www.scouting.org/scoutsource/HealthandSafety/GSS.aspx.*



Emergency Survival Kits

The very fact that you are putting together a survival kit to carry into the backcountry will improve your chances by providing you with a few items that will make your life easier. Perhaps even more important is that you are thinking about dealing with possible emergencies long before they can develop.

Every survival kit begins with the Outdoor Essentials. Get into the habit of having them with you on every trip into the backcountry.

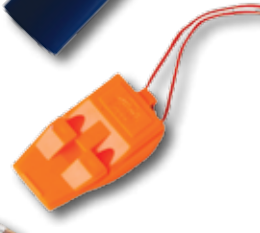


- ❑ Pocketknife
- ❑ First-aid kit
- ❑ Extra clothing
- ❑ Rain gear
- ❑ Water bottle
- ❑ Flashlight
- ❑ Trail food
- ❑ Matches and fire starters
- ❑ Sun protection
- ❑ Map and compass











Adding some or all of the following items to your emergency kit can come in handy during survival situations.

Duct Tape. Wrap a length of it around a plastic water bottle and you will always have some handy.

Whistle. A whistle can be heard for longer distances than shouting can and requires less energy.

Signal Mirror. A metal signal mirror can be slipped into your first-aid kit or a side pocket of your pack. Keep it in its case or slip it inside a spare sock to protect it from becoming scratched and dull.

Thin Wire. A few feet of thin wire can come in handy for repairing camping gear.

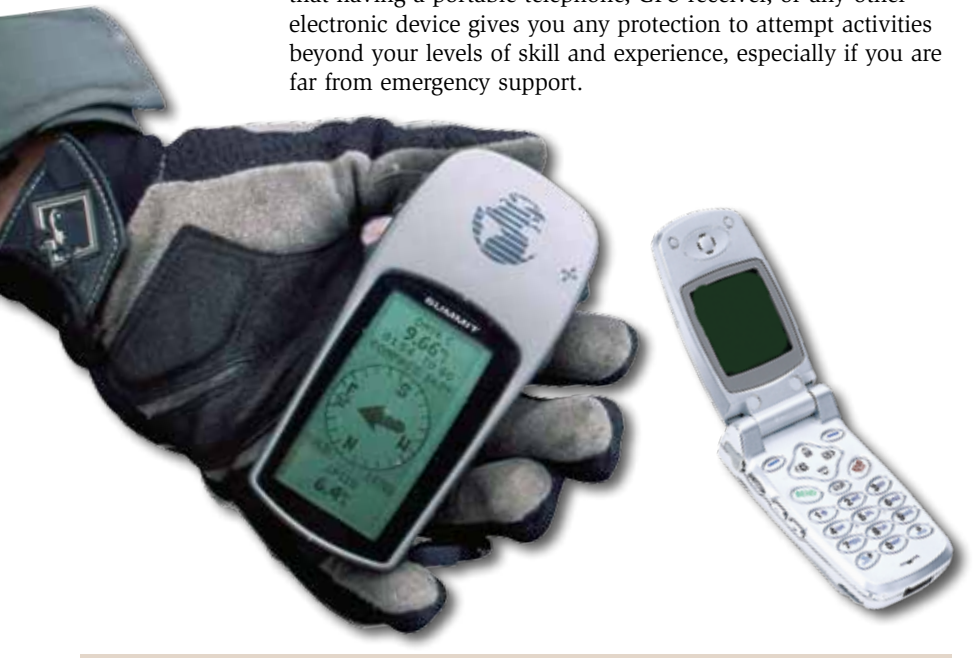
Garbage Bag. A heavy-duty 30- to 39-gallon plastic bag, preferably in a bright color, can be used for emergency rain gear, to protect tinder and kindling from the rain, and to shield your sleeping bag and other equipment.

Fishing Line and Hooks. Fifty feet of nylon fishing line can have many uses for making repairs. Add a few hooks and you will have the gear you need to try fishing in lakes and streams.

Mobile Phones and Global Positioning Receivers

Global positioning system (GPS) receivers allow travelers to pinpoint locations, but they are no substitute for mastering the use of maps and compasses. Likewise, mobile telephones can be a convenient means for groups to contact emergency response personnel, but phones are useless if they malfunction, the batteries are exhausted, or distance and terrain prevent clear reception of signals.

Unnecessary use of mobile phones can take away some of the joy of backcountry solitude, independence, and challenge. If you carry a portable telephone, stow it deep in your pack and bring it out only for emergency calls. Most of all, never assume that having a portable telephone, GPS receiver, or any other electronic device gives you any protection to attempt activities beyond your levels of skill and experience, especially if you are far from emergency support.



Survival Without Kits

Sometimes an emergency occurs when you don't have a survival kit with you. You will still have a good head on your shoulders and the ability to use it. Make the best of a situation by using the resources around you, by drawing on your skills and knowledge, and by having a positive attitude.

Clothing as Survival Gear

Clothing is your first line of defense against the elements. It keeps you warm in the winter, cool in the summer, dry in storms, and sheltered from insects, sun, and wind. To help decide what you need, learn about the materials from which clothing is made.



Wool. For generations of backcountry travelers, wool was the fabric of choice. Of course, that's about all there was for making warm clothing. Wool is still terrific for many cold-weather adventures. It is durable and water-resistant, and can help you keep warm even when the fabric is wet. A wool shirt or sweater can ward off the chill of summer evenings, too. Wool is also an excellent choice in hiking socks, hats, and mittens. (If wool irritates your skin, you may be able to wear wool blends or wear woolen layers over clothing made of other fabrics.)



Cotton. Cotton clothing is cool and comfortable. That makes it very good for hot-weather shirts and shorts, especially in dry climates. If cotton becomes wet, though, it loses its ability to insulate, and it may be slow to dry. That can be a real danger on cool days, especially when mist, rain, and wind bring with them the threat of hypothermia.

Synthetics. Outdoor clothing made of nylon, polypropylene, and other manufactured fabrics can be sturdy and comfortable and can maintain warmth even when wet. Look for synthetics in underwear, shirts, sweaters, jackets, pants, mittens, and hats. Lightweight nylon shorts and shirts are ideal for hot weather, drying quickly when wet. Waterproof and breathable synthetic fabrics are used in parkas and rain gear and as the shells of mittens and gloves.

Choose layers of clothing that, when combined, will meet the most extreme weather you expect to encounter. On a chilly autumn day, for

You can also use the layering system to keep cool in hot climates by stripping down to hiking shorts, a T-shirt, and a brimmed hat. Lightweight long pants and a long-sleeved shirt will shield you from insects, brush, and the sun.

example, you might set out from the trailhead wearing long pants, a wool shirt, a fleece sweater, mittens, and a stocking hat. As you hike, the effort will cause your body to generate heat. Peel off the sweater and stuff it in your pack. If you are still too warm, loosen a few buttons on your shirt or slip off your mittens and hat.

When you are no longer exerting yourself, stay warm by reversing the procedure, pulling on enough layers of clothing to stay comfortable. After the sun goes down, you may want to add an insulated parka and fleece pants or long underwear.

Basic Warm-Weather Clothing Checklist

- ❑ T-shirt or lightweight short-sleeved shirt
- ❑ Hiking shorts
- ❑ Underwear
- ❑ Socks
- ❑ Long-sleeved shirt (lightweight)
- ❑ Long pants (lightweight)
- ❑ Sweater or warm jacket
- ❑ Brimmed hat
- ❑ Bandannas
- ❑ Rain gear
- ❑ Appropriate hiking footwear

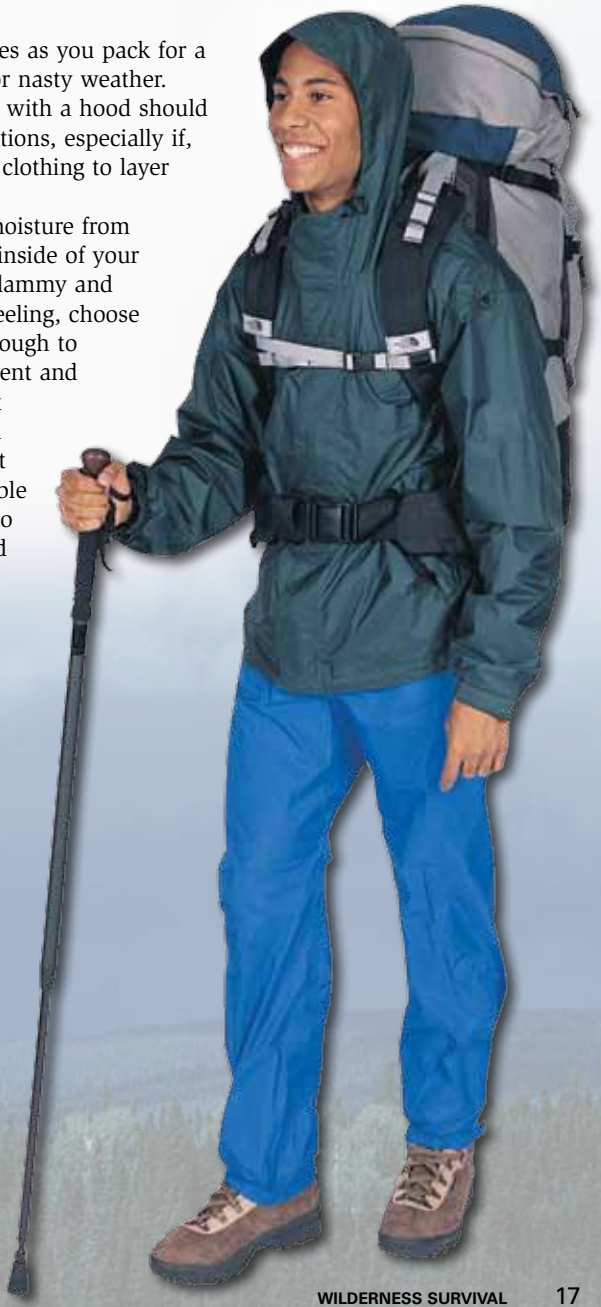
Basic Cold-Weather Clothing Checklist

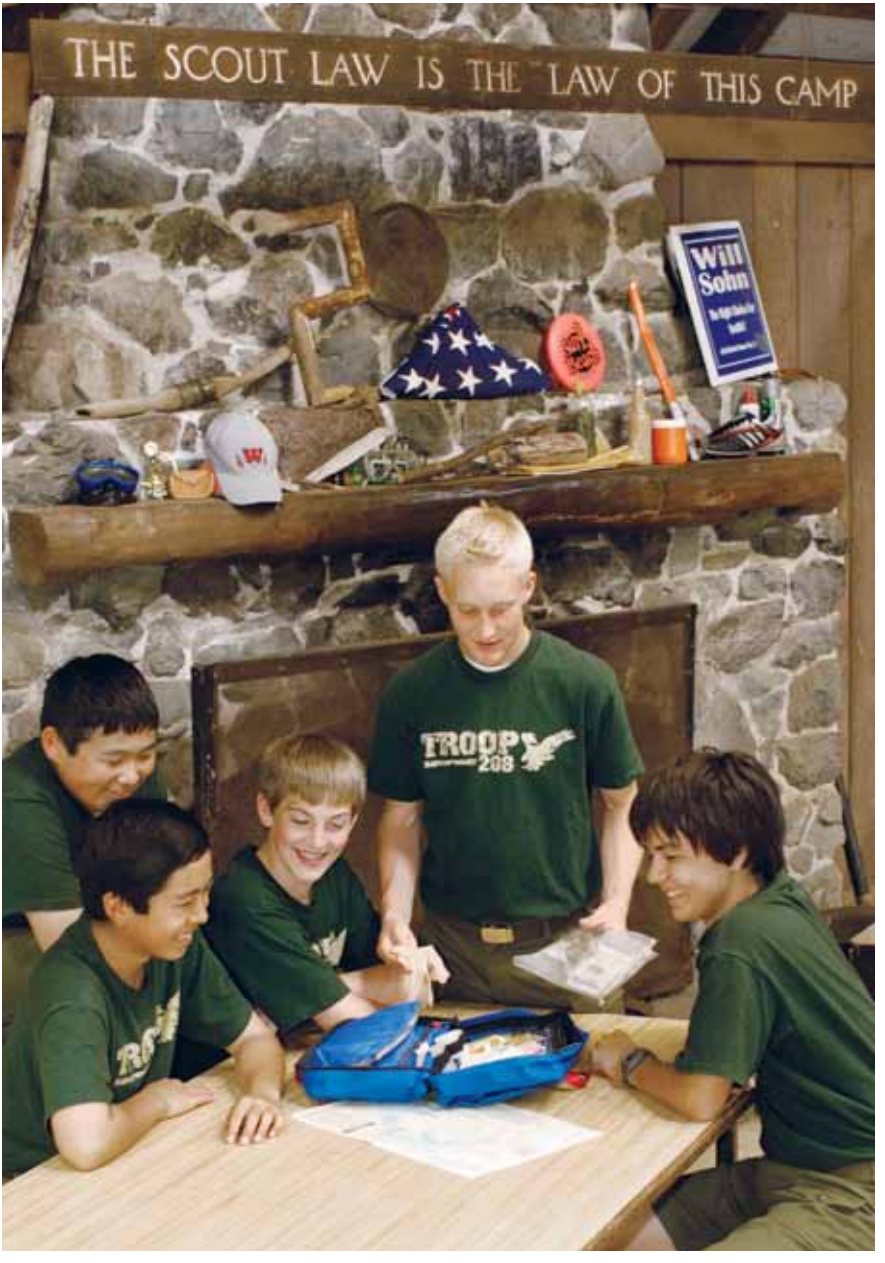
- ❑ Long-sleeved shirt
- ❑ Long pants (fleece, wool, or synthetic blend)
- ❑ Sweater (fleece or wool)
- ❑ Long underwear (polypropylene)
- ❑ Socks (wool or synthetic blend)
- ❑ Warm hooded parka or jacket
- ❑ Stocking hat (fleece or wool)
- ❑ Mittens or gloves (fleece or wool) with water-resistant shells
- ❑ Wool scarf
- ❑ Rain gear
- ❑ Appropriate cold/wet weather footwear

Rain Gear

No matter how clear the skies as you pack for a backcountry trek, prepare for nasty weather. Rain pants and a rain jacket with a hood should serve you well in most situations, especially if, for warmth, you have other clothing to layer beneath your rain gear.

When you are active, moisture from sweat can condense on the inside of your rain gear, making you feel clammy and chilled. To help avoid that feeling, choose rain gear that fits loosely enough to give you freedom of movement and to allow perspiration to vent through the neck, cuffs, and waist. You should also select rain gear made of a breathable fabric that allows moisture to escape but prevents rain and snowmelt from seeping in.




THE SCOUT LAW IS THE LAW OF THIS CAMP
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Being Prepared as a Group



Many people keep things to themselves. They don't want to hold up the team or are worried about what others will think of them. An important step in avoiding backcountry emergencies is letting your companions know when you are having a hard time or if you are aware of something that might affect you or the group.

Remember, stopping for a few moments to deal with a hot spot on a heel can avoid bringing the group to a long halt later in the day when blisters break out. Saying something about changing weather or asking questions about the route that group leaders have chosen can bring important matters to the attention of the rest of your group and help everyone make good decisions.

Being Prepared Yourself

Most important is how you think about things when you are confronted with a survival situation. Learn the right things to do at the right time, then practice these techniques until you know them by heart, and you will build your confidence in dealing with wilderness emergencies.

Keep a Positive Attitude

Many survivors of wilderness emergencies have said that a willingness to survive is the key factor in getting through a difficult situation. You might assume that everyone has an equal desire to survive, but that is not always the case. Some people will endure almost unbelievable conditions while others in much less difficult situations might simply give up and quit. Make a conscious choice to be among those who can and will endure.

One way to avoid panic is to evaluate your resources. What do you and your companions have with you? How can you use these items to make the most of your situation and avoid possible risks?



Learn Survival Skills

Learning how to think about wilderness survival and then mastering skills of staying alive can make all the difference if you ever become lost or face other backcountry emergencies. A good way to begin is by completing the outdoor-oriented requirements for the ranks of Scouting. Earning merit badges like Camping, First Aid, Hiking, Backpacking, Orienteering, and Pioneering can also be helpful. Most of all, spend time in the backcountry having fun, becoming comfortable, and practicing the best ways to take care of yourself in the outdoors.

What to Do When Things Go Wrong

Following the seven priorities of survival in a backcountry or wilderness location will give you a good approach to acting effectively when things don't go as planned. The priorities are listed at right, in order of importance.

1. STOP.
2. Provide first aid.
3. Seek shelter.
4. Build a fire.
5. Signal for help.
6. Drink water.
7. Don't worry about food.

1. STOP

The moment you think you might be lost, stop immediately. If you ever feel fear, stop immediately. Put your hands in your pockets and take a deep breath. Look around and really see what is happening.

If there are immediate dangers to avoid—a potential avalanche, a capsized boat, an approaching bear—do what you must to keep yourself and others safe. You might need to put on your rain gear or step around a tree to get out of the wind. You might also need to provide first aid for life-threatening injuries or illnesses. Once that is done, you can begin to figure out what to do next.

The letters of the word *STOP* hold a special meaning for staying positive and beginning to take charge of a situation.

Stop

Think

Observe

Plan

Stop. At the beginning of a wilderness survival emergency, the most important thing you can do is stop. Once you have taken care of your immediate safety and that of others in your group, then relax as best you can. Drink some water. Eat a snack. You have time. You have resources. You have a good mind. Now is the time to start using it. ***Stop.***

Think. Assemble the group. Use your brain to figure out what is really going on. If you think you are lost, study your map and try to determine where you are. Look around for landmarks. Note the contours of hills, ridges, or mountains, and where you are in relation to streams or lakes.

If you don't have a map, try to remember where you could have gotten off course. What was the last landmark you positively identified? In what direction did you travel from there? If you are on a trail or a road, can you follow it back to your starting point? If you have left footprints in snow, can you retrace your tracks?

Don't go anywhere yet. There is no rush. ***Stop*** and ***Think.***

For many people, the first reaction to a survival situation is to panic. There is fear of the unknown and fear that they don't know what to do next. Without a plan, whatever they do while panicking probably won't be very helpful and might, in fact, make matters worse.



Play the "What if?" game when situations aren't emergencies. If you became lost here, what would you do? What if you needed a shelter and had no tent? What if you needed to start a fire and had no matches?

Observe. Assess the immediate situation. Does anyone need additional first aid? What are the weather conditions? Where is a good place to take shelter? Inventory everything you have in your pack and pockets, and look around to get a sense of the natural resources nearby. What clothing do you have? How can you improvise with what is available to make it suit your needs?

Don't go anywhere yet. There is no rush. ***Stop, Think,*** and ***Observe.***

Plan. When you have figured out what your situation really is, the group can put together a plan for what to do next. Build your plan on what you have observed, what you have in the way of equipment, what you can improvise from native materials, and how you can keep yourself safe. Put into practice the survival steps you have learned, and wait as calmly as you can for help to arrive. Plan carefully and cautiously; don't make your situation worse by acting hastily.

If you left a written trip plan with a responsible person before leaving home, your failure to return on time should trigger a search effort. Most people are found within 24 hours of becoming lost or encountering difficulties in the backcountry. You could, if you had to, survive much longer. ***Stop, Think, Observe,*** and ***Plan.***

The Wilderness Survival First Aid chapter in this pamphlet reviews a number of the injuries and illnesses that might occur in the backcountry. Think about how you would handle these ailments in a survival situation.



2. Provide First Aid

Treat life-threatening injuries and illnesses immediately. As you begin putting together your survival plan, take the time to properly examine anyone who has been hurt, and decide on a course of action to care for that person.

3. Seek Shelter

The body's core is a heat regulator. It does all it can to keep you warm in cold weather and cool in hot weather. If your body gets too hot, you might suffer *heat exhaustion* or *heatstroke.* If it gets too cold, *hypothermia* can set in.

Whatever the weather, if your body's core temperature rises or sinks more than a few degrees from normal, you will find it harder to think and more difficult to function well. In the worst cases, the illnesses of heat and cold can lead to unconsciousness and even death.



Surviving long enough to be rescued can be summed up as doing all you can to help your body maintain its ideal temperature without using more energy than necessary. That means giving it shelter.

Begin by assessing what you have for clothing. Rather than wearing one heavy coat, putting on layers of clothing will allow you to adjust the insulation around you to match the weather conditions you face.

Clothing insulates best when it is dry. Protect the clothing you are wearing from rain and snow by putting on any rain gear you might have or by staying under shelter. Turn a plastic trash bag into a raincoat by cutting slits in it for your arms and head. Keep any clothing you aren't wearing dry by stowing it in a safe place such as your pack, a stuff sack, or a plastic trash bag.

SHELTER STRUCTURES

A shelter extends the effectiveness of your clothing by adding another layer to your insulating and wind-blocking system.

As with all aspects of wilderness survival, assess the materials you have around you and make a plan to build an effective shelter. You will want to assemble a shelter that does the job but that takes as little energy as possible for you to set up.

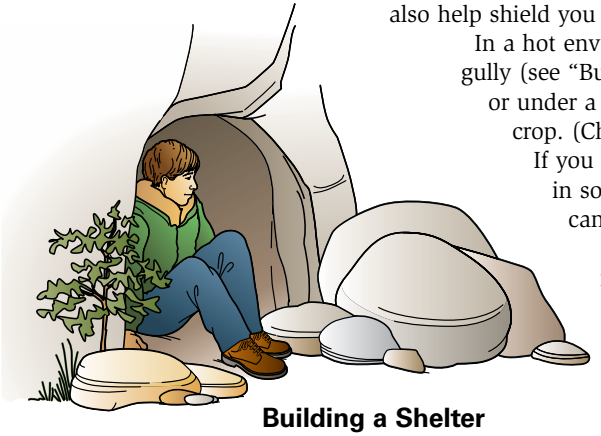
If you have a tent, you are in luck. A dining fly or other tarp can also expand your possibilities. A plastic ground cloth or a poncho with the hood tied closed can also serve as a shelter. Pitch it close to the ground to block the wind.

In a desert, shelter from the sun can be essential for survival.



To help conserve warmth, keep the interior size of a tarp shelter small.

While we often think of a shelter as protection from rain and wind, much body heat can be lost through direct contact with the ground. Insulate the floor of your shelter with a sleeping pad, if you have one, or by piling up evergreen boughs, pine needles, or dry leaves. Sitting on your pack will also help shield you from the chill of bare earth.



In a hot environment, find shade in a small gully (see "Building a Shelter," covered next) or under a tree, large shrub, or rock outcrop. (Check for snakes first, though!) If you are rested, scoop out a hollow in soft ground; it can be significantly cooler beneath the surface.

Train your eyes to recognize instant natural shelters. You will be surprised at all that nature provides if you look closely enough.

Building a Shelter

Before building a shelter, think about how you will build it and then locate the right site for it. The site should be relatively level but sloping enough and high enough to provide adequate drainage. The site should not be exposed to wind or drifting sand or snow. Don't choose a site under dead branches or close to a dead tree that is still standing.

If you will be building your shelter from native materials, is there a sufficient supply nearby? The closer the materials are, the less energy you will use gathering them. Is there a plentiful supply of firewood? Also, evaluate any risk of rockfalls, landslides, flood, avalanches, lightning, or any other hazard.

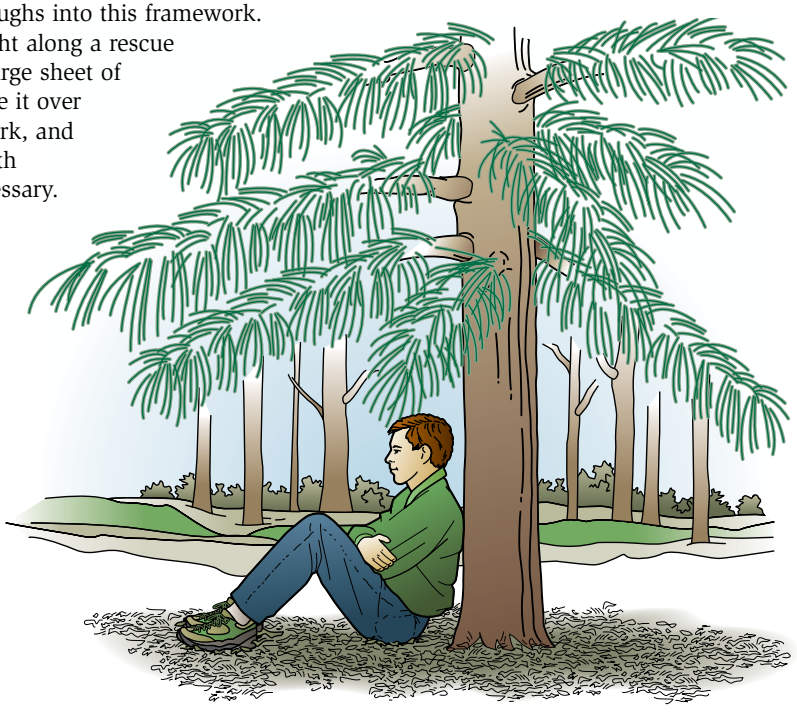
A good site will be near water—one of your priorities for surviving—but not so near that you could be threatened by

flash floods, insects, shifting river courses, or high tides. Visibility from the air should be considered for aircraft trying to pinpoint your location, although if necessary you can set out a signal in a nearby clearing that points to where you are.

A fallen tree or log; a large rock outcrop; an exposed root base; thickly vegetated brush or small spruce, fir, or pine trees; a snapped-over sapling or a lashed tripod—all can be used to improvise a shelter. Always remember that a small shelter means less work to build and less area to heat. *Build the smallest shelter that is adequate for your needs.* A shelter 7 feet long, 3 feet wide, and 2 feet high is large enough for one person in most survival situations. You will probably use it only a night or two anyway.

If using a fallen tree, a rock, or a root base, first build a framework by propping up branches that are 1 to 3 inches in diameter against the *leeward* (downwind) side. Point the tips of the branches downward to form a 60-degree angle with the ground. This will help to shed rain. Then weave smaller branches between the larger ones and work large pieces of bark and boughs into this framework. If you brought along a rescue blanket or large sheet of plastic, drape it over the framework, and anchor it with rocks if necessary.

Pace yourself as you work so that you don't perspire. Your clothing will not keep you as warm if it becomes wet with sweat.





If you are faced with a real survival situation, by all means use live branches. Your life far outweighs any ecological detriment caused by stripping off the boughs you need for shelter. If you lack a ground cloth, you will need a substantial mat of branches to insulate your body from the ground as well. Thickly vegetated brush or small spruce trees can be bunched together and tied off at the top to fashion a fine shelter. By weaving other brush or branches into any gaps, you can weatherproof your shelter to withstand even a wind-driven downpour.



A snapped-over sapling is an effective way to start building your shelter. Pull over a sapling so that it snaps 4 to 5 feet above the ground, but don't break it off completely. Let the top remain hinged to the trunk with the tip resting on the ground; you might need a large rock to hold it down. Then prop branches that are 1 to 3 inches in diameter on both sides similar to the log or rock shelter. Weave in smaller branches, cover it with material, and pile on boughs.

Helping the Wilderness Survive You

The Boy Scouts of America is a strong supporter of Leave No Trace methods of camping, hiking, and all other outdoor activities. Follow the principles of Leave No Trace whenever you are practicing survival skills. Do everything you can to protect the environment, especially as you are building fires and gathering materials for constructing shelters.

However, wilderness situations do not always allow you to practice the low-impact techniques you have been taught. In a real emergency situation, put the safety of yourself and other persons first and take whatever actions you must to survive. Think survival first, low-impact second.

Snow Shelters. Snow can insulate you against the cold and block the wind. The simplest snow shelter is a burrow dug or tramped into a drift. That can provide you with a minimum of protection while you consider your next steps.

More effective shelters include the tree pit, snow pit, snow trench, and snow cave. In each case, you will need a tool for digging and shaping snow. That might be a shovel, a cook pot, a sturdy piece of bark, a stout stick, a license plate, or anything else you can improvise into a tool.

Tree Pit. The area beneath the branches of a large evergreen tree can be nearly free of snow. Crawl underneath and form a small living space. Bare earth radiates some heat, so remove the snow from the tree pit floor if you can. Use a foam pad protected by a ground cloth as insulation beneath you. A fir or spruce tree will shed snow outside of the pit.



Tree pit

Snow Pit. Where snow is deep enough, you can dig a long, narrow pit for an emergency shelter. Form a roof by stretching a tarp or ground cloth over the top of the trench. Weigh down the edges with snow, stones, or branches, then cover the roof with several inches of snow to provide insulation. Insulate the floor of the pit with a sleeping pad if you have one and, when you are inside, fill the entry with your pack or with more snow to keep out the cold. Poke a few ventilation holes near the entrance and check them occasionally to be sure that they remain clear.



Snow pit

Snow Trench. Where the snow is compacted and you have a way to cut it into blocks, shape a 36-inch-deep trench that tapers from 24 inches at the top to 36 to 48 inches at the base. Place the blocks on edge along the sides of the trench, then lean them against each other to form a pitched roof. Insulate the trench floor with a sleeping pad.



Snow trench

Snow Cave. A snow cave provides terrific protection in the worst winter storms. The drawback is that it takes a good deal of time to construct. You will also need to be careful not to get your clothing wet as you dig, either by sweating or by snow melting and soaking into the fabric.

Start excavating a snow cave by burrowing a tunnel into the side of a deep, stable drift, angling the tunnel upward for several feet. Next, excavate a dome-shaped room at the top of the tunnel, judging the thickness of the roof by watching from the inside for a light blue color of the snow that indicates the wall thickness is about right. Smooth the curved roof to remove sharp edges that may cause moisture to drip onto your gear. Finally, use a ski pole, shovel handle, or stick of wood to punch several ventilation holes in the ceiling at a 45-degree angle to the floor. Since the entrance tunnel slants upward, rising warm air won't escape through it and heavier cold air can't seep in.



Mark Your Shelter Location

Whatever shelter you use, make its location obvious to rescuers. Set up tents and tarps where they can be seen from aircraft and by rescuers on the ground. When your shelter is hidden—a snow cave, for example, or the space under an evergreen tree—use native materials or items you have on hand to let others know where you are. Tie spare items of clothing to tree branches. Make flags out of T-shirts or other cloth you can spare. Lay out ground-to-air signals to attract the attention of rescuers in aircraft. (See Ground-to-Air Visual Signal Code in this merit badge pamphlet.)

4. Build a Fire

In chilly and cold weather, a fire can be important for maintaining body warmth, melting snow for water, drying out clothing, signaling for help, and raising your spirits.

The importance of a fire means that you should spend plenty of time getting it right. As with most survival skills, practicing when you are not in an emergency situation is the best way to become good at it. It is especially important to practice using fire-lighting methods other than matches and lighters—a magnifying lens, flint and steel, and fire by friction.

In practicing wilderness survival skills, build fires only where they are allowed by local land management regulations. In a real-life survival situation, use good judgment and extreme care whenever you decide to light a fire.

APPROPRIATE FIRES

A good way to think about a campfire is to consider it a tool to be used for specific and important uses. If you come to the backcountry prepared not to need a fire—carrying a stove and fuel, for example—you can make an informed choice as to whether a fire is appropriate. Be mindful of any temporary bans against open flames in the area.

In a survival situation, you might not have a stove or the clothing and gear to stay warm without a fire. Even so, take time to build your fire in a manner that does not harm the environment. You can do that by following the principles of Leave No Trace.

SELECT A LEAVE NO TRACE CAMPFIRE SITE

A Leave No Trace campfire site has the following qualities:

1. Fire will cause no further negative impact on the land.
2. Fire cannot spread from it, and the area surrounding the site will not be further degraded by the concentrated trampling of people cooking and socializing.

BUILDING A FIRE

Begin by gathering three kinds of flammable material—tinder, kindling, and fuel—and arranging them into a fire lay.

Tinder is fine, dry material that will burst into flame at the touch of a match. Pine needles, the inner bark of dead branches, weed fluff, dry grasses, and slivers shaved with a knife from a stick all are good sources of tinder. Gather a double handful.



Tinder and kindling in place for a tepee fire lay

Kindling is material that will burn with a little encouragement. Twigs no thicker than a pencil are the easiest to find. You will need a small armload.

Fuel is dead and downed wood no bigger than your wrist that you will use to keep your blaze burning. Place fuel wood near the fire lay and protect it with a ground sheet or dining fly.

In wet weather, look for small, dry branches near the bases of trees where larger branches above them have kept off the rain. You can also use a pocketknife to cut away the damp outer layers of a piece of fuel wood until you get down to dry shavings for tinder and kindling. If you happen to have one, use an ax to split wood and expose the dry interior.

In survival situations, gather three or four times as much tinder, kindling, and fuel wood as you would normally want. That way you won't have to run off to gather more flammable material once the fire is burning.



Building a tepee fire lay

MAKING THE FIRE LAY

Prepare a fire lay the right way and your chances of getting it to burn will be high. Then, arrange a good amount of each flammable material in such a way that a flame touched to the base of the tinder will burn up through it, ignite the kindling, and then spread into the fuel. A tepee fire lay works especially well.

Place a big, loose handful of tinder in the center of your fire site. Mound plenty of kindling over the tinder. Then, arrange small and medium-sized sticks of fuelwood around the kindling as if they were the poles of a tepee. Leave an opening in the "tepee" on the side the wind is blowing against so that air can reach the middle of the fire.

FIRE-LIGHTING METHODS

When the fire lay is complete and you have a large supply of additional kindling and fuel wood on hand, ease a flame underneath the tinder. The flame can come from a match or lighter, or can be generated by a magnifying lens, flint and steel, or a fire by friction set.



Matches and Lighters. Preserve your matches by taking plenty of time to prepare your fire before you light it. By ensuring that the tinder catches fire on your first try, you can save the rest of your matches for future fires.

Matches can be carried in a waterproof match case, an empty plastic aspirin bottle with a tight lid, or a resealable plastic bag. If you have a butane lighter, guard it against moisture and cold by keeping it tucked inside a pocket close to your body. Bring it out only when your fire lay is complete and you are ready to ignite the tinder.

Magnifying Lens. On a clear day you might be able to focus sunlight through a curved lens such as that found on the baseplates of some compasses and in eyeglasses, a magnifying glass, camera lenses, binoculars, and telescopes. In some cases, you might need to remove the lens from the instrument in which you found it.

Hold the lens so that the sunlight streaming through it is concentrated down to a bright pinpoint on your tinder. In a few moments it will generate enough heat to cause the tinder to burn.

Tinder for Lighting Fires Without Matches

Very fine tinder is essential for lighting fires with a magnifying lens, flint and steel, or fire by friction. In the field, try shredding the dry inner bark of a cottonwood, elm, or cedar tree, or gathering the fluff from a mouse nest or chipmunk burrow. You can use lint from a clothes dryer, too.



Use caution with dryer lint—it is highly flammable.

You may wish to purchase a specially prepared flint rod to include in your emergency kit. The wheel and flint on an empty lighter also can produce sparks.



Flint and Steel. Striking one hard object against another can sometimes produce sparks. In the backcountry, the most likely objects are a pocketknife and a piece of flint—a dark, shiny stone that fractures easily.

Form your fine tinder (dryer lint works well) into a bird's nest shape the size of a softball. Holding the flint just above the tinder, strike it with the steel to direct the sparks into it. Use a downward motion to strike the steel against an edge of the flint. Nurse a spark into a flame by blowing on it very gently. When the tinder bursts into flame, and the kindling catches fire, push it underneath your fire lay.

Fire by Friction. A skill of old-time Scouts was making a fire using a bow and spindle. For a bowstring, you can use a piece of nylon cord or a shoestring, or a cord off a tent, pack, or tarp. The *spindle* should be made of very dry hardwood—oak, for example. The *hand block* with a depression carved into it to fit the top of the spindle should also be made of hardwood. The *fireboard* is a softer wood that is also dry—cottonwood is a good one to choose. Whittle a notch into the fireboard so that the spindle fits into it, then tuck some very fine tinder beneath the notch.

Twist the bowstring once around the spindle, then hold the spindle upright with one end against the notch in the fireboard. Kneel down and put one foot on the fireboard to keep it from moving. Draw the bow back and forth to twirl the spindle, holding it steady with the hand block. Ideally, the friction created as the spindle turns against the fireboard will cause an ember to form next to the tinder. Gently blow on the ember until the tinder bursts into flame.



Starting a fire without the help of a match or lighter is an important and enjoyable skill to master, but it requires practice. Try out different methods during normal campouts so that you become comfortable with finding and using the right materials. In emergency situations, you will know just what to do.

Call 911 only in case of actual emergencies. Be prepared to give the operator complete information about the nature of the emergency, including your location and your wireless number.

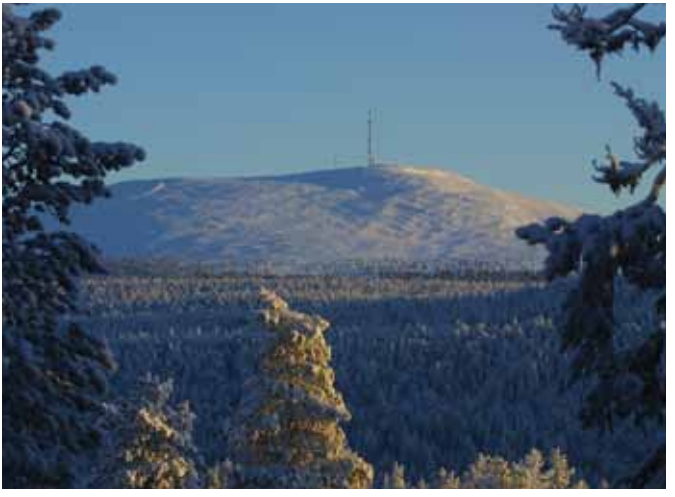
5. Signal for Help

Signaling for help can be very important if you have become lost or if you or others in your group are injured and cannot be moved. Think about where you are, how you might be seen, and what you have on hand to make yourself and your location more visible to others. Consider any and all of the following signaling methods.

Noise. Recognized signals of distress include three blasts on a whistle, three shouts, three bursts from a boat air horn, or three of any other sounds delivered every minute or two.

Electronic Devices. Mobile phones are useful in areas with coverage, but many backcountry areas are out of reach of a cell tower. If possible, research coverage before the trip and carry emergency contact numbers for park ranger stations, local sheriff departments, and other emergency services. Remember to start out with fully charged batteries, and carry extra batteries with you.

If you have a means of electronic communication, try to use it as soon as is practical after assessing your situation and dealing with first aid or other immediate dangers. The sooner others know of your situation, the sooner they can provide assistance, even if it takes a while to reach your location.



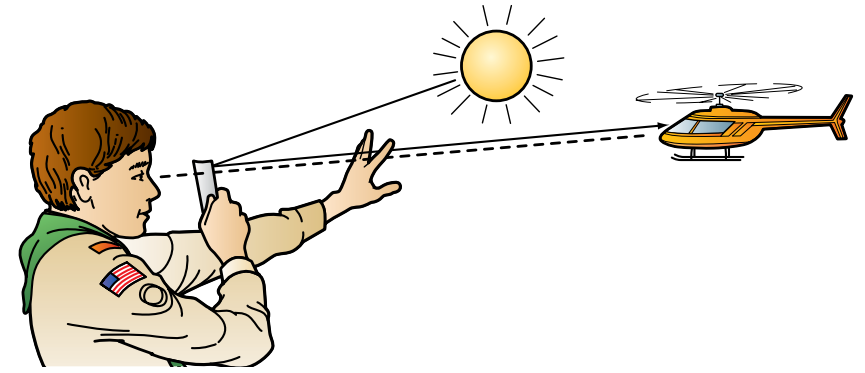
Mobile phones may have limited service in remote locations. Before you leave, find out whether the area you will be visiting has reliable service.

Staying Found

One of the secrets of safe wilderness travel is the use of thumbnail navigation. This technique demands that you be constantly aware of your position. It involves carrying a topographic map of the area that is *readily accessible* (in your pants pocket rather than your pack, for example), and referring to it constantly.



As you hike, you should *continuously* try to match up features around you with points on the map. Periodically, you will come to features (for example, a mountain summit, or a bridge over a stream) that allow you to pinpoint your exact position with precision. In the event that you become disoriented, check your map and determine *how long* it has been since you passed one of these "exact" points on the map. If you have a rough idea of your trail pace, you can then figure how far from this point you could possibly be. This should give you a pretty clear idea of your *general* position on the map.



Signaling with a mirror



Mirrors and Lights. When the sun is shining, the flash of light reflected with a signal mirror can be seen for miles. Aiming it takes practice. Sight a target through the hole in the center of the mirror or by looking just over the mirror's top edge. Hold your extended arm in line with the target and adjust the angle of the mirror so that reflected light illuminates fingers of your hand raised to form a "V" through which you can see the target. If you don't have a signal mirror, you might be able to use a piece of shiny flat metal from an aircraft or remove a rearview mirror from a motor vehicle, or even use the shiny side of a CD or DVD.

At night, use a flashlight to send groups of three flashes in the direction where you believe rescuers might be able to see them.

Flares can be found on airplanes and in some watercraft and motor vehicles and can be effective if you have a rescue aircraft in sight. They are visible for only a short time, though, so save them for the right moment.

Color and Motion. Hanging brightly colored clothing or camping gear on tree branches can catch the rescuers' attention. Flags, banners, and contrasting colors can be part of your signaling efforts. If you can see rescuers, wave a shirt over your head or attach it to a pole and wave it as a flag.

Fire and Smoke. A fire will probably already be part of your survival strategy. The light from it might attract attention at night, and smoke can be seen during the day. Experiment with ways to make a fire smoky by adding pitchy wood, damp leaves, branches, ferns, grasses, and other vegetation to the flames without actually putting out the fire.



As you work, pace yourself to conserve energy and avoid sweating as you lay out your ground-to-air signals.

Ground-to-Air Signals. A simple set of ground-to-air signals will allow you to communicate with searchers flying overhead. Make your symbols as big as you can. Use whatever is on hand to construct symbols that can be seen easily from the air—rocks, overturned sod, piles of branches, and pieces of clothing and equipment. Where snow covers the ground, use your feet to stomp out the shapes of the symbols. Lining the shapes with branches, ashes, soil, or other dark material can make the symbols more visible.

V	X	N	Y	↑
REQUIRE ASSISTANCE	REQUIRE MEDICAL ASSISTANCE	NO	YES	PROCEEDING IN THIS DIRECTION

Ground-to-Air Visual Signal Code

When rescuers arrive by helicopter, stand still and wait until the aircraft lands. A crew member will come to you or provide other guidance about what you should do. Follow his or her instructions exactly.

Shadows. Lay out your ground-to-air signals with an eye toward the sun and you can take advantage of the shadows cast by logs, rocks, and the sides of trenches to make the signals more visible. Orienting the longer legs of signals in a north-south direction will create the most effective shadows, especially early in the morning and late in the afternoon.



6. Drink Water

It bears repeating: Drink plenty of water. Drink plenty of water. Drink plenty of water. You can survive for days without food, but in hot weather without water, only hours. Dehydration happens in cold weather, too, even though you may not feel as thirsty. The best rule is to drink plenty of water—enough so that your urine is clear—whenever you are in the outdoors.

Ideally you will be able to find water where you are—from a lake, a stream, or melting snow, or by guiding rainwater down a tarp or tent fly and into a container. Water may have collected in depressions in rocks, in the crotches of trees, or in seeps along cliffs.

TREATING WATER

Boiling. The surest means of making your water safe is by boiling it. Use a pot or other metal container on a stove or over a fire and bring the water to a full boil.



Chemical Treatment. Water-treatment tablets contain iodine or chlorine to kill waterborne bacteria and viruses. They are effective and easy to use. An emergency survival kit should have a supply of water-treatment tablets.

Filtering. Most backcountry filters are simple handheld pumps used to force water through a screen with pores so small that bacteria and protozoa cannot get through. The finer the screen, the more effective the filter. Information provided with new filters describes their use, maintenance, and the degree of filtration they can provide.





Treat any water you collect before drinking it, but if that isn't possible, drink it anyway. In survival situations, the danger of becoming dehydrated outweighs the possibility of becoming ill.

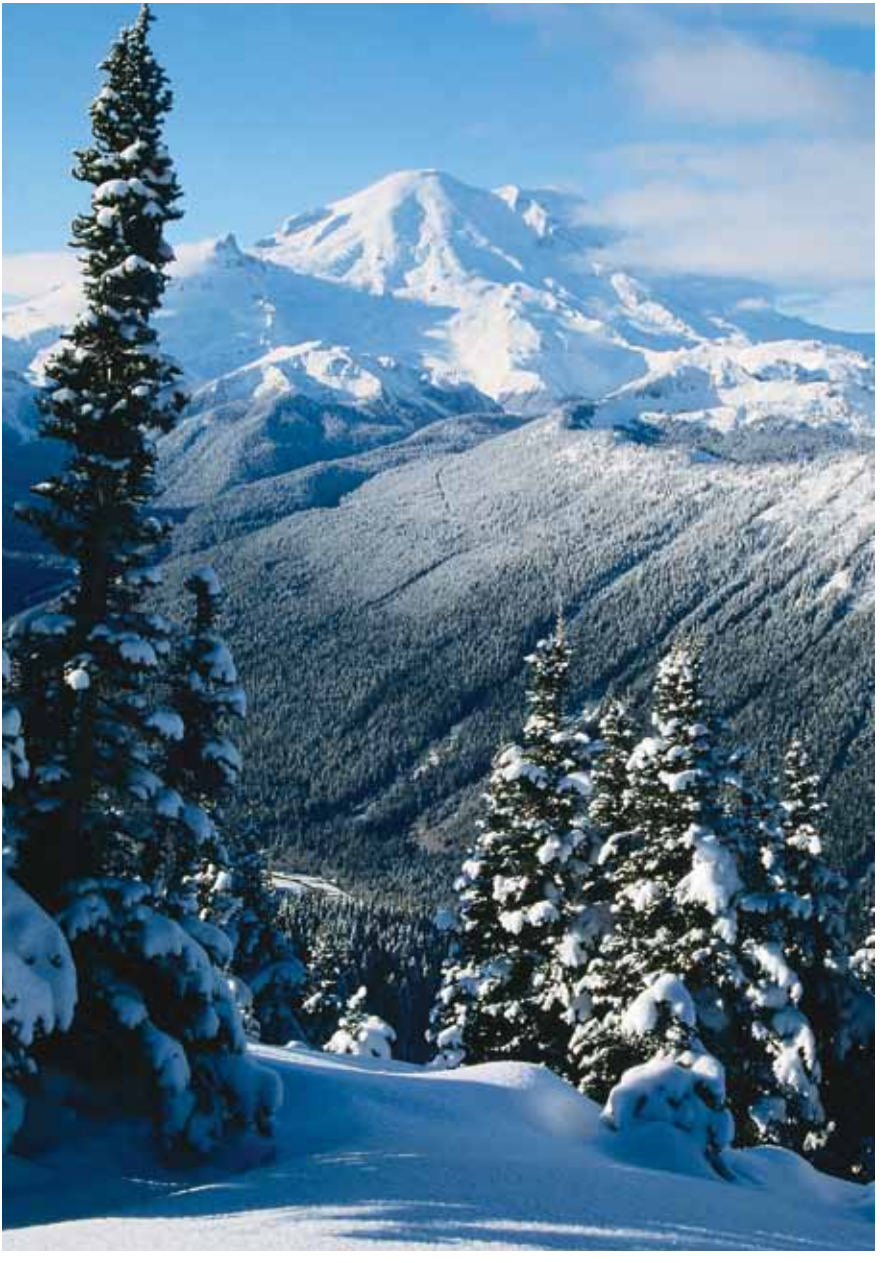
Allow muddy water to stand in a cook pot, bucket, or other container until the silt settles to the bottom. Dip the clear water off the top and remove any remaining organic debris by straining the water through a bandanna or T-shirt into a clean container. Treat it with a filter or water-treatment tablets, or by bringing it to a boil.

7. Don't Worry About Food

Being hungry is not very pleasant, but on the list of survival priorities, it is not very high, either. Keeping warm in cold weather and cool in hot weather, finding shelter, drinking plenty of water, and signaling your location are all more important than finding something to eat.

Once you have taken care of the necessities of survival, you can give some thought to sources of food. You may have the ingredients for camp meals in your pack.

Experts in wilderness survival can tell which plants are safe to eat and which might cause intestinal stress or even poisoning. Unless you are absolutely sure of the identity of a plant and know it is safe to eat, it's best to leave vegetation alone. The same is true of most wildlife. A length of nylon line and a hook can be useful in using insects or worms to catch a fish or two, but in most cases the energy you burn in trying to capture an animal and prepare it to be safely eaten would be better used improving your shelter, gathering water, and taking care of other survival priorities.



Survival Challenges

Certain environmental conditions can pose special challenges for wilderness survivors. Planning ahead for what you would do in each of the following settings will help you prepare to make good decisions.

Cold and Snow

Cold weather brings with it the very real danger of hypothermia. The temperature does not need to be all that low for hypothermia to be a concern. A cool, rainy day, especially if the wind is blowing, can be especially worrisome.

Do all you can to keep yourself warm and dry. Watch those around you for signs that they are becoming chilled. Take steps to find shelter and, if possible, to light a fire.

Snow can also make survival more difficult by burying firewood and the native materials that could be used for making or improving shelters. It is easy to lose gear in the snow. If snow gets into your clothing, it will melt and can chill you.

On the other hand, snow can be an effective resource for building a shelter. It may be as simple as a depression dug into a snowbank so that you can get out of the wind. With more time and energy, you might dig a snow cave or construct a snow trench to create a shelter that will insulate you from the cold.

For more on using snow as a building material, see the information on shelter structures in the "Being Prepared as a Group" chapter.

Be sure to drink plenty of fluids even though you might not feel thirsty. Melt snow over a stove or campfire. If the day is sunny, try laying out a dark-colored plastic trash bag or ground cloth, spreading some snow on it, and letting the sunlight melt it. Shape the snow underneath the plastic to form a depression that captures the water and allows you to dip a cook pot or water bottle into it.

For more on recognizing and dealing with hypothermia, see the Wilderness Survival First Aid chapter at the end of this merit badge pamphlet.

Wet Forests

While forests can offer an abundance of materials for making shelters and building campfires, they can also be challenging, especially if the weather is wet. The shade of a forest floor can feel chilly, and dampness can make it seem even colder. As in other settings, do what you must to keep yourself and others dry and warm, and be on guard against hypothermia.

Dense forests can make signaling to rescuers difficult. You might need to move a short distance to a meadow, stream bank, or other open area visible from an aircraft. Consider your options carefully, though, before changing locations. Mark your route clearly in case you need to find your way back.



Hot and Dry Deserts

While the greatest challenge of desert survival might be staying cool during the day, nights are sometimes cold enough in arid regions for you to need clothing, shelter, and perhaps a fire to keep warm. Rest in a high, shady spot during the day, then complete necessary activities in the cool of the evening or early morning. Wear sun protection if you have it, including long sleeves and a hat. A hat or some type of head cover will help beat the heat, too.

Wind

Wind can make other challenges more difficult to overcome. In hot weather, a wind might help keep you cooler, but it can also sap away moisture and cause you to need to drink water more often. In cold weather, wind can blow warm air away from your body and cause the temperature to seem colder than what is indicated on a thermometer. A steady wind can be exhausting as it hammers away at your energy and morale.

Protect yourself from the wind by wearing a windproof outer layer—a jacket, rain gear, or even a tarp or tent rain fly. Seek shelter on the calm side of a boulder or large tree. If the weather is chilly or cold, watch for any signs of hypothermia.



Oceans, Lakes, and Rivers

Emergencies on water often begin when a watercraft capsizes or when someone falls from shore or from a boat. If that is the case, the first concern is to protect those in the water from drowning. They will need to get to dry land, get back into their watercraft, or stay afloat until help arrives.

If you are in cold water very near the shore, get everyone out of the water as soon as possible to help avoid hypothermia. If you capsize far from shore, try to get as much of your body out of the water as possible by climbing on the capsized craft. If that is not possible, conserve energy and body heat by floating with your personal flotation device and clothing on, your head positioned so that you can breathe, and your legs drawn up close to your trunk. Huddle together with others if you are not alone.



To ride out the rapids in a river before swimming to safety or catching a rescue line, go downstream feetfirst with your legs acting as shock absorbers to fend off rocks. Use a backstroke to maneuver past obstacles, and watch for eddies that might protect you.

A capsized canoe, boat, or other watercraft, even if damaged, might stay afloat. It is also more visible than a person alone in the water. Canoes and small boats can sometimes be righted, but don't waste much energy in the effort. You can climb into a swamped boat and it should still keep you on the surface. If that isn't possible, hang onto the side of the boat and use it to help you rest and keep your head above water.

When a survival situation involves a life raft, look for storage compartments containing an emergency kit that might contain first-aid supplies, water, signaling devices, and emergency food. Follow the instructions included with the kit.

If you are stranded at sea or on the coastline of an ocean, don't drink the salt water. The mineral content will cause your body to dehydrate more quickly than if you drank no seawater at all.

Instead, stay in the shade to keep from sweating away more moisture than necessary. On shore, try to locate streams, springs, and other sources of fresh water. If you are stranded on a watercraft, be ready to collect water from rain or morning dew.

Risks from emergencies on the water can be greatly reduced if everyone wears an approved personal flotation device, even for short boat rides. Remember that a PFD is required for all BSA activities afloat.

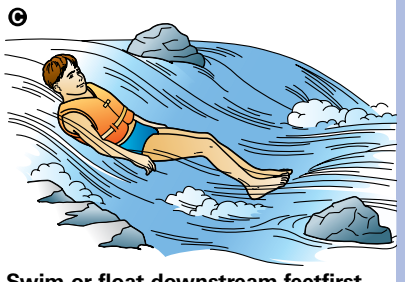
Surviving in the Water



Heat escape lessening posture (HELP)



Huddle together with sides touching.



Swim or float downstream feetfirst.



Stay with your boat unless you are very close to shore.

A. If you must stay in the water, your chances of survival are greater if you assume the *HELP* or *huddle* position, depending on whether or not you have others with you. In a cold-water situation, float motionless with your PFD and clothes on, your head out of the water, and your legs drawn up close to your trunk.

B. To help conserve energy in cold-water situations, use the huddle position if you are not alone.

C. If your boat capsizes in a river, don't fight the current. Get on your back with your feet pointed downstream. This way, it will be your feet that strike against rocks rather than your head. Use a backstroke to help maintain your position in the water, and the current will soon carry you into shallow water.

One of the most common causes of small-boat accidents is overloading. Know what your boat can safely hold and never exceed the limit.

Motoring (On-Road or Off-Road Vehicles)

The ease of traveling into many backcountry regions by motorized vehicle can cause people to forget to take steps to prepare for wilderness survival. A snowmobile, all-terrain vehicle, motorbike, or even a four-wheel-drive SUV can seem very safe because it can get us places quickly. However, should a vehicle run out of fuel or break down, you can find yourself every bit as stranded as if you had hiked to a remote location. Let someone know where you are going and when you will return. Be clear about your route so that if you need to be found, searchers will know where to look.

Be prepared for the *worst* weather that could occur. Have everyone traveling in the vehicle pack extra clothes for the trip.

Many vehicles can be equipped with survival equipment so that you will always have what you need. Include a first-aid kit, extra food and clothing, and basic repair items for the vehicle itself.

If a vehicle you are traveling in does break down, stay close to it. Three of anything—three blinks of the headlights, three honks of the horn—repeated every few minutes will tell others in the vicinity that you are in trouble. Conserve battery power by using the lights and horn just for signaling.

In winter conditions, stay in the vehicle. Turn the engine on every 20 minutes or so to briefly warm up the interior. Leaving the dome light on at night will not use much battery power and will make it easier for rescuers to spot you.

Hike out only if a main roadway is nearby and there is no doubt you can reach it. Your decision might be influenced by the fact that someone in your group is sick or injured and must have medical help soon.



If your vehicle breaks down, signal for help with headlights, emergency flashers, and horn blasts, repeated in sets of three every few minutes.

Flying

Among the more dramatic survival situations are those created when an airplane goes down. Pilots file flight plans and aircraft carry locator beacons to help make it easier to locate and rescue survivors of plane crashes and forced landings, as well as those involved in parasailing and skydiving accidents. Those who are stranded with a downed aircraft should stay close to the wreckage.

To increase the possibility for survival, passengers in private aircraft should pack extra clothing. The weather might be warm when the plane lifts off but much colder in the high country along the aircraft's route.


TROOP

Protecting Yourself in the Wilderness

Making good choices to protect yourself from insects, reptiles, and wild animals is one of the many challenges of wilderness survival. Keep this information in mind on any hike, campout, or other situation where you are sharing the backcountry with wildlife, small and large.

Insects

Mosquitoes, chiggers, black flies, and other biting insects can make you miserable in the outdoors, and that can threaten morale. If you have it, use insect repellent. Wear a long-sleeved shirt, long pants, and a hat. Tie a bandanna around your face or use a spare T-shirt to protect your head. Guard your hands with gloves or pull a pair of socks over them. Try smoothing a layer of mud on exposed skin. Build a fire and stay close to the smoke. Consider moving to higher ground that might be breezier and less infested with bugs.

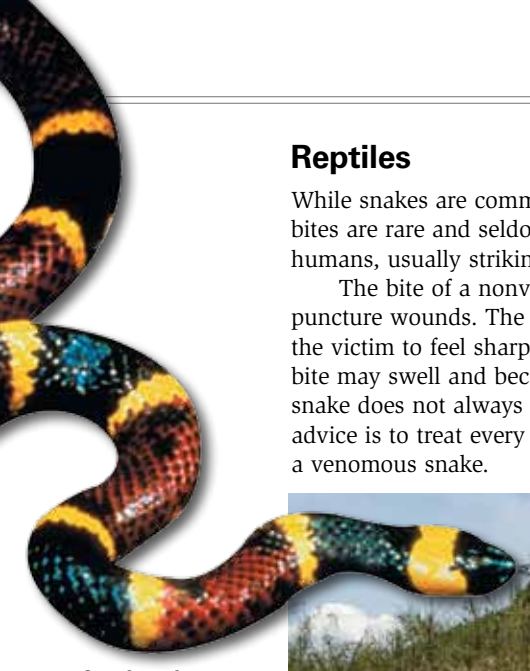
For information on treating insect and reptile bites, see the Wilderness Survival First Aid chapter in this merit badge pamphlet.



Reptiles

While snakes are common in many parts of the country, snakebites are rare and seldom result in death. Snakes try to avoid humans, usually striking only when cornered.

The bite of a nonvenomous snake causes only minor puncture wounds. The bite of a venomous snake may cause the victim to feel sharp, burning pain. The area around the bite may swell and become discolored. However, a venomous snake does not always inject venom when it bites. The best advice is to treat every snakebite as if it were inflicted by a venomous snake.



Coral snake

Before you go, find out what kinds of wildlife inhabit the area you plan to visit. Doing so will help you be prepared in case you have a close encounter with a predator or other wild animal.



A hiking stick does double duty when you walk through places where snakes are common. Walk slowly and use the stick to lead you.

Use a hiking stick to poke among stones and brush ahead of you when you walk through areas where snakes are common. Watch where you put your hands as you collect firewood or climb over rocks and logs.

Predatory Animals

Be especially aware of the kinds of predatory animals you might meet during your adventures. Wolves, coyotes, and cougars (or panthers and pumas) are curious. So, if you happen upon such an animal, face the creature and slowly retreat from the area. Do not approach the animal, run, or play dead. Make yourself as "big" as possible by waving your arms and clothing above your head. Make a lot of noise. If you have no escape or become cornered, throw rocks and sticks. Remember, no matter what kind of wild animal, give all wildlife a wide berth—especially young animals and their mother.

Bears. Bears are part of many backcountry ecosystems. The same guidelines Scouts follow to keep bears and themselves safe during outdoor adventures can be adapted during survival emergencies to allow people and bears to share the same wilderness areas without incident. You might need to adapt some of these guidelines to fit the circumstances of a survival situation.



American black bear

Bear-Safety Checklist

- ❑ While hiking, alert bears to your approach by making noise. Never approach or provoke a bear. If you encounter a bear, do not run or shout. Stay calm, back away, and avoid eye contact with the bear.
- ❑ Set up your sleeping area at least 200 feet away from where you will cook and eat.
- ❑ Allow no smellables—food-soiled clothing, deodorant and antiperspirant, soap—in sleeping tents.
- ❑ Clean up and pack out any spilled food, food particles, and campsite trash.
- ❑ Use a bear bag, bear box, or bear canister to protect all unattended smellables.
- ❑ Dispose of dishwater at least 200 feet from your campsite and sleeping area.
- ❑ Wash early in the day. Avoid using scented lotions, soaps, deodorants, or shampoos.
- ❑ Change into clean sleeping clothes before going to bed.



Wilderness Survival First Aid

This merit badge pamphlet has explained a method of surviving wilderness emergencies by addressing the following steps.

- STOP (Stop, Think, Observe, Plan).
- Provide first aid.
- Find shelter.
- Build a fire.
- Signal for help.
- Drink water.
- Don't worry about food.

Providing first-aid care is high on the list, especially if you or someone with you has suffered serious injuries or illness. The first-aid emergencies described below are those that you might encounter in the backcountry. The treatments are ways to manage these risks until help can arrive.

You can also prepare for backcountry emergencies by completing training in caring for injured and ill persons in remote settings. Among the courses available in various parts of the country are those for American Red Cross Wilderness First Aid Basic, Wilderness First Responder, Wilderness Emergency Medical Technician, and Mountaineering Oriented First Aid. Check with your BSA local council for opportunities in your area.

The first-aid treatments described here are those that can be used under ideal circumstances. Wilderness survival situations might make it necessary for you to improvise. In any case, do the best you can with the knowledge and the resources you have at hand.

There is always more you can learn about first aid. The *Boy Scout Handbook, Fieldbook,* and *First Aid* merit badge pamphlet give additional information about first aid. Earning the First Aid merit badge is a good way to continue to build your skills.

Hypothermia

Hypothermia occurs when a person's body is losing more heat than it can generate. It is a danger for anyone who is not dressed warmly enough, though simple exposure to cold is seldom the only cause. Dehydration is a common factor. Wind, damp clothing, hunger, and exhaustion can compound the danger. The temperature doesn't have to be below freezing, either. A lightly dressed hiker caught in a cool, windy rain shower can be at great risk. So is a swimmer too far out in chilly water or immersed too long.

A person experiencing hypothermia might feel cold and numb; become tired, anxious, irritable, and increasingly clumsy; have slurred speech; shiver uncontrollably; make poor decisions; and lose consciousness.



The first step in treating hypothermia is preventing the victim from getting any colder.

Treating Hypothermia. There are some general guidelines for treating a victim of hypothermia. For starters, prevent the victim from getting colder and, if necessary, use any or all of the following methods to help the body warm again to its normal temperature.

- If the person is fully conscious and can drink, offer small amounts of warm liquids (cocoa, soup, fruit juices, water).
- Move the person into the shelter of a building or a tent and into dry, warm clothes.

- Zip the person into a dry sleeping bag. Cover the head with a warm hat or sleeping bag hood.
- Provide water bottles filled with warm fluid to hold in the armpit and groin areas.

If hypothermia is advanced, aid in rewarming the victim. Be sure to watch the person closely, and be ready to administer other first aid if necessary. Seek medical care.

When you suspect someone is suffering from hypothermia, challenge the person to walk, heel to toe, a 30-foot line scratched on the ground. If the person shows unsteadiness, loss of balance, or other signs of disorientation, take immediate action to get the victim warm and dry.

Frostbite

A frostbite victim may complain of pain on the ears, nose, fingers, or feet and then numbness, but sometimes the victim won't notice anything. You may see grayish-white patches on the skin—a sure sign of frostbite.

Treating Frostbite. Get the victim into a tent or other shelter, then warm the injury—and keep it warm. If an ear or cheek is frozen, remove a glove and warm the injury with the palm of your hand. Slip a frostbitten hand under your clothing and tuck it beneath an armpit. Treat frozen toes by putting the victim's bare feet against the warm skin of your belly. Avoid rubbing frostbitten flesh, as that may damage tissue and skin.

You can also warm a frozen part by holding it in warm—never hot—running water. Or wrap it in a dry blanket. Have the victim exercise injured fingers or toes, and do not let the injured area freeze again. Get the victim to a doctor.



Your own body heat can help treat frostbite.

Dehydration

Water is essential for nearly every bodily function, including digestion, respiration, brain activity, producing heat, and staying cool. A person who gives off more water than he or she takes in risks becoming *dehydrated.* The first sign of dehydration usually is dark urine. Other signs can include weariness, headache and body aches, and confusion. Heat exhaustion, heatstroke, and hypothermia may all be caused in part by dehydration.

Be sure you stay well-hydrated even when conditions are cold outside.

Treating Dehydration. Protect yourself from dehydration by drinking plenty of fluids. That is easy to do on hot summer days when you are thirsty, but it is just as important in cold weather when you may not feel thirsty. Drink enough so that your urine stays clear and lightly colored, not dark amber.



Heat Exhaustion

Heat exhaustion can be brought on by a combination of dehydration and a warm environment. It is not uncommon during outdoor activities conducted in hot weather, especially if participants are not fully acclimated to the conditions. Symptoms can include pale and clammy skin caused by heavy sweating, nausea and tiredness, dizziness and fainting, headache, muscle cramps, and weakness.



Victims of heat exhaustion should be cooled down as quickly as possible.

Treating Heat Exhaustion. Place the person in the shade and encourage the victim to drink fluids, ideally cool water. Hasten the cooling process by applying wet cloths to the skin and then fanning the person. Activities can resume when the person feels better, though it can take a day or more for full recovery.

Heatstroke

Heatstroke occurs when a person's core temperature rises to life-threatening levels (above 105 degrees). Dehydration and overexertion in hot environments can be factors. Symptoms can include hot, sweaty, red skin; confusion and disorientation; and a rapid pulse.

Treating Heatstroke. Get the patient under qualified medical attention as quickly as possible, monitoring the person closely during evacuation to guard against a relapse. The person's temperature must be lowered quickly and hydration restored. Move the victim to a shady location and loosen tight clothing. If the person is able to drink, give small amounts of cool water. Pour water on the person and further cool by fanning. If you have them, wrap ice packs in a thin barrier (such as a thin towel) and place them under the armpits and against the neck and groin.

Sunburn

Sunburn is a common but potentially serious result of overexposure to the sun. Long-term exposure can result in skin damage and increase the risk of skin cancer. In survival situations, serious or extensive sunburn can be painful enough to limit a person's ability to function well.

Treating Sunburn. The best treatment for sunburn is prevention. Limit your exposure to the sun, wear loose-fitting clothing that covers your arms and legs, and wear a broad-brimmed hat to shade your neck, ears, and face. Protect exposed skin by liberally applying sunscreen with a sun protection factor (SPF) of at least 15; reapply it often. If you have no sunscreen, stay in the shade as much as possible, especially in the middle of the day when the sun's rays can be most damaging. Smoothing a layer of mud on exposed skin can offer some protection, too.



Minor Injuries

Minor cuts and scrapes usually require only cleaning and disinfecting with soap and water. Allow them to heal in the air, or cover them lightly with a dry, sterile dressing or bandage to help prevent infection. Unless a cut is serious, bleeding probably will stop on its own or with slight pressure on the wound.

If a wound is so severe that it does not stop bleeding readily, apply direct and firm pressure using a sterile dressing or compress. It may help to raise the injured limb (if no bones are broken) above heart level. If the bleeding is prolonged, treat for shock and seek medical attention immediately.

People with diabetes should seek professional medical care for their blisters, which can quickly become infected.

Treating Blisters

A *hot spot* is a warning that a blister may be forming. Treat a hot spot or blister as soon as you notice it. Gel pads can be taped directly over a hot spot or blister to reduce friction and speed healing. Follow the instructions on the package.

To treat a hot spot or blister with moleskin, cut the moleskin slightly larger than the shape of the blister. Used together, a gel pad and moleskin can provide maximum relief for hot spots and blisters. Change bandages every day to help keep wounds clean and avoid infection.



Honeybee

Tick, Chigger, and Spider Bites and Stings

The bites or stings of insects, ticks, chiggers, and spiders can be painful. Some may cause infection.

Treating Stings. To treat bee stings, scrape away the stinger with the edge of a knife blade. Don't squeeze the sac attached to the stinger—that might force more venom into the skin. Use an ice pack to reduce pain and swelling.

Treating Tick Bites. Ticks are small, blood-sucking creatures that bury their heads in the skin. Protect yourself whenever you are in tick-infested woodlands and fields by wearing long pants and a long-sleeved shirt. Button your collar and tuck the cuffs of your pants into your boots or socks. Inspect yourself daily, especially the hairy parts of your body, and immediately remove any ticks you find.



Tick

If a tick has attached itself, grasp it with tweezers close to the skin and gently pull until it comes loose. Don't squeeze, twist, or jerk the tick, as that may leave its mouth parts buried in the skin. Wash the wound with soap and water, and apply antiseptic. After dealing with a tick, thoroughly wash your hands.

Treating Chigger Bites. Chiggers are almost invisible. They burrow into skin pores, causing itching and small welts. Try not to scratch chigger bites. You may find some relief by covering a chigger bite with calamine lotion or by dabbing it with clear fingernail polish or mud.

Treating Spider Bites. The bite of a female black widow spider can cause redness and sharp pain at the wound site. The victim may suffer sweating, nausea and vomiting, stomach pain and cramps, severe muscle pain and spasms, and shock. Breathing may become difficult and convulsions may occur.

The bite of a brown recluse spider might not hurt right away, but within two to eight hours there can be pain, redness, and swelling at the wound. An open sore is likely to develop. The victim may suffer fever, chills, nausea, vomiting, joint pain, and a faint rash.



Black widow spider

Victims of spider bites should be treated for shock and be seen by a physician as soon as possible.

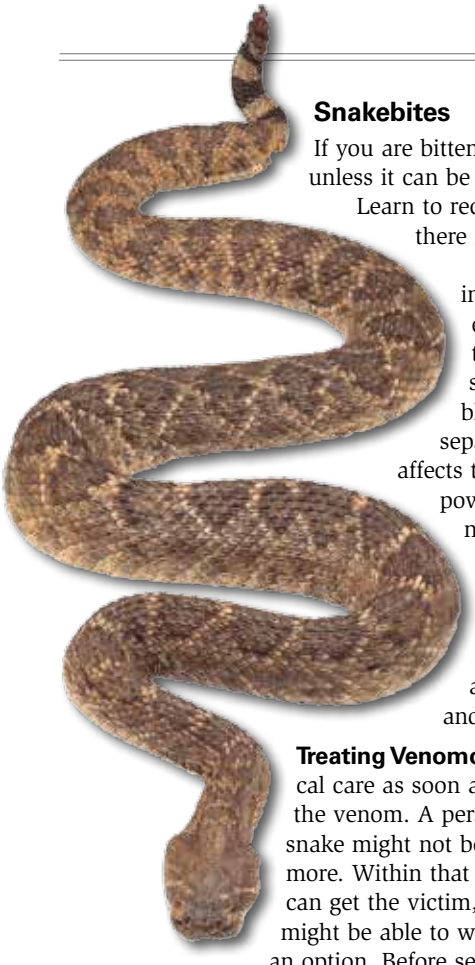
Anaphylactic Shock

In rare cases, stings or bites of insects can cause *anaphylactic shock,* a condition that restricts breathing passages and requires immediate treatment by a physician or a person trained in emergency first aid. People who are allergic to peanuts, shellfish, and certain other foods can have similar reactions if they ingest those items.

Travelers who know they are susceptible to anaphylactic reactions (and anyone dealing with asthma) should consult with their physicians to prepare themselves for the outdoors with strategies and treatment kits, and should share that information with the leaders of their groups. For example, the emergency kits carried by people who know they might suffer from anaphylactic shock often include an EpiPen® for injecting a measured dose of epinephrine. If you have any medical conditions, let others in your party know so they will know how to respond in case of emergency.



EpiPen®



Rattlesnake

Snakebites

If you are bitten by a snake, assume that it is venomous unless it can be absolutely identified as nonvenomous. Learn to recognize venomous varieties to know when there is danger and what action to take.

Two types of venomous snakes are found in the United States. Pit vipers (rattlesnakes, copperheads, cottonmouths) have triangular-shaped heads with pits on each side in front of the eyes. Coral snakes have black snouts and bands of red and yellow separated by bands of black. Pit viper venom affects the circulatory system; coral snakes inject a powerful venom that works on the victim's nervous system.

Treating Nonvenomous Snakebites. The bite of a nonvenomous snake requires only ordinary first aid for small wounds—scrub with soap and water, then treat with an antiseptic. Snakes are not warm-blooded and so cannot carry rabies.

Treating Venomous Snakebites. Get the victim under medical care as soon as possible so that physicians can neutralize the venom. A person who has been bitten by a venomous snake might not be affected by the venom for an hour or more. Within that time, the closer to medical attention you can get the victim, the better off he or she will be. The victim might be able to walk, but carrying the victim also might be an option. Before setting out, do the following.

- Encourage the patient to stay calm; reassure the person that he or she is being cared for.
- Remove rings and other jewelry that may cause problems if the area around a bite swells.
- Immobilize a bitten arm with a splint and a sling, keeping the wound lower than the level of the victim's heart.

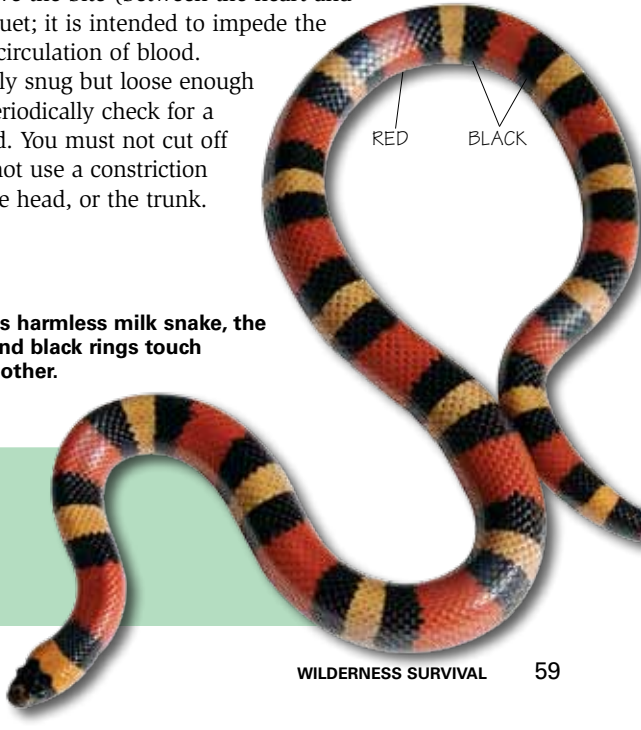
Just as important are these **don'ts** for the treatment of a snakebite.

- **Don't** make any cuts on the bite, apply suction, apply a tourniquet, or use electric shock (such as from a car battery). All of these so-called remedies can cause more harm to the victim and are not proven to be effective.
- **Don't** apply ice to a snakebite. Ice will not help the injury but may damage the skin and tissue.
- **Don't** give the victim alcohol, sedatives, or aspirin. Doing so could speed up the absorption of venom, aggravate nausea, or could fuel fear and panic in the victim.

Treat for shock, but keep a bitten extremity lower than the heart.

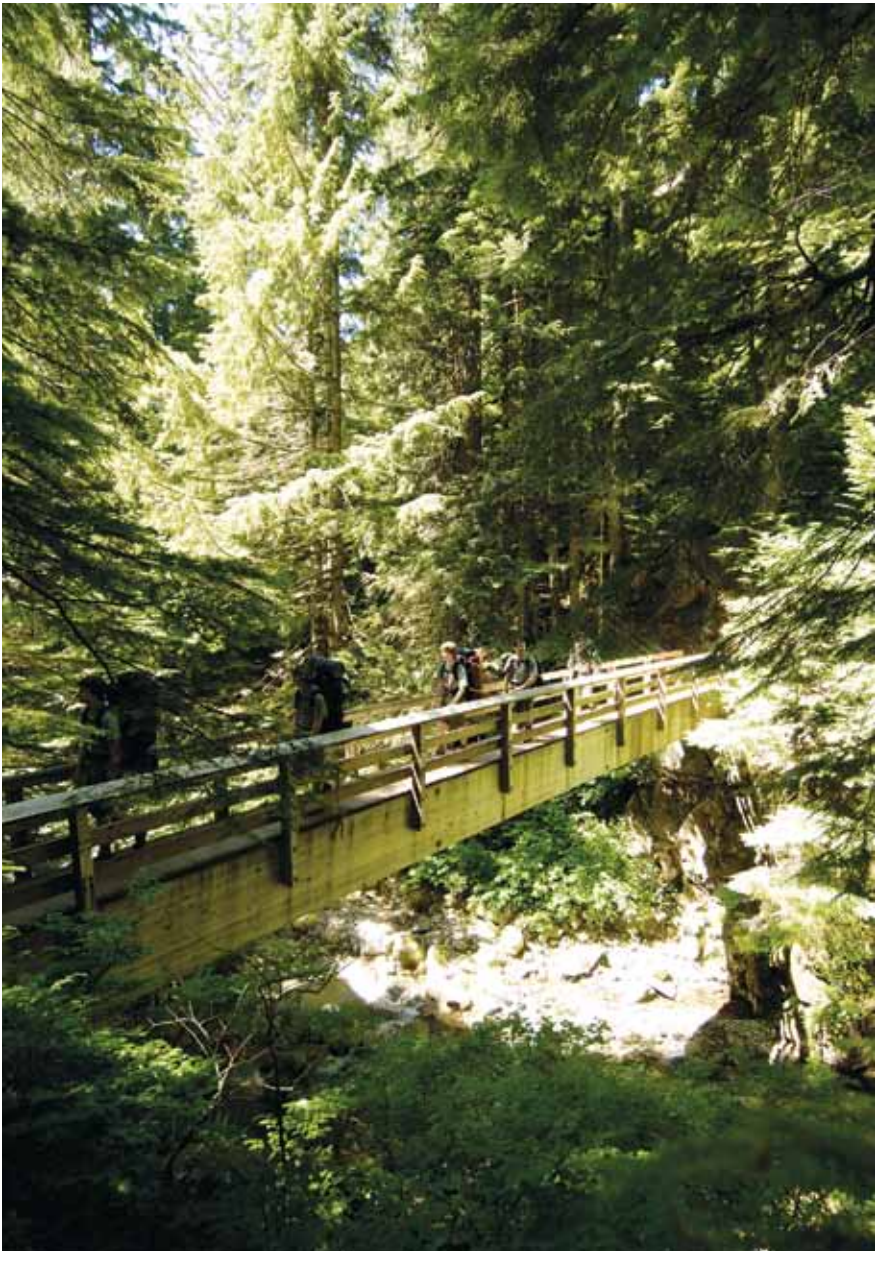
If the victim must wait for medical attention to arrive, have the victim lie down and remain still. Position the injured area lower than the victim's heart, and immobilize the bitten limb with a splint. For the bite of a coral snake, to slow the spread of venom, wrap the area with a bandanna or strip of cloth at least 1 inch wide, 2 to 4 inches above the bite (between the heart and the bite). This is not a tourniquet; it is intended to impede the lymphatic system but not the circulation of blood.

Make the band comfortably snug but loose enough to slip a finger under easily. Periodically check for a pulse on *both sides* of the band. You must not cut off blood circulation entirely. Do not use a constriction band around a finger, a toe, the head, or the trunk.



In this harmless milk snake, the red and black rings touch each other.

Remember this ditty for safety around coral snakes: red and black—friendly jack; red and yellow—deadly fellow.



A Final Word

Outdoor adventures are among the highlights of Scouting. Plan ahead and prepare so that you don't get into survival situations. Nearly every time, you and those in your group will be fine.

Go to the backcountry with the understanding that there are risks to be managed, and that sometimes emergencies can arise. When they do, use your skills, the gear you have with you, and the resources around you. Keep a positive attitude, and don't ever give up. Do your best and expect good things to happen. That is the heart of wilderness survival.



Wilderness Survival Resources

Scouting Literature

Boy Scout Handbook; *Fieldbook; Deck of First Aid; Emergency First Aid* pocket guide; *Basic Illustrated Wilderness First Aid; Be Prepared First Aid Book; Backpacking, Camping, Canoeing, Emergency Preparedness, First Aid, Lifesaving, Orienteering, Safety,* and *Weather* merit badge pamphlets

Visit the Boy Scouts of America's official retail Web site at *http://www.scoutstuff.org* for a complete listing of all merit badge pamphlets and other helpful Scouting materials and supplies.

Books

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Forgey,William W. *Basic Essentials: Wilderness First Aid,* 3rd ed. Falcon Guides, 2006.

Gill, Paul G. *Wilderness First Aid.* Ragged Mountain Press, 2001.

Harvey, Mark. *National Outdoor Leadership School's Wilderness Guide: The Classic Handbook.* Fireside, 1999.

Isaac, Jeffrey. *The Outward Bound Wilderness First Aid Handbook.* The Lyons Press, 1998.

Keller, William. *Keller's Outdoor Survival Guide: How to Prevail When Lost, Stranded, or Injured in the Wilderness.* Willow Creek Press, 2001.

Randall, Glenn. *Outward Bound Map and Compass Handbook.* The Lyons Press, 1998.

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Storm, Rory. *The Extreme Survival Guide.* Houghton Mifflin, 1999.

Tawrell, Paul. *Camping and Wilderness Survival.* Falcon Distribution, 1996.

Videos

More Wilderness 911. DVD. Wellspring Media, 1998.

Survival Basics, Vol. 1, and *Survival Basics, Vol. 2.* DVD. Tapeworm, 2000.

The Unexplained—Wilderness Survival. DVD. A&E Home Video, 2001.

Organizations and Web Sites

Association of Outdoor Recreation and Education
P.O. Box 1000
Ferrum, VA 24088
Telephone: 540-484-1380
Web site: *http://www.aore.org*

Backpacker Magazine
Web site: *http://www.backpacker.com*

Equipped to Survive
Web site: *http://www.equipped.org*

Guide to Safe Scouting on Scouting.org
Web site: *http://www.scouting.org/scoutsource/HealthandSafety/GSS.aspx*

National Outdoor Leadership School (NOLS)
284 Lincoln St.
Lander, WY 82520-2848
Toll-free telephone: 800-710-6657
Web site: *http://www.nols.edu*

Outdoors Magazine
Web site:
http://www.outdoorsmagazine.net

Outside Magazine
Web site: *http://outside.away.com*

Wilderness Education Association
900 E. 7th St.
Bloomington, IN 47405
Telephone: 812-855-4095

Wilderness Survival
Web site:
http://www.wilderness-survival.net

Wildwood Survival
Web site:
http://www.wildwoodsurvival.com/survival

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American Business	2002
American Cultures	2005
American Heritage	2005
American Labor	2006
Animal Science	2006
Archaeology	2006
Archery	2004
Architecture	2008
Art	2006
Astronomy	2004
Athletics	2006
Automotive Maintenance	2008
Aviation	2006
Backpacking	2007
Basketry	2003
Bird Study	2005
Bugling (*see* Music)	
Camping	2005
Canoeing	2004
Chemistry	2004
Cinematography	2008
Citizenship in the Community	2005
Citizenship in the Nation	2005
Citizenship in the World	2005
Climbing	2006
Coin Collecting	2008
Collections	2008
Communication	2009
Composite Materials	2006
Computers	2009
Cooking	2007
Crime Prevention	2005
Cycling	2003
Dentistry	2006
Disabilities Awareness	2005
Dog Care	2003
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Electricity	2004
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Emergency Preparedness	2008
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Family Life	2005
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Fingerprinting	2003
Fire Safety	2004
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Motorboating	2008
Music and Bugling	2003
Nature	2003
Nuclear Science	2004
Oceanography	2009
Orienteering	2003
Painting	2008
Personal Fitness	2006
Personal Management	2003
Pets	2003
Photography	2005
Pioneering	2006
Plant Science	2005
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Public Health	2005
Public Speaking	2002
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Reptile and Amphibian Study	2005
Rifle Shooting	2001
Rowing	2006
Safety	2006
Salesmanship	2003
Scholarship	2004
Scuba Diving	2009
Sculpture	2007
Shotgun Shooting	2005
Skating	2005
Small-Boat Sailing	2004
Snow Sports	2007
Soil and Water Conservation	2004
Space Exploration	2004
Sports	2006
Stamp Collecting	2007
Surveying	2004
Swimming	2008
Textile	2003
Theater	2005
Traffic Safety	2006
Truck Transportation	2005
Veterinary Medicine	2005
Water Sports	2007
Weather	2006
Whitewater	2005
Wilderness Survival	2007
Wood Carving	2006
Woodwork	2003

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