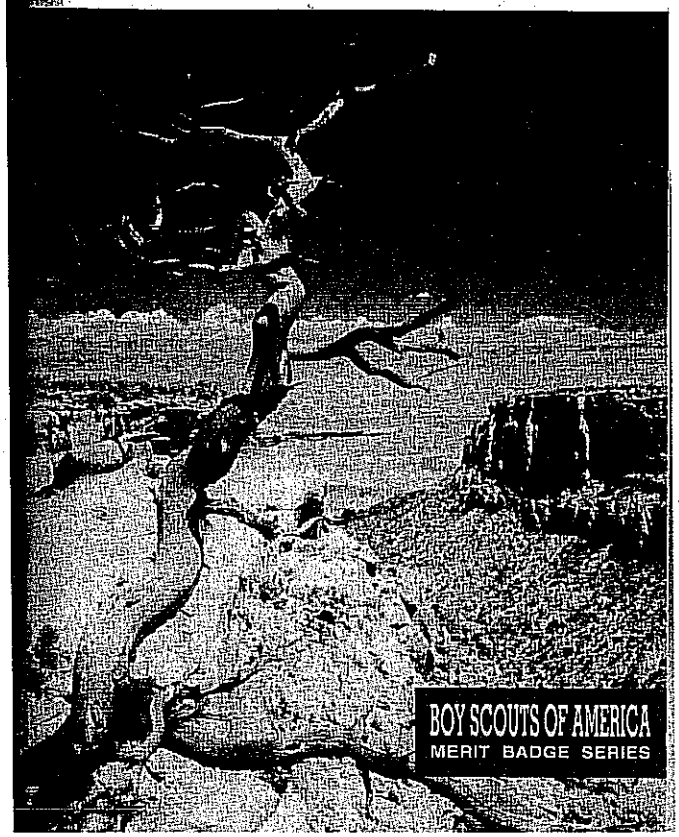
WILDERNESS SURVIVAL



BOY SCOUTS OF AMERICA
MERIT BADGE SERIES

Introduction

As you begin your study of wilderness survival, your main goal is to learn the techniques needed to earn your Wilderness Survival merit badge. As a result of your efforts, you not only will achieve your merit badge, you will become a special person, one who can be counted on in an emergency. Your knowledge of survival and your ability to use this knowledge intelligently could save your life... and the lives of others.

As you study to earn this badge, your counselor will help you adapt material in this pamphlet to your own part of the country. Your counselor will be able to add details and practical information not included in these pages.

A buddy system can make learning wilderness survival easier and more fun as you review information and conduct field exercises. You can learn from each other, spotting errors and incorrect methods before they become bad habits.

When you have earned your badge, you will have learned important information on survival that you will continue adding to all your life. You will enjoy your outdoor experiences, confident that you can handle any emergency that arises.

What Wilderness Survival Means

There are two basic kinds of survival situations: the planned and the unplanned. Occasionally, one or more people may go into a wilderness area as part of a survival training exercise, taking along a minimum of supplies and equipment. What most of us consider a survival situation falls into the second category—the unplanned event. Here are some typical instances:

As darkness falls, a hunter tries to save time returning to camp and takes a shortcut. He becomes lost. He must make the right survival moves or he will be in real danger.

A sudden lake squall capsizes a canoe. The occupants manage to paddle the capsized canoe to shore. It is late in the day, the temperature is close to freezing and they are beginning to suffer from hypothermia. Like the lost hunter, they have very little daylight left.

Two hikers are in the hills. One falls and breaks a leg. He also may have internal injuries. It is the responsibility of the uninjured hiker to give first aid and make important emergency decisions.

A four-wheeler breaks down crossing the desert. The weather is hot and dry, water is limited and help is many miles away. The driver must cope with the dangers of heat exhaustion and heat stroke, and must decide whether to stay with his vehicle or attempt to walk out.

The variations of wilderness emergencies are almost unlimited, but they all have several things in common: They occur beyond our accustomed support systems, where such things as electricity, shelter, telephones, supermarkets, and doctors are taken for granted. For a while, the person in trouble must depend on three things: the clothing and equipment he has with him, his ability to use whatever survival knowledge he has learned, and his mental attitude—the confidence he has in himself, plus his desire to survive, no matter how difficult the circumstances may become.

In most cases, a survival situation will last a relatively short time. If a wilderness traveler has filed an accurate travel plan (see page 4) and becomes lost or injured, rescue will usually happen within 24 to 48 hours after it becomes known he is missing. But there are exceptions, when several days or even weeks may pass before rescue. A Scout well trained in survival techniques can survive a surprisingly long time if it becomes necessary.

Basically, wilderness survival means knowing how to stay alive until the emergency is over. It means working with nature rather than against it. It means always having with you an item that can't be carried in pack or pocket—a *positive mental attitude.*

You would think that everyone would have an equal desire to survive-but it isn't so. Some persons will survive under almost unbelievable conditions while others, in much less difficulty, will simply give up and quit.

Your self-confidence, the knowledge that you *can* and *will* survive, no matter how tough it gets, will see you through. If you are with others, your example will give them courage and determination to live through the ordeal.

Knowledge about survival techniques, such as you are learning now, is a key to your own positive mental attitude. Learn the right things to do at the right time, then practice these activities until you know them by heart, and you will build your confidence in dealing with wilderness emergencies

SurvivalPriorities

Knowing priorities in an emergency lets you start to work immediately and without confusion. Below are listed the logical steps you should take. Later, each item will be studied in detail.

1. **Positive Mental Attitude.** As attested by those who have survived wilderness emergencies, a positive mental attitude may be the most essential element in survival.
2. **First Aid.** If an injury is life threatening, such as rapid loss of blood, first aid becomes the most important thing to do.
3. **Shelter.** Extreme weather conditions, too hot or too cold, make finding or building a shelter of top importance. At such times even painful but minor injuries must wait until shelter is available. This is even more urgent if night is approaching.
4. **Fire.** Often, along with shelter, you will need a fire for warmth and signaling. Fuel should be secured and the fire started before dark.
5. **Signaling.** When you have taken the first steps in dealing with the emergency, you will need to prepare rescue signals.
6. **Water.** Under all circumstances, water is essential. You can live only a few days without it. Finding water is even more urgent when the weather is hot and dry.
7. **Food.** A person can live several weeks without food; it does not rate high as a survival priority.

Preparing for the Wilderness Adventure

There are several basic items that always should be carried in your emergency kit, even though the trip may be only a short hike from the road to the lake:

Instant Body Shelter

If a sudden storm dumps rain or snow, you need to protect yourself from the dampness and cold immediately. Even in summer unexpected storms happen, especially in mountainous areas. A big heavy-duty plastic bag, the 7-bushel size, is one of the best instant shelters you can have. It takes up little space and weighs only a few ounces. When a storm breaks, get out of the wind, make a hole in the bag just large enough to get your face through, squat down and pull the bag completely down over you.

A plastic tube tent is another good instant shelter. Aluminum-coated emergency blankets or suits are available. Just be sure your head is covered, and there are no gaps to allow your body heat to escape. The combination of an emergency blanket and a plastic bag over it will protect the wearer from severe weather. Later, when conditions improve, more permanent shelter can be found or made.

Fire-Starting Materials

There are a number of choices of fire-starting materials. Waterproof, strike-anywhere matches; a butane lighter; a metal match and 0000 steel wool; flint and steel; a bow drill; a candle; chemical heat tabs; or small pieces of pitchy wood are helpful. An excellent combination for your basic kit would be a butane lighter and several heat tabs. Put them in a can such as small bandage strips are sold in, seal the lid with adhesive or electrical tape, and you have a fast, efficient fire starter system, even in damp weather.

Signaling Devices

Your fire is a signaling device. Others include a whistle, flares, distress flags, a mirror, flashlight, and dye markers for boating emergencies. At least, your basic kit should contain a whistle and mirror. For overnight trips you will have a flashlight in your camping equipment.

First Aid Kit

You can buy a small first aid kit, or working with your counselor, put together one of your own. In either case, know what each item is for and how to use it.

Carefully assembled, your emergency kit will be surprisingly compact and lightweight. It should be small enough to carry in your jacket pocket. For simple day hikes, a day hiker backpack is ideal. You can stow your emergency kit in it, and carry food and other items as well.

Selection of Outdoor Clothing

Wearing the right clothing for the weather and the activity is more important than many people realize. When a wilderness emergency arises, how you are dressed can be a deciding factor in survival.

Dressing for Hot Weather

Lightweight clothing that lets body heat out while slowing down the evaporation of moisture is the best kind for hot-weather travel. A light color is best, as it reflects heat away from the body. This is why the light cotton khaki fabric has been popular down through the years. Cotton cloth holds sweat for a while before it evaporates. This retention of body moisture for as long as possible helps prevent dehydration and heat exhaustion.

Choose fairly loose-fitting clothing that fully covers you—and that means long-sleeve shirts and full trousers. You will stay cooler, and you will also avoid the danger of severe sunburn.

Always wear a lightweight hat or cap when traveling in hot weather. Protecting the head from excessive heat will reduce the chances of heat stroke.

Hikers in the summertime, while wearing lightweight clothing, should not forget that temperatures can drop rapidly after the sun goes down, especially in the desert. It makes sense to carry a jacket in your pack if there is a chance you will be out after sundown.

Dressing for Cold Weather

During cold weather, wear clothes that hold in body heat, while allowing body moisture to escape. If you have ever worn a waterproof slicker while hiking, you know how you can quickly become soaked with sweat. Then, when you rest, the sweat becomes cold and clammy and you begin to lose body heat. Under cold weather conditions, this can become serious.

Wool clothing generally has been considered the best for cold and wet conditions. It does what we need it to do; it lets our body moisture escape, while keeping our body heat in. Even when wet, wool does a better job keeping you warm than cotton.

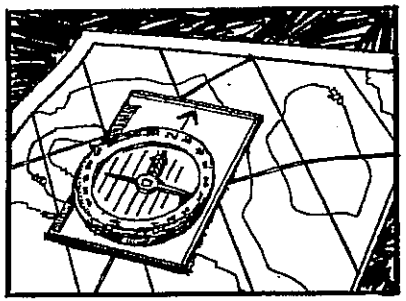
Layers of clothing usually are preferred for cold-weather activities. Several thinner garments insulate the body better than one bulky coat, trapping dead air between the layers. An advantage of layering is that you can remove a layer if the weather warms and you become too hot. A set of fishnet-type long Johns, a wool shirt, a wool sweater, and a medium-weight wool jacket is effective layering for cold weather.

Even the best wool clothing alone will not protect you for long if the weather is wet, windy, and cold. A wind-resistant, water-repellent jacket has to be worn over the other clothing. On the market today are several kinds of rain gear that actually breathe, allowing perspiration to evaporate while still keeping the rain out. Jackets, pants, gloves, and headgear are made from this material. While fairly expensive, it is much better than old-fashioned slickers and plastic raincoats.

You can wear the best clothing money can buy, but if you don't have good head covering you could be in trouble. In cold weather, a great deal of body heat can be lost through the head, so always wear a hat, cap, or other head covering appropriate to the weather and the activity.

While wool has been mentioned as the standard for cold-weather clothing, newly introduced garments of bunting and pile are available. Some outdoorsmen think these may be even better than wool. Before buying outdoor clothing, plan your selections carefully with the help of an experienced outdoorsman.

Finding Your Way



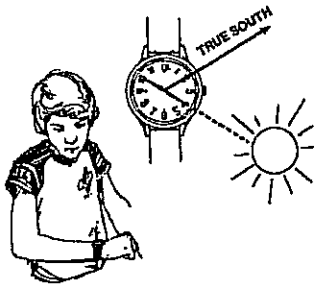
Every Boy Scout, indeed every outdoorsman, should know how to use a compass and read maps. A topographic map should be studied before hiking into an unfamiliar area and referred to often during the hike. Publications on outdoor navigation, or orienteering, are available, and your counselor can tell you about special courses. Orienteering field trips are real adventures. Not only are they fun, but they greatly increase the Boy Scout's confidence in his ability to find his way in the back-country.

If you lose or break your compass, you can still determine direction with your watch—provided you can see the sun. Point the hour (small) hand at the sun. Halfway between the hour hand and 12 o'clock, an imaginary line would point south.

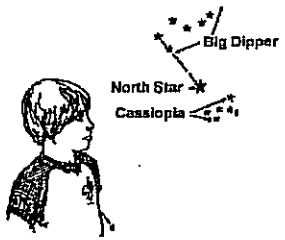
The next clear night, search out the North Star. It and other stars and star systems can be used to find direction and help you travel in a relatively straight line. The trouble with using the sun in the daytime and the stars at night is that clear weather is required. In foul weather it is better to seek shelter and to stay put until conditions improve.

Determining direction certainly can be helpful, but simply moving in a straight line is not always possible or desirable. The straight line might lead over an impassable gorge or an unclimbable cliff. With a compass and topographic map, you would find your best route around obstructions, while knowing at all times where you are.

Later, we'll talk about what to do if you become lost. We will tell you the reasons why it is most often wiser to stay in one place and wait for rescue than it is to try to hike out, even if you can determine direction.



Finding south with a watch



Finding north by the stars

First Aid in the Wilderness

The purpose of first aid is to keep the injured person alive and in as good condition as possible until professional medical help can take over. A Boy Scout who is good at first aid does not try to be a doctor and do too much; he simply does the right things quickly and efficiently.

All Scouts should study first aid thoroughly. Below are a few procedures that everyone going afield should know about. In fact, the outdoor person who knows this basic information can apply it at home, at school, at work—any time it is needed.

Severe Bleeding

Remove clothing around the injury so that you can see and work on the wound. Be fast, but be careful. The first thing you must do is stop the blood flow. Press your hand hard on the wound to hold the blood in while you get bandaging material.

If available, a large compress bandage from your first aid kit is best, but if it is not use the cleanest material available, such as a handkerchief, torn clothing, cloth of any kind. Your only purpose at this moment is to keep the blood in the victim's body.

While you are doing this, do not move the victim. If needed, add more compress bandages over the first one. If there are no broken bones, elevate the wound.

If the bleeding is from an arm or leg, press your hand firmly against the pressure point to slow blood flow. Then add even more bandages.

Once you are sure bleeding is under control, treat for shock. After you have done all you can, get professional medical help as soon as possible.

Minor Bleeding

Since small wounds with relatively little blood loss are not life threatening, you can take time to clean the wound with soap and water or water alone, and remove surface matter if you can do it without making the injury worse. Stop the bleeding with a compress or cloth to stop bleeding, then when the bleeding has stopped, bandage over the compress to keep it in place.

Other Notes on Bleeding

If injury is caused by an object sticking into the flesh, such as a large wood splinter, do not pull it out. This might cause an even more serious injury. Get the victim to medical help.

Any wounds caused by animals, whether wild or tame, require prompt medical attention. There is danger from infection, as well as the possibility of rabies. Be sure to wash the wound thoroughly.

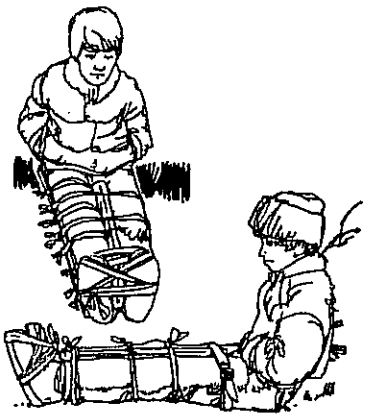
Puncture wounds could cause tetanus. Even a minor injury, like a nail through a shoe and into the sole of the foot, must be treated. Get the wound to bleed lightly, then wash clean. Cover with a bandage and get medical help as soon as possible.

Choking

Accidentally getting a piece of food stuck in the throat can be a terrible experience, as most everyone knows. It can be fatal. If a person is choking, but able to talk, or coughing, tell the person to try to cough it up himself. Keep encouraging the person. He will be all right. If, however, he is unable to speak, you must help. Bend victim over, head between the knees, and give him four vigorous blows between the shoulders with the heel of your hand. If this doesn't work, stand him erect and get around behind him. Reach around and place your clenched fist midway between the navel and rib cage. Place the other hand on top of the fist and thrust inward and upward against the abdomen four times. If unsuccessful, repeat over and over.

If the person becomes unconscious, turn him on his side, facing you. Give four sharp blows with the heel of your hand between the shoulder blades, over the spine. If the airway is still blocked, lay the person on his back. Face the person, kneeling beside or astride his hips. With one of your hands on top of the other, place the heel of the bottom hand on the abdomen slightly above the person's navel and below the rib cage. Press into the abdomen with four quick thrusts. Open the mouth with your thumb on the lower teeth and check for obstruction. Sweep the index finger inside the person's mouth to remove the foreign object. Take care not to force something further down the airway.

As the person is deprived of oxygen his muscles often relax. Continuing the back blows and manual abdominal thrusts may dislodge the object. Once the airway is reopened, check for breathing. If the person is not breathing, begin mouth-to-mouth breathing, and continue until the person revives, someone else relieves you, a physician pronounces the person dead, or you are absolutely too exhausted to continue.



BROKEN LEG: Place padding, coat, or blanket between legs; use belts or strips of cloth to bind legs firmly together. Make the patient as comfortable and free of pain as possible; treat for shock. Splint only if the patient must be moved. If unsure whether injury is a fracture or a sprain, treat as a fracture.

BROKEN ARM: Tie broken arm firmly to body using belts or strips of cloth. Make the patient as comfortable and free of pain as possible; treat for shock.

Shock

After any injury, shock can occur. This reaction to injury, pain, fear, or exhaustion can cause death depending upon the person and the circumstances.

A person in shock will be pale or even bluish, and the skin can be moist, cold, and clammy. Breathing may be rapid, becoming shallow and irregular. The pulse may also increase to more than 100 beats per minute. The victim may become weak. The eyes may be dull and unfocused. But do not wait for these symptoms to occur. After any injury, assume that shock will occur, and begin treatment immediately after treating life-threatening injuries.

Get the victim into the best shelter that is available. If the person cannot be moved, you will have to improvise a shelter using tarps, space blankets, or whatever you have at hand.

Make the person lie down. He may not want to do so, but you must take charge and firmly insist. Try to insulate the body from the ground with a sleeping bag, blankets, branches, grass, leaves, anything you can find. Provide the best comfort you can.

Raise the feet so that they are 8-10 inches higher than the head unless there are injuries that prevent it. If there are breathing problems, if the victim has chest or head injuries, do not raise the feet, but instead raise the head and shoulders slightly.

The injured person must be kept warm, but not covered so much as to become overheated.

In addition to physical care, a great need of a person in shock is reassurance. Speak soothingly, and as you do, try your best to appear calm and relaxed, even if the conditions are bad.

Now, treat any other injuries and relieve the pain where possible.

Hypothermia

Loss of core body heat resulting from exposure to cold temperatures, wind, water, or a combination of them, can cause hypothermia. Although proper selection of clothing, emergency shelters, and attention to the weather can minimize the chances of getting hypothermia, it can still happen.

Hypothermia symptoms include slurred speech, increasing clumsiness, and uncontrollable shivering. Often the person suffering from hypothermia won't know that he has it. For this reason, all in the party should keep close watch on each other when in cold, windy, and/or wet conditions. If you know a person is very cold, someone just taken from the water, for example, don't wait for symptoms but start rewarming immediately. In any case, here are the steps you should take if you suspect hypothermia:

Strip off wet clothing, dry the victim, and redress with dry clothing. If the victim can manage warm drinks, give him plenty of cocoa or soup.

Put the person in a sleeping bag, or wrap in blankets or coats, whatever you have.

Get the person out of the weather as soon as possible, into some kind of shelter. Your purpose now is to increase the body temperature of the victim until it returns to normal.

An effective way to rewarm a very cold person in a field situation is to remove your clothes and get into the sleeping bag with the victim. Chest-to-chest contact is the best.

How will you know when the person no longer has hypothermia? When he tells you so. When the shivering stops and the person looks, speaks, and acts normally, and his body temperature has returned to about 98.6° F.

Frostbite

In extremely cold weather, hands and feet and exposed parts of the face may become frostbitten. Fluids and soft tissue under the skin freeze. Proper cold-weather clothing will prevent frostbite except under extreme conditions.

Frostbitten skin will become yellow-gray or white. At the first signs, the skin must be rewarmed.

It is necessary to get out of the elements and into shelter to treat frostbite. If a hand is affected, it can often be rewarmed by holding it under an armpit or against the stomach. If warm water is available, it works well. The temperature should be warm, not over 105° F. When the skin thaws, it will appear flushed.

On the trail it is difficult to treat frostbite, especially of the feet. Do not take off your shoes and try to massage your feet. Rubbing frozen flesh can make things worse. Wiggling your toes inside your shoes or jumping in place can stimulate circulation to help warm your feet.

Heat Stress (Hyperthermia)

When conditions of extreme heat cause the body temperature to rise above 98.6° F, serious problems can occur:

Heat Stroke (Sunstroke)

This most often occurs after prolonged exertion in hot weather. Sweating, the body's way of keeping a normal temperature, slowly decreases and can eventually stop. When this happens, the body temperature can rise above 105° F and a heat stroke may happen soon. Heatstroke can be prevented by restricting activities when the day is hot, as well as by wearing proper clothing including headgear.

When sweating stops, the face will become flushed and reddish in color. Action must be taken quickly. The person must be moved out of the sun and into the shade immediately. Apply water, the cooler the better. You must get the body temperature down as soon as possible. Even then, the person should get medical help as soon as possible.

Dehydration

Caused by lack of water in the body, this can happen fast in hot weather. The first sign will usually be dark yellow urine. You should drink when thirsty. Restricting your intake of water can reduce your feeling of thirst. People have been found dead in the desert with water still in their canteens. Rationing water does not help get you through.

In hot conditions you should move slowly, so that exertion will not cause any more sweating than necessary. Keeping moisture in the body is the best way to avoid hot-weather problems.

Heat Exhaustion

Too much exertion in hot weather, even if the person has plenty of water, can cause weakness, nausea, and moist, clammy skin. The person's speech may not make sense. If you notice these symptoms beginning to occur, get the person to lie on his back, in the shade. The head should be level with or lower than the feet.

The patient may feel chilly, and should be covered. Give a solution of a teaspoon of salt to a quart of water. If he is suffering only from mild heat exhaustion, the patient will recover quickly in response to your first aid. If he does not respond rapidly, then you must get medical help as soon as you can.

Sunburn

Sunburn is classified as a first-degree burn, with the skin appearing reddish and inflamed. While rarely life threatening, the pain and discomfort can ruin an outing. In the spring, first exposure to the sun should not be longer than 15 minutes. Sun blockers in cream or ointment form can help. Experienced outdoorsmen seldom get sunburn. They wear clothing that covers arms and legs. Wide-brimmed hats protect the face and neck.

If you do get a sunburn, a burn lotion may help by keeping out air. Other than keeping the sunburned area covered, there is not much more you can do in the field.

Second-Degree Burn

This is a deeper burn with blisters. The burned area should be held in cold water or covered with snow as soon as possible. After around 30 minutes, the pain will usually be much less. Do not apply lotion. Instead, gently blot the area dry and cover with several layers of dressing.

Third-Degree Burn

This burn goes deeper than the surface and damages underlying tissue. There is actual charring of the skin and flesh. A person with such a severe burn needs medical help as soon as possible. About the best you can do is to cover the burn loosely with clean, dry bandaging material and then wrap with plastic to keep out the dirt. Do not use lotions or immerse the burn in cold water. You could cause more injury. A third-degree burn victim will probably go into shock if the burns are at all extensive.

Blisters

Blisters, like sunburn, won't kill you, but they certainly can make life miserable. If you are in a situation where you must continue hiking, the pain can be extreme. To prevent blisters from forming, stop at the first opportunity and examine the foot. Where you can see a pink area caused by the rubbing of the shoe, take a piece of moleskin from your first aid kit and cut it slightly larger than the hot spot. Cut out the center of the moleskin so that it is like a small doughnut. Tape it in place and with luck no blister will appear. If it does, and you must open it, disinfect a needle in flame, and pierce the wound near an edge. Press out the fluid gently. You now have a small wound that must be bandaged. Ideally, you won't have to hike much farther. A raw blister can become terribly sore and infected.

Snakebite

Not all snakes are poisonous, and not all poisonous snakes have venom. If you are bitten, assume the snake is poisonous. Stop moving. Excess activity will spread the poison faster. Lie down if you can. Keep the bitten area lower than the heart. Immobilize the limb. For example, if a leg is bitten, tie or strap it to the other leg. Use pieces of cloth, belts, whatever you have. If victim can be taken to a hospital within 5 hours, do no more.

If pain, nausea, and shortness of breath begin to occur, along with swelling and discoloration of the bite area, put a constricting band on the heart side of the wound. A belt works well, as long as it is from 3A to 1'/2 inches wide. Keep the band snug. If you can just slip a finger under it, it is tight enough. If swelling increases, be sure to loosen band, but do not remove it. Check for pulse on both sides of the band. You must not cut off circulation of blood entirely.

If you are the victim, try to keep calm. If someone else is the victim, reassure them. Snakebite is seldom fatal in North America.

Keep the patient warm and under shelter. If there are more than two in the party, send for help after first aid is applied. If alone, you may have to suffer it out. Trying to hike with your system full of venom could be deadly. Chances are good you will survive if you stay where you are and wait for help.

Insect Stings and Bites

No matter how much bug lotion you may apply, stings and bites from insects will happen. If you know you are going into a bad insect area, you can take along netting to cover your face and gloves for your hands. Needless to say, wear a long-sleeve shirt and pants. Five percent hydrocortisone cream will soothe the stings and bites of insects and will relieve the itch of poison oak and poison ivy as well. If you don't have any medications, try an old-fashioned remedy that really works—mud. Just dab some mud on the spot, and shortly the pain of the sting will start to fade.

Some people are allergic to bee stings, and to them a sting can become a deadly serious emergency. They must try to avoid bees and always carry medicines prescribed as antidotes when they are outdoors. People with these allergies should advise their companions and show them how to administer the medication.

Bees, and especially yellow jackets, can be a real nuisance in camp. Usually they will leave you alone if you ignore them. They are attracted by food, so make sure you burn scraps or seal them in a plastic bag to carry out later. If you are not in bear country, you could bury scraps-more about that later.

Ticks

While ordinary insects are more of an annoyance than anything else, ticks can cause illness. After hiking in country known to have ticks, examine yourself carefully all over. A tick can crawl inside your clothing quite a distance before digging in. And, as he buries his head in your flesh, he injects an anesthetic so that you feel no pain. A day or so later, you may find a tick embedded under your anklebone or some other hard-to-see place.

It is possible to remove a tick by gently pulling, but all too often you will have the tick's body between your fingers and the head will still be in you. This can cause a bad sore and leave a permanent scar. Instead of pulling, try applying vegetable oil or petroleum oil over the area. Margarine also will work, and even thick, soapy water can be used. This cuts off the tick's oxygen supply, and may cause it to back off. If the tick is still in place after 20-30 minutes, remove it carefully with tweezers.

After the tick is removed, wash the wound area carefully with soap and water and apply an antiseptic solution.

If tick fever is prevalent where you hike, you must get medical attention soon if you are bitten. Always avoid touching a tick, as tick fever can be transmitted by finger contact.

Prescription Medications

If you have prescription medicine that you must take regularly, have a supply with you even on short trips. For example, you may require medication once a day, and you intend to be out for only a few hours. You expect to be home before dark, so you don't bother to take your medicine with you. What if something unforeseen keeps you away for a day? Several days? Always plan for the unexpected.

Hygiene

Personal cleanliness is not crucial in a short-term survival emergency. However, health problems such as intestinal sickness and infections can be prevented by taking normal precautions.

Intestinal sickness can be prevented by keeping the hands and body clean, by purifying drinking water, by sterilizing eating utensils, by avoiding excessive handling of food, and by keeping the fingers away from the mouth.

Infections are best prevented by immediately treating cuts, sores, and wounds and keeping them as clean as possible.

Dirty clothing can cause discomfort and irritate the body. Conditions permitting, clothing can be aired to remove moisture. If water is available, washing clothes will remove most of the dirt and perspiration.

Hygiene for personal comfort should only be considered after all other survival priorities have been met.

Shelter

Unless the climate is mild, day and night, one of the first requirements in a survival situation is shelter from the elements. If your pack contains a tent or tarp, all you need to do is find a suitable location. If you were traveling by vehicle, your car or truck offers protection. Even your canoe or boat can be propped up to make a shelter.

If you have none of the above, then you must either find a natural shelter or make a shelter from the materials at hand.

Natural Shelter

Caves are natural shelters, providing they are free of snakes or bears or other wildlife. Fallen trees, hollow trees, boulders—they all can be used. Natural shelter is especially important if darkness is falling and there is no time for shelter construction. Train your eyes to recognize instant natural shelters. You will be surprised at all that nature provides, if you look closely enough.

Making a Shelter

Before making a shelter, locate the right site for it. It should be relatively level but sloping enough and high enough to provide adequate drains. The site should not be exposed to wind or drifting sand or snow.

If you will be building your shelter from native materials, is there a good supply of them nearby? The closer they are, the less energy you will use procuring them. Is there a plentiful supply of firewood? Be careful to avoid dead snags or branches. Also evaluate any risk of rock falls, landslides, avalanches, or lightning.

A good site will be near water—one of your priorities for surviving, but not so near that you may be threatened by flash floods, insects, shifting river courses, or high tides. Visibility from the air should be considered for aircraft flying overhead to pinpoint your location.

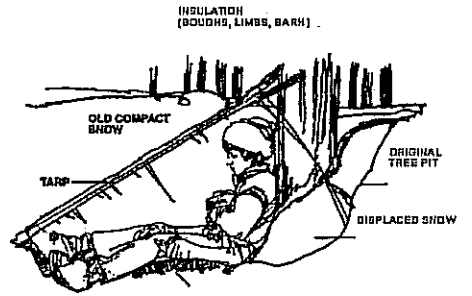
A fallen tree or log; a large rock outcrop or an exposed root base; thickly vegetated brush or small spruce, fir, or pine trees; a snapped off sapling or a lashed tripod can all be used to improvise a shelter. Always remember that a small shelter takes less work to build and less area to heat. *Build 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 most survival situations. You will probably only use it a night or two anyway.

If using a fallen tree, rock, or root base, first build a framework by propping up branches 1 to 3 inches in diameter against the leeward (downwind) side. The walls should form an angle of 60 degrees with the ground to shed rain. Point the tips of the boughs downward for the same reason. Then weave smaller boughs between the larger ones and work large pieces of bark and boughs into this framework. If you were fortunate enough to have had the foresight to bring along a rescue blanket or large sheet of plastic, lay it over the framework.

If you are faced with a real survival situation, by all means, use live boughs. 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 boughs to insulate your body from the ground as well.

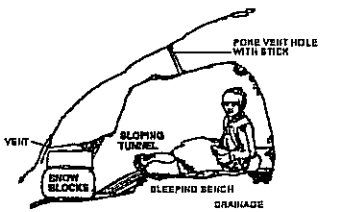
Thickly vegetated brush or small spruce trees can be bunched together and tied off at the top to fashion a fine shelter. By weaving other brush or boughs into any gaps, you can weatherproof your shelter to withstand even a wind-driven downpour.

A snapped-off sapling is an effective way to start building your shelter. Pull over a sapling so that it breaks 4 to 5 feet above ground, but don't break it off completely. Let the top remain hinged to the trunk with the tip resting on the ground. You may need a large rock to hold it down. Then prop branches 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.



If nothing else is available to start your framework, you may need to lash three poles together, two 4 feet long and one 8 feet long for the ridge. Finish it off with weaving and cover it with material and boughs as before.

Arctic-like regions require shelters that offer protection from the cold and the wind. Six different types are designed to serve different situations: a tree pit, snow pit, snow trench, snow cave, snow dome, and igloo. The first three are considerably easier to construct than the latter three. If possible, excavate the base of your winter shelter to bare mineral soil since the earth emits some warmth (about 18° F) even in winter.



Many other shelters can be built. Use your ingenuity to construct one that fulfills your needs.

In any shelter—natural or constructed—be sure and insulate yourself from the ground. This is necessary under either hot or cold conditions. Stack branches, grass, dry leaves, extra clothing, whatever you have and can find that insulates you from the ground.

Friendly Fires

Soon after shelter has been secured, the reassuring warmth of a fire will make you feel better emotionally as well as physically. Also, a fire is one of the best signaling devices you can use.

Fire Preparation

Even in an emergency, take time to select the right place for your fire and prepare the ground before building it. A fire site out of the wind and protected from rain and snow should be found. Don't make a fire under snow-laden branches. If you do, before long a miniature snow-slide from the tree will land right on your fire and you.

Your fire should be near your shelter. Scrape away the ground until you have removed all dry, burnable material so that your fire bed is on mineral earth.

Don't line your fire area with round stream-stones. They can heat up and explode like hand grenades.

Do not prepare a huge fire. One large enough to keep you warm without roasting you is the idea. Keep the fire friendly.

After your fire site is prepared, find and haul your night's supply of fuel so that you will have it handy before dark. Protect it from the weather. With your fuel on hand, gather the driest tinder you can find—dry twigs, bark, moss, leaves. You can make tinder by whittling shavings from a dry stick.

Even in wet weather, dry tinder can be found if you know where to look. Often, dead branches will be dry. Look under trees, logs, and boulders. Push over standing deadwood. Once down the deadwood will usually break easily, and dry wood can be found in the center.

Rotten stumps and logs are sources of tinder. You may even be lucky and find some pitchy wood. Finding materials for fire making is a great field exercise, and you will be surprised how ingenious you can be at finding dry materials even on the soggiest winter day.

Before starting your fire, you will have three stacks nearby. One will be tinder to start the fire and get the kindling burning. The second pile will be kindling, small branches, and larger twigs. The kindling will create the fire to burn the larger branches and logs. This larger material makes up your third pile.

Fire Starting

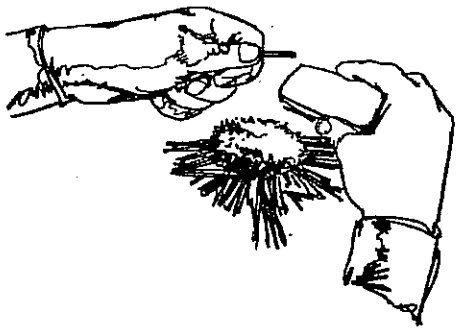
Ignite a small amount of tinder, using one of the methods described below. As soon as the tinder bursts into flames, add more tinder to increase the flames. Do not add too much too soon or you will smother the fire. Add smaller pieces of kindling as the fire takes hold and grows. Keep adding kindling until your fire is big enough to burn larger fuel. As the fire grows, add fuel in a teepee shape, allowing plenty of air circulation to keep the fire going. Remember, the fire must have air. If necessary, blow on the base of the flame to increase its heat.

After the fire is safely ablaze, add larger pieces of fuel. Place them like the spokes of a wheel with the fire as a hub. As the wood is burned, push the fuel into the center. What you have is a friendly, controlled fire for warmth and for cooking.

Fire-Igniting Techniques

There are a number of ways to get that first tiny flame that you will build into a fire. Plan ahead so that you have the right materials in your emergency kit.

Lighters



One of the most efficient fire igniters is a butane lighter. It will provide a hot flame long enough to start even slightly damp tinder.

Metal Match

Used with 0000 steel wool, the metal match is an efficient fire igniter. Take a small amount of steel wool and put tinder over it. Strike sparks with the metal match into the steel wool, gently blowing the sparks into the tinder.

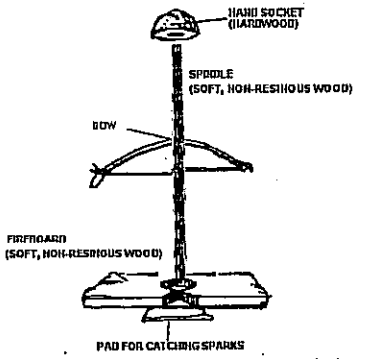
Matches

Before butane lighters came into use, large kitchen matches, waterproofed with wax, were standard equipment, and many people still use them. They must be kept in a moisture-proof container.

Flint and Steel

The flint and steel method of fire starting works well if the tinder is very dry and if the weather is dry. You can buy a flint and steel kit, along with instructions for its use.

Bow Drill



An ancient but still useful method of igniting tinder is the bow drill. It will work well if conditions are dry, if you have the right materials for making it, and if you have the time and patience to use it. You can purchase a ready-made bow drill, and we recommend that this might be the best way to learn what this method of fire starting is all about.

Optical

Concentration of the sun's rays through a magnifying lens onto dry tinder can start flame. To experiment, use a reading glass magnifier. Concentrate the sunlight so that a small, bright spot appears on a piece of paper. Hold the lens steady, and, if the sun is bright, you will soon see the paper begin to scorch and burn. Now, knowing that this can start a flame, try other magnifying lenses, such as flashlight lenses, eyeglasses, a camera lens, a rifle sight, whatever you think might work. While you may never need to use this method, it is always good to know. .. just in case.

Chemical Fire Starters

On the market today are a number of different materials that will catch fire easily and burn with intense heat. Some are in the form of tablets, others are string-like, some can be molded between your fingers like putty. Just a touch of flame and they will burn long enough to get your fire started. CAUTION: Don't just buy these kinds of fire starters and put them in your emergency kit and forget about them. Try them first, after reading the instructions. The first time to try anything is before an emergency happens.

Candle

An old but still fine fire starter is a candle. It lights easily and will burn long enough to start your tinder. Waterproofed matches and a short piece of candle, sealed in a waterproof container, is a combination to be found in the packs of many experienced outdoorsmen.

Since starting a fire, especially under wet conditions, is one of your most important survival skills, practice a variety of methods so that you can build a fire anywhere in the wilds, regardless of the weather

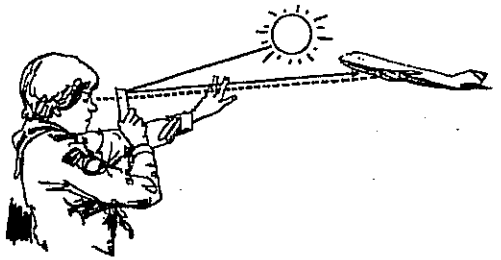
Signaling for Rescue

In an outdoor emergency where rescue is necessary, you must do all you can to attract attention. A fire is certainly one of the best signaling methods. Adding green material such as leaves will make smoke which can be seen for miles on a clear day. In summer, when fire lookouts are on duty, the slightest bit of smoke will be seen and investigated.

The flame itself will attract attention, especially on overcast days and at night. Unless the fire is on high ground, however, it will be visible only to airplanes that fly directly overhead.

If you have sunshine, a signal mirror can attract attention for miles, but it must be used properly. You have to aim it, and this takes practice. Study the illustration, then with a buddy go out and practice until you know what you can and cannot do with a mirror.

Contrasting colors and motion tends to attract attention. A bright piece of cloth tied on a stick and waved can be noticed for quite a distance. If the background is dark, such as a green forest, something white can easily be seen, especially from the air. Any geometric shape in a field will attract attention.



Since air rescue can be vitally important, ground-to-air signals need to be part of your survival knowledge.

Below are shown the ground-to-air emergency signals you should know. They must be as big as you can make them. Since you will have to use whatever materials are available, you will need to use your ingenuity to construct symbols that can easily be seen from the air. Green branches on white snow is one example. You can also tramp out symbols in snow; the shadows in the depressions will be seen from above. Stones can be used. Strips of cloth, bits of wreckage, any way you can improvise a signal should be used. While it is important to know all the code symbols, if you can make only one, use the X—as big as possible.

Sounds can help searchers on foot. Three of anything—three whistle blasts, three gunshots, three bangs of a rock against a tin pan, all are distress signals. Repeat them at intervals.

Whistle blasts carry a long way and every outdoor person should have a powerful whistle. It is much better than your voice alone. Yelling can only be heard a short distance. It takes considerable energy to keep yelling, and yelling can sometimes increase feelings of panic. Keep your shouting to a minimum. Cry out only if you have reason to believe searchers are nearby and can hear you.

Ground-to-Air Visual Signal Code

Require assistance	V
Require medical assistance	X
No or negative	N
Yes or affirmative	Y
Proceeding in this direction	t

Water

You must have water to live—simple, but true. In very hot weather, you would survive only a few days without water. Even in cool weather, you could not live long without water.

Be ready to take advantage of rainstorms. You can quickly gouge out a hole in the ground and line it with plastic to catch rainwater. Hollow tree stumps may contain water. Hollow places in boulders will hold water after a storm.

When you need water, get it wherever you can—don't be finicky. You can strain water from mud using your handkerchief or undershirt. You can squeeze the center pulp from some kinds of cactus plants.

Even though it will not be tasty, you can mop dew from leaves and rocks with cloth and wring out the moisture into your mouth.

In a survival situation where water is limited, you will want to reduce your activity to prevent perspiring. For this reason, searching aimlessly for water can do more harm than good. Search out only the likely places nearby, such as green vegetation areas at the bottoms of canyons. Most game trails will eventually lead to water, but it could be many miles away.

If you find a stream or a pond, purify the water before drinking, if you can. Boiling water for 10 minutes will kill most bacteria. Add 5 drops of iodine to 1 quart of water, or use commercially available water purification materials.

What if you have found water, have no way of purifying it, and are suffering from extreme thirst? Go ahead and drink. Better to suffer and survive an intestinal disorder than to die of dehydration.

Finally, about water: Do not try to ration it. Drink when thirsty. When your water is gone, the best you can do is to continue to stay in the shade, move as little as possible, and wait for searchers to see the emergency signals you have laid out.

Food

In most survival situations, food is not an essential. While you can only live a few days without water, you can live for weeks without food. The energy required to find food often will burn more calories than will be provided by what you can scrounge. However, if you have plenty of water, are not sick or injured, and have an adequate base camp set up, you can spend a little time looking for food, just to prevent boredom.

A stream may provide crayfish. Look under rocks in shallow water and be prepared to grab fast. If your emergency kit contains a hook and line, bait up with worms, grubs, beetles, whatever you find, and try fishing. If this doesn't work and you think you are starving, you can always eat the worms, grubs, grasshoppers, or whatever.

If you have a pack full of food but no water, don't eat the food. Eating will just make your body need water more.

While there are many kinds of edible plants growing wild, there are also some poisonous ones. The safest way to learn to identify edible plants is have an expert teach you firsthand in the field.

You can read about animal snares and traps in many survival publications. It does, however, require lots of experience to successfully capture wild creatures. As we've stated, food is not essential to most survival situations, and the energy spent finding it is often greater than the food value gained.

Lost

People react in different ways upon finding themselves lost. Those who are cool and collected and follow a few basic rules usually survive to tell tall tales about the experience. Those who panic—and this happens all too often—are the ones that may not live to become older and wiser.

Panic generally results from fear of the unknown, from lack of confidence, and from not knowing what to do next. What you are learning as you work for your Wilderness Survival merit badge will give you the confidence and ability to handle the situation well, even if you should become lost.

When you first realize you are lost or confused, STOP. Do not give in to the inclination to keep moving for 30 or 10 or even 2 minutes longer. Stop immediately.

The letters of STOP have a special significance for survival situations. They mean: ***Stop Think Observe Plan***

Stop, before you do anything. Take off your pack and find a dry place to sit. Relax. If you've been flustered, it may take 30 minutes or more to regain your composure. Looking at the beauty of nature around you may help.

Think. Study your map if you have one. Try to determine where you are now. If the map alone does not help, look around for prominent land features. Can you identify any of them? Note the contours of hills, ridges, or mountains. Attempt to locate these same contours by carefully studying your map.

If you don't have a map, think about where you could have gone wrong. What was the last point of reference you positively identified? In what general direction did you travel from there? If you were following a road or trail, or if snow covers the ground, can you retrace your tracks?

Do not make hasty judgments. If you cannot determine your way out, build a fire. A fire provides security and warmth and is conducive to clear thinking. If it's late in the day, plan to spend the night.

Observe. What do you have in your pack or pockets or on your person that may help you? What is the weather like? What natural resources are available? Where is a good place to make camp?

Plan a course of action. After considering all aspects of your predicament, adopt a plan that will best utilize your limited reservoir of energy. If you become absolutely sure you are lost or it becomes dark, stay where you are. You should move only to reach a safer or more sheltered position. Put into practice the survival steps you have learned, and wait as calmly as you can for help to arrive.

Since you left a detailed trip plan with some responsible person before going into the wilds, your failure to return on time will trigger a search effort that will likely find you within 24 hours after the alarm is sounded. You could, if you had to, survive much, much longer.

Danger From Wildlife

It is rare that you will ever encounter problems from creatures met on your wilderness adventures. Most wild animals are more afraid of you than you are of them.

Snakes

In the section of first aid, we told you how to treat snakebite. Better yet, don't get bitten. When in snake country, watch where you place your feet. When going through vegetation swish a stick ahead of you to alert snakes that you are coming through. Unless you step on or are very near one, most snakes will usually do their best to keep away from you. The exception is when snakes are shedding their skins; they will strike blindly at whatever gets close to them.

In really bad snake country, in addition to high boots, special leggings or "snake chaps" are worn. If you are protected to slightly above the knees you are fairly safe.

A real danger in snake country is while climbing up over rocks. Be extremely careful. To reach up for a handhold and get a handful of snake instead can be shocking to the snake and to you.

Surprisingly few people are bitten by snakes, even where there are large numbers of them. Give snakes half a chance, and usually they will stay out of your way

Bears

Except for those found in public campgrounds, most bears are afraid of people and you will seldom see them. So-called tame bears that live around campgrounds and are not afraid of people can be risky. Grizzly bears, wherever they are, are dangerous and must be avoided. A mother bear of any species who has cubs with her can be dangerous. Leave cubs absolutely alone. In fact, if you encounter a mother and cubs, go out of your way to stay clear of them. Move away slowly; don't run.

Bears love to eat the same food you eat—from candy bars to beef stew. Even a shy bear will be tempted to break into your camp and gobble up all the available goodies. So, never take food into your tent with you. Don't leave food where bears can find it. Bears love toothpaste and other toilet articles, and even some of the things in your first aid kit. Take your pack of food and toilet and first aid kits at least 200 feet from your camp. Toss a rope over a limb, tie the rope to the pack, and hoist it 15 feet high, beyond the reach of hungry bears.

Unless you startle them, present a danger to their young, or have food they want, wild animals usually will avoid you. If you need information and reassurance, you can always check with a forest ranger before entering a wilderness area.

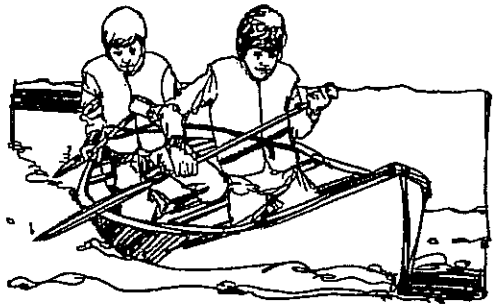
Other Survival Situations

Whether it's hiking, motoring, boating, snowmobiling, flying—whatever you do that takes you into or over remote areas—always have your emergency kit with you, as described earlier. None of the first aid and survival items you've carefully put together are any good unless you have them with you.

Boating

Always wear an approved personal flotation vest or jacket, even for short boat rides. If your boat capsizes, you should stay with it unless land is extremely close. Sometimes small boats can be righted, but

unless you are sure you can right the boat and climb in, don't waste your energy. If the boat is upside down, perhaps you can climb on, getting yourself out of the cold water.



If you must stay in the water, your chances of survival are greater if you assume the HELP or huddle positions, as illustrated.

Heat escape lessening posture (HELP)

Huddle together with sides touching.

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

One of the most common causes of small boat accidents is overloading. Be sure you know what your boat can safely hold and never exceed the limit.

Boat Loading

To determine the weight capacity of a boat, multiply the length of the boat by the width (beam), then multiply by 10 (L x W x 10). Example: A 16- by 5-foot boat, using the above formula, can carry 800 pounds. If the motor, gas, and other equipment weigh 200 pounds, the remaining capacity for passengers and cargo is 600 pounds. These limits are calculations based on fair weather and calm seas. Under poor or deteriorating conditions, the weight should be reduced or the trip canceled.

Swim downstream feet first.

Loads should be evenly distributed to keep the vessel on an even keel. Properly loaded, steering is easier, as is the boat's ability to handle rough water. Items should be stowed to prevent shifting while underway. Redistribution of people and cargo may be necessary to maintain trim.

Stay with your boat unless very close to shore.

Care should be taken when loading to keep emergency gear accessible. Personal flotation devices, tools, sea anchor, first aid kit, ropes, and fire extinguisher must be readily available, not buried under other cargo.

Since conditions or weather, water, and types of boating vary from place to place, always try to find reliable advice when you are in an unfamiliar place.

Climb on top of a capsized boat if possible.

Motoring, Road or Off-road Vehicles

When planning a trip that may take you off the beaten track, carry along extra clothes for all in the vehicle. Be prepared for the worst weather that could occur during your trip.

Should your vehicle break down, stay with it. If the battery is okay, you can blink the lights after dark to attract help. Remember, 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. Don't continually blast on the horn or shine the lights—the battery will soon be dead.

Hike out only if a main roadway is nearby and there is no doubt that you can reach it. Another circumstance that might require hiking out is if someone is sick or severely injured and must have medical help soon. Only you can be the judge of what you should do; but based upon the survival skills you have learned, your decision will very likely be the right one.

Flying

Before a flight in a private aircraft, all passengers should pack extra clothes, just in case. It may be warm and sunny when you take off, but

if your plane should crash high up in the mountains, survivors might well be in rain or snow.

Since almost every plane crash results in injuries, adequate first aid kits should always be carried.

Survivors of a wrecked plane should stay as close to the wreckage as possible. Basic survival procedures—first aid, shelter, and signaling-should be used. Since your pilot has filed a flight plan, you can be sure search planes will be in the air soon after you fail to land on schedule.

Floods, Cyclones, Earthquakes

There is nothing we can do to prevent natural disasters, but after they happen we can do a lot to keep ourselves alive and help others around us. When electricity, telephones, and transportation are cut off, we are in a survival situation just as serious as though we were in the backwoods. Scouts with survival training can be important people during unexpected community emergencies, adopting their knowledge and experience to meet whatever challenges the circumstances demand.