

Winter Survival Seminar

December 11 & 12, 2010

Cummings Cabin



Introduction to Winter Survival

By David Cronenwett

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Workshop sponsored by:
Montana Discovery Foundation
Helena National Forest
Helena Outdoor Club
The Base Camp
Lewis & Clark County Sheriff
Carroll Adventure & Mountaineering Program

December 11 & 12, 2010

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About Your Instructor:

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Defining Survival Situations:

A survival situation, as opposed to simply being lost in the woods, is defined as an episode that can kill you if immediate, corrective action is not taken. Being lost or mildly injured *could* develop into a full-blown survival scenario if panic is not controlled. Most people who perish in the wilderness do so from panic induced exhaustion which leads to hypothermia. You may be shocked to know that most of these deaths occur inside a mere 36 hours. On the positive side, in the continental United States, the majority of survivors are rescued within 72 hours. Therefore, your objective is simplified to keep your mind calm and your body well hydrated and kept near 98.6 degrees while awaiting rescue.

You will likely only be rescued if you have left your itinerary with a trusted person including instructions about what to do if you are overdue. A search and rescue operation can be expensive and poses risks to all involved. You therefore owe it to yourself and others to be prepared and avoid being the object of a search if at all possible. On the other hand, if no one knows where you are, you may have no choice but to walk out.

Because winter can be such an unforgiving season in the mountains, your survival skills must be honed through regular practice *during* winter and in environments similar to those you regularly travel in. The most important skill for winter survival, aside from recognizing potential dangers before they develop, is the ability to dress well. The importance of clothing in survival situations has been proven again and again. Next, you must remain calm, assess your situation and act accordingly. If this means preparing shelter and an adequately large fire to get yourself through the night, then you need to get busy.

Problems of Winter and the Physics of Heat Loss:

The obvious problems that winter poses to recreationists are hypothermia, frostnip and frostbite. Hypothermia is the insidious and potentially deadly lowering of the body's core temperature. Ironically, hypothermia is less likely to be a problem in winter because most people dress warmly enough to expect it. It is more of an issue during the other three seasons.

Still, a high-stress survival scenario where you may need to live through a night or two of subzero temperatures without a sleeping bag, could easily push your body into a precariously cold state. Time is not on your side in deep-cold survival. The body loses heat via convection (wind action drawing heat away), conduction (direct contact with a cold object), radiation (an uninsulated body in a cold environment) and evaporation (moist skin conducts heat away from the body about 30 times faster than dry skin). A simple test for the early signs of hypothermic incapacity is to touch the thumb to the little finger. If there is any difficulty whatsoever, you must either exercise vigorously or immediately light a fire, the latter being more desirable. If you are alone, you may quickly become unable to revive yourself beyond this point of early-stage hypothermia.

Frostnip is relatively easy to detect on exposed skin, which will develop a white and waxy appearance. Treatment should include immediate warming of the affected area by direct contact with another warm body, like a warm belly or armpit. A fire will quickly cure a case of frost nip. There is usually no permanent damage associated with this condition.

Frostbite is another matter entirely. The early stages of frostbite should be treated in the same manner as the less serious frostnip. In a true winter survival situation (outside of extremely remote locations) it is probably best to **not** reheat a severely frostbitten appendage. Treatment for such injuries are complex and should be handled in a hospital. Frostbite is best avoided and fairly easy to do by attentive woods travelers with competent fire skills. Supposedly, the Swedish Army considers frostbite a court-martial offense.

Any of the cold related maladies of winter can make firemaking difficult or impossible. Be sure to read the Jack London classic, *To Build A Fire*, then try this simple experiment: with a fire already going, take off your gloves and allow your hands to become thoroughly numb. Next, try to make a substantial fire inside of five to ten minutes. If you succeed, consider yourself lucky. If you fail or give up, run back to your other fire and remind yourself to **never** let your hands deteriorate to such a state!

The other serious but often overlooked winter related problems are snow blindness and dehydration. Snow blindness is easily avoided by wearing adequate sunglasses. A backup pair should be a component of all winter survival kits. If you lose your eye protection, you must fashion primitive “slit” shades out of bark, wood, cloth or whatever is available.

Dehydration is a common and debilitating condition to the winter recreationist. All bodily functions, including the thermoregulation system, rely on adequate water reserves. You will become much colder if you do not drink enough water to always urinate clear liquid. You may also develop gnawing headaches, digestion problems and become lethargic. None of these symptoms are conducive to making it through a winter survival situation. The body’s thirst mechanism should not be used to gauge your hydration. It is best to drink hot tea or water throughout the day, which is why a pot of some kind is an absolutely integral part of the winter survival kit.

Avalanche behavior and the conditions that can lead to them should be studied thoroughly by people who recreate or travel in high mountain environments. If you wish to know more, get on the internet (try the Gallatin NF Avalanche site www.mtavalanche.com) and find a reputable instructor or institute since this is not our area of expertise.

Clothing:

The importance of clothing in survival scenarios and indeed, for all outdoor pursuits, must never be underestimated. Clothes insulate us from cold and protect us from rain, snow and abrasion. People who otherwise would have perished in the wilderness have been known to squeak by because they were adequately dressed. In winter conditions especially, **you must wear or carry enough clothing for the worst conditions to be expected.**

The layering system, one that emphasizes several thin layers over fewer heavy ones, is well known by most people. However, in the past twenty years or so, polypropylene fleece and other synthetic fabrics have supplanted the traditional choice of wool clothing. It is my feeling that many of these newer products are not withstanding the test of time. Recently however, more people are rediscovering the amazing qualities of wool and more companies are manufacturing excellent, high-performance products.

First, wool is a natural, renewable fiber that can be sustainably produced and will eventually biodegrade. Compare this to the petroleum intensive nature of fleece products that will last for centuries in the landfill. In my opinion, most synthetic outdoor garments are vastly inferior to their traditional wool or cotton counterparts. When working and living around open fires and woodstoves, having a wardrobe of plastic clothes can be dangerous. I have seen expensive parkas and fleece pullovers riddled with “spark holes”, and witnessed the gruesome melting and outright combustion of gloves, hats, pants and other items made of similar materials.

It seems that most modern backpacking gear, including clothing is designed without long-term repair or maintenance in mind. Wool and canvas are much less flammable and are easier to repair when damaged. Wool lacks the disturbing quality of some synthetics to hold on to body odor forever, no matter how many times you launder them. Companies like Ibex and Smartwool have a line of excellent, durable and non-itchy garments for a wide range of outdoor pursuits including mountaineering and backpacking. In my experience, wool clothing also allows for a greater comfort range; this means that you will not rapidly overheat like you would in synthetic clothing.

Having said all this, we recognize that many people use synthetic clothing and there is a place for it. We would only like to recommend that individuals who spend a lot of time in the wilderness to give wool clothing a try, you may be surprised by the results.

It is often repeated in the outdoor literature that “cotton kills”. That is, when it becomes wet cotton loses most of its insulation value. In this instance, it is true. However there are some exceptions to the rule. First, waxed cotton, sometimes called “oilcloth” or “oilskin” has been used for generations to shed rain. When worn with a good wool layer beneath, it is an excellent combination for wet weather. There are also instances when cotton cannot become saturated, as is the case when the ambient temperature hits 20 degrees or below. This “dry cold” is when canvas outerwear really comes into its own, because it blocks wind and truly breathes to let perspiration escape. Native people in the far north realized this early on and used canvas to make windproof anoraks, uppers for their winter footwear and in other instances when brain tanned moose hides were unavailable or needed to be conserved.

The so-called waterproof-breathable fabrics that comprise the bulk of raingear today will never live up to its own advertising. Hard, sustained use in the wilderness, as opposed to weekend outings will destroy these products in short order. Though they may technically breathe in a laboratory setting, they cannot do enough of it in real-world conditions to prevent moisture buildup (from perspiration) and eventual saturation of your inner layers, especially when you are working strenuously. A good wool coat may keep you as dry—or more so—than a Gore-tex parka. In any case *all* clothing in winter will build up frost within their fibers, which will greatly reduce insulation value. This can be a serious problem in periods of extended cold. The ability to remove this moisture is essential and the only realistic way to achieve it is with a warming fire.

Tool Use:

Knowing how to use cutting tools in the wilderness is an important skill set. Most backpackers have little experience with the proper use and maintenance of an axe, knife or saw. In winter, these tools can prove invaluable for survival. In all seasons, they may significantly contribute to comfort and enjoyment as well. It is imperative that you understand correct and safe use of these tools, since any of them may end up being the *cause* of a survival situation or make a marginal situation worse. It is equally important to exercise good judgment and ethics when using steel tools in the woods.

The knife is the smallest and most continuously used tool. Tasks like fire lighting, wood gathering, natural crafting, shelter building and many others are greatly aided by effective use of the knife. An excellent choice for an all-purpose bush knife is the Swedish “Mora” style. The basic design has been in use throughout Scandinavia for centuries. Mora is a Swedish town known for producing high quality steel. The single bevel allows great control in woodworking, which is the essential task in wilderness living and survival skills.

A carbon steel blade can be maintained to a shaving edge with wet-dry sandpaper, whetstones or river rocks if necessary. Carbon steel is a superior choice over stainless for two reasons; first, it is *much* easier to sharpen and holds an edge for a long time. Second, the back of the blade can be used as the striker in the flint and steel fire method. The blade of the knife is rather small at about 3 to 4 inches in length. A reputable maker of the low cost, plastic handled variety is Mora of Sweden.

This style of knife allows the user to split wood, cut notches and fell small trees with great efficiency. Wearing the knife on a cord about the neck, you will always be aware of its presence. It



is much more efficient to use in this position and more difficult to lose. When traveling, the knife is tucked into the shirt.

The old saying goes; “If you must carry only one tool into the wilderness, it should be a well-chosen axe.” From a strictly survival standpoint, this is probably still true in the remote bush country of the Boreal forest. But most general, non-winter survival can be accomplished with only a knife and saw. There are times and situations, particularly in Montana’s winter mountains however, where an axe could save your life. Also, axemanship is a culturally important discipline that should be conserved and propagated in the appropriate circumstances.

A good size for general work is a 24-inch long handle with a two-pound head. While it is heavier and somewhat less versatile than the knife, its durability and prodigious felling and splitting qualities make up for it. The axe is also the most dangerous object in the woods. You should read up on proper use and find a mentor if possible. The best commercially available axes, hands down, are made by Gransfors-Bruks of Sweden. They are light, beautiful and hand-forged.



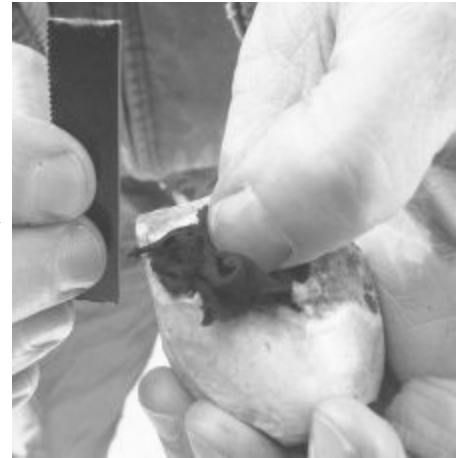
The bow saw or Swede saw is an excellent complimentary tool to both the knife and axe. It is safe to use and accomplishes certain tasks quicker than the other tools. It is also the most fragile and if the blade breaks, it is essentially useless. A bucksaw can be quickly manufactured in the woods with easily found materials. One need only carry some nuts, bolts, saw blade and cord.

Please remember; **all tools require regular maintenance and regular practice.**

Tool Use Notes:

Fire:

Our teaching experience has shown that the majority of backcountry travelers are not competent fire makers. If all else fails, your equipment, the weather, your sense of direction, it is still possible to emerge unscathed from a wilderness emergency if you master basic fire craft. Fire, like all other skills, must be practiced constantly and in varying environments and conditions. One should always carry at least two means of fire making into the woods. Generally matches in a waterproof container and either the flint and steel method or the “spark rod” are chosen.



Again, regular practice with different methods in all weather conditions is necessary to maintain competent fire skills. One should also understand the burning properties of local woods, different tinder and kindling materials and how to reclaim a fire site after use. Obviously in winter, wildfire danger is rather low but in other seasons it is important to develop a sensitivity as to what the wildfire risk is.

If one's life is at stake, the survivor should stop at nothing to create a large enough fire for heating, signaling or other uses. When using fire in other capacities however, one should take additional concerns into account. Is the area heavily visited? Above timberline? Are there any special ecological issues? Is there an abundance or overabundance of fuel? These questions should be asked and answered honestly when using fire in the forest.



Shelter:

The most basic forest shelter consists of a tree with a dense configuration of boughs. This combined with a good fire in front may keep you drier and warmer than a shelter hastily built in the fading light of day. If you have packed a lightweight tarp in your kit for use as a windbreak or you make one of natural materials, a “shelter” as this may be all you need.

For more inclement weather or a longer stay in the bush, one should master the lean-to. This shelter can be constructed in a couple of hours in most forest environments. Its main disadvantage is that a substantial fire must be maintained to keep the occupant warm. Still, even in bitterly cold conditions, this shelter has saved lives.

In certain circumstances a snow shelter like a quinzee or snow cave may be an appropriate survival option. However, at other times, these shelters could threaten your life. Several things are required to produce a good snow shelter; snow, digging tools, time, energy and insulation.

Constructing snow shelters is strenuous work. Remember, sweating greatly reduces the insulation value of your clothing and is an insidious problem in winter. Without a sleeping bag and thick ground insulation, you may very well perish from hypothermia in your snow hut if you are adequately chilled.

Keep in mind that the temperature in a snow cave without a heat source is only a “balmy” 20-32 degrees. Even if this is warmer than the outside ambient temperature, it won’t matter much if you are soaked from sweating and in direct contact with the ground. Contact with the snow will conduct remaining body heat away from you at an astonishing rate. Most cases of hypothermia occur in the 40-50 degree range. Generally speaking, it is a better idea to head for the forest and build a large fire for winter survival.



Signaling:

An under-rated and under-practiced skill set is that of signaling for help in the wilderness. A simple signal mirror is likely more reliable than a cell phone in the mountains. High quality ones are either glass or very high density, reflective plastic. The only downside to the mirror is that it may break if crushed and that it requires a sunny day to operate. But when conditions are right, the flash from a tiny signal mirror can be seen from *twenty miles* distant.

Another very effective means of signaling is the signal fire. A properly built one can produce a thick column of smoke in minutes that can reveal your position to rescuers even if you are deep within the forest. This is definitely the way to go in circumstances when a signal mirror simply will not do.



Notes:

Bindcraft:

You will likely not understand how important some kind of cord is until a need arises and you possess none. It is possible to manufacture cordage from natural materials such as grass, stinging nettle, some willow barks and dogbane. While this type of cord can be very strong and versatile, it will probably not be available when you need it. It is therefore best to carry your own and know how to use natural materials as a backup.

The best kind of synthetic cord is 550-parachute shroud line. This is the actual material used in military parachutes and is composed of an outer sheath and seven inner cords, which in turn are made up of still smaller filaments. By removing the outer sheath, the inner strands can be used for a multitude of tasks such as: snaring/trapping, sewing, dental floss, fishing line, etc.



There is a huge diversity of uses and applications for rope and cordage in the wilderness. The knots and bindings for bushcraft differ somewhat from those of other outdoor pursuits. One should know how to tie and use the following knots: the bowline, single and double sheet bend, trucker's hitch, constrictor knot, taut line hitch and the jam knot. The classic resource is the *Ashley Book of Knots*. There are many excellent newer books and videos available as well.

Plants and Animals:

Hunting and trapping for food is really the last thing a “short-term” survivalist should worry about since the “average” healthy adult can survive at least a month without food. In winter though, food plays an important role in keeping the body warm so some form of **high carb/high fat foods should be carried as part of the survival kit**.

Subsistence is more a concern when training for longer-term wilderness survival. But it is difficult to imagine a situation or place south of Canada that you couldn't walk out of in more than a few days. However, subsistence trapping is legitimately studied by those interested in traditional skills, lifeways and cultures. I also believe the taking of animal life is a humbling experience and can bring about a more intimate and even spiritual relationship with the land, one that cannot be achieved in any other way.



The two mammals often found in relative abundance are the western red squirrel and the snowshoe hare. Simple pole snares and lifting snares can be made and set with very little effort. The cord used in both can be either wire or natural cordage.

A person living exclusively on snowshoe hare for more than two weeks may die because the meat contains almost no fat. This was known as “rabbit sickness” (nephritis) and was relatively common in the Boreal North during the aboriginal and frontier past. Our bodies require fat to metabolize protein and there is simply not enough in the muscle meat of snowshoe hare and other small game. Native people dealt with this by eating nearly the entire animal; brains, bones, hide and all. Fishing can be productive in winter if there is open water or if you can get through the ice.

Remember, if you expend more energy in food gathering (or any other activity) than you take in, you will die sooner than you would have if you had rested, fasted and waited for rescue.

Some easily gatherable plants (during winter), which make a refreshing and vitamin rich tea, are rose hips, conifer needles and Labrador tea. There are few other edible options in the winter time. The use of edible and medicinal plants should not be taken lightly since individuals can react differently to any given species. The study of nature is greatly enhanced by knowing which plants provide sustenance and medicine should the need arise. It is best to find a reputable teacher and well-sanctioned books if you wish to pursue the craft.

Survival Kits:

Nature favors the prepared. A well-assembled kit can give you a decisive edge against a range of unpleasant experiences from a true survival situation to a miserable night lost in the woods. It is important to understand that the kit must reflect the physical and psychological attributes of its user as well as the environmental conditions in which it is to be used.

If you are out of shape and inexperienced in bushcraft, a kit that resembles a standard backpacking rig complete with tent, stove, food, water purification and sleeping gear might not be unwise to carry. Generally speaking, the more experienced the user, the lighter the survival kit. Master woodsman Mors Kochanski of Alberta likes to say, “The more you know, the less you carry.” An advanced practitioner’s kit may consist of nothing more than good sense, a sturdy Mora knife and an assured means of fire lighting. All other components of survival like shelter, cordage, water, first aid, etc., are gotten from the land itself.

A more middle of the road approach will increase the weight of a kit somewhat, but the return in comfort is very high. **I absolutely do not recommend purchasing a commercially assembled kit from an outdoor shop!** These kits are virtually useless and may in fact be dangerous because of the false sense of security they create. When building a winter survival kit, again, ask yourself what you might really need and would be willing to carry to spend a couple of nights out in the cold.

Some general ideas for kits relevant to Montana’s mountains in winter are as follows:

-Two Mora-style knives. They weigh next to nothing and take up little space. A good knife makes hundreds of tasks easier. Some fine grit sandpaper or a small whetstone is useful for



sharpening. One may choose to add other tools like a small axe or the components to make a full-sized bucksaw. (You will therefore not be disappointed if you are caught in a situation where you must fell, buck and split a prodigious quantity of fuel!)

-Two methods of fire lighting. A person must be fluent in two methods of fire if they spend time in the winter wilderness. If matches are your main method, you should know how to use all of the locally available kindling materials as well as feather stick making. If matches become wet or damp, they will never work even after drying out. ***You must carry them in a watertight safe that can be easily opened with numb fingers.*** A backup method like flint and steel or the zirconium rod should be carried. It may be wise to carry one on your person and one in your survival kit, just in case you are separated from the kit.

-A pot for cooking and heating water. This may be large enough to contain the entire kit or be as small as a good-sized metal coffee cup. A pot of some kind is a very important kit component, especially in winter. Trying to heat water, melt snow or cook without one can be challenging to impossible in the winter environment. I carry a lightweight, stainless steel water bottle that can be used as a pot if necessary.

-Tarp, reflective “blanket” and/or sleeping bag. A small military surplus poncho is remarkably compact and can be configured in many ways as a shelter, used to haul materials or worn as a shell. A reflective survival-type blanket is often a flimsy affair, but actually does reflect some radiant body heat back to you. It can be used alone or as part of a shelter. Carrying a sleeping bag as part of a winter survival kit may not be very macho, but it will almost certainly save your life. For people

less willing to maintain excellent fire skills and who may be more occasional users of the winter backcountry, it is entirely appropriate to carry a sleeping bag, just in case.

-Signal mirror. Worth its weight in gold for alerting search and rescue as to your position, it is also useful in helping one remove dirt or grit from the eye.

-First aid kit. Mostly what should be packed here is enough material to stop bleeding from a serious knife cut. An antibiotic ointment, needle and thread and pain reliever are also useful. All wilderness travelers should have at least good working knowledge of basic first aid. Stay away from aspirin if possible, because of its tendency to inhibit clotting of blood; not what you want to deal with when trying to stop serious bleeding.

-Navigation. Good navigational abilities are a prerequisite for wilderness travel. If you choose not to carry a map, you must have a good sense of the area in which you are traveling and your compass skills should be impeccable. Like all of your kit components, it is useless to carry a compass if you do not know how to use it.

-Cordage. The best cord to carry in a kit is 550-parachute shroud line. Most good outdoor shops carry it and it is vastly superior to impostors like “Paracord”. Look for the seven inner strands. A hank of about fifty feet should be adequate for all your needs.

-Food/Subsistence. A few candy bars or a bag of your favorite gorp will lift your spirits and give your body a needed boost in a survival situation. For a winter survival kit, you should add more foods with a higher carbohydrate and fat content. Don’t succumb to the temptation of eating this store of food unless in an emergency. Some packets of cocoa or tea are also morale builders and weigh very little. Some thin snare wire (picture wire) and a fishing kit (line, flies, lures, hooks, bait) is the way to go if you decide to pack subsistence gear. A small container of salt is very useful should you catch fish or small game.

-Miscellaneous. Extra sunglasses are a good idea to pack. Also, the newer LED headlamps are very small, light and last a very long time before having to replace batteries. In most deeper snow conditions a snow shovel becomes an essential item. Never rely on a cell phone: they can break, die and create a false sense of security. The same goes GPS units. ***Please note that you should check your kit components regularly since they will wear out, rot or break, even sitting in the bottom of your pack (Entropy being one of the laws of the universe). Matches especially, should be replaced every six months or so with a fresh supply.***

-A Lick of Sense. It is ironic but true that individuals who make survival skills a part of their outdoor repertoire rarely run into an emergency because they have become acutely sensitive to *avoiding dangerous situations before they develop*. After analyzing survival episodes over the years, risk experts have determined that it is frequently a series of smaller, seemingly insignificant events that culminate in a wilderness emergency. This is what a potential survivor must guard against. While some catastrophic failure of gear or weather event may still catch you unaware, it is important to develop a keen sense of self-preservation by caution.

Wear adequate clothing, become a proficient navigator, carry high quality equipment and practice your survival skills on a regular basis. In short, be humble and know what you are doing!



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